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THE refusal of the Reading receivers to permit the examination of the company's books by an expert on behalf of a number of the bondholders has rather an unpleasant air, and the committee who requested the examination will do well to carry out their determination to appeal to the court and insist upon their right of access to the books.

THE latest naval armor tests at Indian Head have developed nothing especially new, but have served to emphasize the previous testimony in favor of nickel-steel armor. The last tests made were of nickel-steel plates furnished by the Carnegie and Bethlehem companies, and they proved to be fully up to the standard, though neither earned the premium offered for superiority to the requirements of the contract.

THE Seven Stars Mine of Arizona is again in trouble and it seems probable that it may give rise to a scandal of great dimensions. We are informed from Prescott, Ariz., that the wages of the miners have not been paid, that the mine is practically closed down and that there is even some talk of the original owners taking possession, for it appears the mine has not been paid for by Mr. Warner or the Seven Stars company. It is very important that the company should explain and right matters without delay.

ONE strong evidence of the entire unreasonableness of the public in times of panic or semi-panic is the fact that in the recent slump caused by the decline of silver the stocks of gold mining companies went down sharply in price and to almost the same extent of those of the silver mines. A little calm consideration would show that there is every reason why gold mining stocks should appreciate in value as the silver stocks depreciated, but no one seems to have stopped to think about the matter.

OUR friends in favor of free coinage can take it for granted that the capitalists and investors of practically the whole country outside of the few States that together have a total population about equal to that of New York City, are neither fools nor knaves. They understand the interests of capital thoroughly, and when they are unanimously opposed to free coinage, it might naturally lead those who are shrieking for it to have some doubts as to their own omniscience and wisdom. The worst enemies of silver are the free-coinage advocates.

THE Denver meeting refers to the large investments made by Eastern capitalists at the West—in fact it was largely Eastern and English capital that secured the great and rapid development of the Western mining industry. Why, then, should not Eastern capital be entitled to its opinion? Do the free coinage advocates know better than the Eastern investors what will be safest for their investments? Yet the East is practically unanimous—much more so than is the West on the other side—in demanding the unconditional repeal of the Sherman act.

THE Denver address states that every ounce of silver produced in Colorado has cost and is costing \$1.29; but every one knows that the market price of silver during the past 20 years has never reached anything like this figure, and last year was only 87½ cents. Now, why should they make such a fuss over closing this industry that has been losing money for 20 years, if their statements are true, or if they believe them. And how has it come about that the production of silver has steadily and enormously increased if it has always been a losing business? Such statements simply make people smile, and when the actual cost is stated none will believe it.

TIMES and conditions are certainly very hard for our silver-producing friends, but they are not assisting their course by the frothy utterances and the threats which some of them have indulged in at the meetings held in Denver and elsewhere. Such wild talk, in fact, is much more likely to prejudice against them many who otherwise would be rather inclined to take their part. In this connection it may be noted that the miners on the iron ranges of the Lake Superior districts are suffering almost as much from low prices and diminished output as those of the Western silver camps, but we do not hear from them any such wild language or extraordinary plans as have been indulged in among the silver men.

THE trunk line managers have recognized, after some delay, that the travel to Chicago would not rise to the expected volume on full rates, and have finally adopted excursion rates giving the traveler practically half fare, with a limit of 10 days in time. The trains open to these low rate tickets will not include the special fast or "limited" trains, but those run at fair speed only, the trip from New York to Chicago taking 30 hours. As they do not run sleeping cars, which will render them rather unpopular, the roads have rendered these concessions in rates as little use as possible.

THE "Committee on Information and Courtesy" of the American Society of Civil Engineers have prepared a neat hand or pocket book for the information of foreign engineers visiting this country during the continuance of the Columbian Exposition. It contains a map of the United States and list of public works, railroads, mines and manufacturing estab-

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lishments which might be of interest to visitors. The handbook is convenient in form, and has much condensed information, and if the lists are not as complete as they might be the fault is probably not so much with the committee as with managers and engineers who failed to respond to the requests for information. Perhaps the most useful part will be the list of local associations whose members will be ready to help in directing and assisting the visitor.

SOME of our English contemporaries are disturbed at the extent to which orders for mining machinery and supplies from South Africa and other English colonies are going to the United States. They will not, of course, admit that this result is due to any superiority in American machinery, but urge upon the English manufacturers that it is due to their lack of enterprise in advertising and in pushing the claims of their machinery. *Money and Trade*, for instance, says that, "English manufacturers have almost ceased to advertise except in obsolete publications which circulate mainly in the United Kingdom, and to our disgrace be it said, there are now many American firms whose machinery is nearly as well known in London as that of the very best English houses." This, it may be said, is an enforced tribute from a somewhat unwilling source to the excellence of our American manufactures. There is no doubt that mining machinery better suited to the needs of the South African and Australian mines can be had in this country than in England, and the mining operators there are beginning to realize the fact.

THE meeting of the American Institute of Mining Engineers which will begin in Chicago July 31st ought to be an interesting one, not only from the presence of many foreign engineers, but also from the number and value of the papers to be read and discussed. At this meeting the Institute will form one section of the General Engineering Congress, but most of the meetings will be in the mining section, and the real work will be practically independent of that of the Civil and the Mechanical Engineers' associations, which will form other sections of the Congress.

While the work of this meeting promises to be exceptionally good in quality, in one respect it is likely to fall short. The number of members in Chicago will be large, but it will perhaps be expecting too much of human nature to look for a large attendance at the daily meetings, when the many attractions of the great Exposition itself are close at hand. To all but the very few whose time is not limited, the opportunity of studying the exhibits will doubtless seem of more importance than joining in discussions, especially as a meeting comes around much oftener than a World's Fair. If light attendance and brief discussion are the rule, the reason must be considered quite a sufficient one.

THE MEXICAN GOLD AND SILVER RECOVERY COMPANY, LIMITED.

This company has recently been organized in London with a capital of £200,000 in £1 shares, to acquire and to operate in Mexico the patents obtained by Messrs. MAC ARTHUR-FORREST for the use of cyanide of potassium in the lixiviation of gold and silver ores.

To the Gold and Silver Recovery Syndicate, Limited, of Glasgow, the parent company of the many incorporations organized to operate the MacArthur-Forrest patents, £145,000 are to be given, of which £25,000 are in cash, £50,000 in fully paid shares, and the balance, £70,000, wholly or partly in cash or fully paid shares at the option of the company. To raise the purchase price and to provide working capital 175,000 shares are now offered to the public.

In both the ENGINEERING AND MINING JOURNAL and the MINERAL INDUSTRY we have shown the absolute lack of novelty in the MacArthur-Forrest process. There is not a single feature of it which is not old and previously patented. That the Gold and Silver Extraction Company of Denver, operating these patents in the United States, has recognized this we have no doubt, else it, like any company secure in its rights, would have obtained an injunction against an Arizona mine which is now using the cyanide process, utterly disregarding the claims of the MacArthur-Forrest Company for royalty.

One adverse decision and the process would be thrown open to the country, while now the company has some basis for persuading miners to pay, in some cases at least, the exorbitant royalties demanded. The rate of royalty asked is, we are told, different, in different cases.

That Messrs. MAC ARTHUR-FORREST have obtained Mexican patents is of little weight. The Mexican patent office is not noted for thorough examinations, but there can be little question that if a case affecting these patents were brought before the Mexican courts, which contain many able jurists, they would be declared invalid.

For what is it then that the English investors are required to pay £175,000 down with the possibility of £25,000 more of stock being turned upon the market? The prospectors says that the business of the syndicate in Mexico is to be turned over to the newly organized company, and an addendum to the prospectus gives a certain number of cablegrams from the manager in Mexico, which, without mentioning the name of the mines, states that certain contracts have been entered into to treat varying amounts of ore and tailings. Disregarding the question of the

validity of the MacArthur-Forrest patents, it may be asked what quantity of ore capable of being successfully treated by the cyanide process can be found in Mexico?

To our knowledge, in the present state of the gold mining industry of Mexico, there are few properties whose ores can be treated directly by cyanide. To treat silver ores or tailings is out of the question, and operations must be confined to gold ores or tailings of purely gold ores or of alloyed gold and silver ores. On tailings from the latter class the Pan-American Company is now working in Minas Prietas, Sonora, and with some success; but experiments on the ores of the Creston-Colorado, a neighboring property, have not been successful. Of the particular class of ore which is being treated successfully at Minas Prietas there is unfortunately little in Mexico.

Nor are the tailings usually saved; they are generally allowed to accumulate on the creek beds, from which place they are washed by the first freshet. With few exceptions there are no large deposits of auriferous tailings in the Republic, so that, to earn interest on the capital and to return the original investment to the shareholders, new mines of this particular class of ore must be discovered. Whether the advent of cyanide will afford this stimulus for the Mexican prospector, who has been indefatigable for centuries to discover large deposits of this peculiarly desirable class of ore, is an open question.

So far as we can see, therefore, this "Mexican Gold and Silver Recovery Company" has been organized rather with the object of "extracting" gold from the English stockholders than from Mexican ores.

THE DECLINE OF THE MINING STOCK MARKET.

The time is within the memory of living men—and young men, at that—when the mining stock market was a factor of some importance in financial circles, and when speculation in mining shares was a favorite pursuit with all sorts and conditions of men in the United States. It does not seem very long ago when a census would have shown that there was scarcely a village from the Atlantic to the Pacific and from the Great Lakes to the Gulf which did not number among its inhabitants several stockholders of mining companies popularly supposed to own and operate mines of some description "somewhere out West." The stock of such companies was offered daily for sale to investors whose purse-strings were loosely tied, and daily did these "investors" exchange their good dollars for gorgeous stock-certificates. To the reminiscently inclined those good old days are full of retrospective interest. The glowing promises of the "promoters" most eloquently set forth in their prospectuses, when considered as pieces of "fine writing," have never been excelled, not even in these days of sensational newspaper articles and paid "write ups." They would be models of literary workmanship.

As samples of veracity and logical reasoning they may have been somewhat deficient, but for picturesque and persuasive eloquence, for inciting and effective appeals to the pockets of the public they were entitled to rank among the literary masterpieces of the world. They dwelt at length upon the "strong probabilities of finding a second Comstock upon the company's property"—which the guileless investor took to mean that a fine opportunity was philanthropically offered to him to become as wealthy as the bonanza kings of the great lode. The unreasoning cupidity thus aroused blinded him to everything else; the hook was so cunningly baited that in nine cases out of ten it was swallowed.

In the course of time, however, he learned to regard with suspicion every piece of paper that bore the words "mining company" on its face. He had been duped so often that he grew to think that all mines were "wild cats." If he heard of a company which paid regular dividends he was certain that the money came not from rich pockets in the mine, but from the more easily worked pockets of the stockholders. And so it came to pass that "mining investments" became, to some extent unjustly, a synonym for a form of gambling in which the "outsider" stood but little chance of winning. Thus it has become difficult to "float" a new mining enterprise; promoters now go to capitalists, and do not so frequently as formerly appeal to the smaller investors.

We have referred above to those persons who to a certain extent bought mining shares as an investment, or who, at least, thought that the mine under consideration might become productive. But there was another class, probably the legitimate offspring of the first, who bought mining stocks as hundreds to-day buy railroad stocks or lottery tickets, as a speculation pure and simple—an acknowledged gamble. They cared not whether the company's mine was likely ever to prove rich, or, indeed, whether the company owned any mine at all. They desired only the advance or the decline of the stock itself, a series of fluctuations in prices by which they might profit.

Those were idyllic times when "lamb"—the "tenderfoot" of Wall Street—abounded and scarcely could be kept away from the delusive pastures of the mining exchanges. Then mining brokers flourished and prospered; they waxed corpulent upon the innocent lambs. The times are changed now. The memory of numberless fleeces shorn in those self-same idyllic times frightens the lambs away from the old pastures. No longer are

their fleeces offered for shearing, and the mining broker has lost the gay insouciance of his palmy days; he sits in figurative sack cloth and ashes, mourning for the days that are no more and complaining that prosperity no longer attends him.

It was a case, to express it popularly, of "big dog eat little dog"; the big operator manipulated the market, the small dabbler in stocks rushed in and contributed his mite, and—lost it! Again and again was this done, until the "mites" were all gone and purse-strings tightened. The exchanges protected its "patrons" from highway robbery, murder and a few other well known statutory offenses, but not from what is euphemistically called the "shrewdness" of the operators. The ENGINEERING AND MINING JOURNAL flatters itself that it has ever been the enemy of all fraudulent mining ventures which have come to its notice. It has been its good fortune again and again to be the means of placing its readers on their guard against well-planned schemes of the class of speculation which has in a great degree brought about the unpopularity of mining stocks as an investment. We cannot recommend a better plan to those who are intending to invest their capital in mining companies than to read the ENGINEERING AND MINING JOURNAL weekly.

NEW PUBLICATIONS.

OUTLINES OF FORESTRY: BEING A SERIES OF PRIMERS OF FORESTRY. By Edwin J. Houston. Philadelphia: The J. B. Lippincott Company. Pages, 254.

This book begins with a general definition of forestry, which is followed by chapters on conditions necessary to growth of plants and trees; distribution of forests; influence on their growth of soil, climate, rainfall and other conditions; reciprocal influence of forests on climate, health and agricultural conditions; formation of soil; causes of the destruction of forests and the results; reservations and tree planting, and the renewal of the forests.

It will be seen that the book attempts to cover a pretty wide field in a general way. Its great defect is a sort of machine-made, written-to-order air which is apparent all the way through, and in this it resembles many other books of the same kind. It contains, however, much information on a subject of importance, and has the advantage of saying in convenient form many things which ought to be generally known, but which have been difficult to find; and it may in this way do good service.

LES SCIENCES EXPERIMENTALES. Par A. Badoureaux. Paris, France; Ancienne Maison Quartier, May & Motteroz, Directeurs. Pages, 268; illustrated.

This volume was written as an introduction to a series treating of the various branches of science, both theoretical and practical, and it is necessarily of a very general character. It is divided into five parts, the first being introductory and giving a definition of the meaning and object of experimental science and of the atomic theory which the writer considers as the basis and beginning of all investigation. The second part treats of the states or conditions of matter, and the third of natural phenomena, their causes and results. The fourth gives the conclusions reached, and the fifth and last the application of experimental to industrial sciences.

In this general summary the object has been rather to define and to indicate the present condition of science than to put forth any new theories; to show what science has thus far learned and what it teaches of the properties of matter in its varying forms, and to point out, necessarily in a very general way, the lines which must be followed if we wish to utilize those properties for the benefit of man. The field to be covered, according to the plan of the book, was so extensive that the author was not able to enter into any extended demonstrations or to discuss controverted points, and he has limited himself to the statement of facts or of probable hypotheses in his definitions, his object generally being to state these as plainly and clearly as possible. He has given in one or two places, however, some theories of his own, especially in classifying the conditions of matter; on the constitution of solid bodies; on the action of gases, and on terrestrial magnetism.

M. Badoureaux's style is clear, and he has the disposition to generalize and classify in which French scientific writers excel. The book is a good introduction to a scientific course, and gives an idea of the general progress and position of physical experimental science which could hardly be obtained from any special study, even though we may be inclined to take issue with some of the author's conclusions.

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.

The Story of Malta. By Maturin M. Ballou: Boston and New York: Houghton, Mifflin & Co. Pages 320. Price \$1.50.

Records of the Geological Survey of New South Wales. Volume III. Part 3; 1893. Sydney, N. S. W.; Government Printer. Pamphlet; 40 pages; illustrated.

Geological Survey of Texas; Report on Grimes, Brazos, and Robertson Counties. By W. Kennedy. Austin, Texas.; State Printers. Pamphlet; 84 pages; illustrated.

Forest Influences: Bulletin No. 7 of the Forestry Division, Department of Agriculture. B. E. Fernow, Chief of Bureau. Washington; Government Printing Office. Pages, 200.

Zeitschrift für das Berg Hütten und Salinen-Wesen im Preussischen Staate; XLI. Band. Zweite Heft. Berlin, Germany: Issued by the Ministry of the Interior. Pages 188; with atlas.

Proceedings of the Rochester Academy of Science. Part 2, Volume II. Edited by Arthur Latham Baker, Secretary. Rochester, N. Y.; Published by the Society. Pamphlet; 83 pages; illustrated.

Fifth Biennial Report of the Inspector of Coal Mines of the State of Colorado, for the Years 1891 and 1892. John McNeil, State Inspector. Denver, Colo.; State Printers. Pamphlet; 26 pages; with tables.

Second Annual Message of Edwin S. Stuart, Mayor of the City of Philadelphia: with Reports of the Department of Public Works and the Bureau of Surveys for the Year ending December 31st, 1892. Philadelphia; Published by the City. Pages, 176.

The Electric Transmission of Intelligence and Other Advanced Primers of Electricity. By Edwin J. Houston, A. M. New York; The W. J. Johnson Company, Limited, 41 Park Row, London: Whittaker & Co. 1893. Pages 330; 88 illustrations. Price, \$1.

Handbook to Publications and Documents Connected with the Rise and Development of the Railway System Chiefly in Great Britain and Ireland. Compiled by S. Cotterell. Birmingham, England; Edward Baker. Pamphlet; price (in New York), 40 cents.

CORRESPONDENCE.

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

The Metallurgy of Nickel

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Replying to the letter of Mr. Edwards Vaughn, published in your paper of July 8th, permit me to state that patents have been granted in Great Britain, covering the several points involved in the Orford method of separating nickel from copper and iron, and similar patents have been granted by almost all other foreign nations. That the Hafod Isba works employed salt cake as a flux in their treatment of nickel-copper mattes in times past I do not question, but that they have used a process similar to that employed by the Orford company I doubt; otherwise a product similar to that sold by us would have been on the market long before this. My friend, Mr. Merry, the superintendent of the Hafod Isba works, is one of the most capable metallurgists living, and I have no doubt he would long since this have developed a process similar to ours, if it had not been that he has had other processes more suitable to his conditions.

ROBERT M. THOMPSON.

NEW YORK, July 10, 1893.

Variations in the Milling of Gold Ores.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Mr. John A. Church's letter, referring to the Harrietteville mill, suggests several points for consideration. I shall hope that Mr. Thos. G. Davey, the manager for the Harrietteville company, will see Mr. Church's letter and give his views upon the subject. In the meantime may I add a few words.

The reason for using finer screens in front than at the sides is the desire to equalize the volume of discharge. Your correspondent's remark appears to be just. In using the end discharge the intention is, I believe, to cause an even distribution of the pulp over the amalgamating tables whose excessive width is in turn rendered serviceable by the use of the end discharge. The suggestion that a plate 6x8 ft. might be better than one 4x12 ft. seems to be very sensible. The plate should be as wide as, if not slightly wider than, the screen discharge. As a rule the mortar opening exceeds 4 ft. If the amalgamating table is much wider than the discharge it will be found hard to obtain an even distribution of the pulp. The other extreme is, however, more common. Too often the plates are less wide than the discharge. Quite recently I measured these dimensions in a certain mill and found the former to be 2 3/4 in. less than the latter. The result was that along the sides of the amalgamating table there was a decided eddy due to the confinement of the flow of the pulp to a space less wide than that through which it had issued from the mortar. The increased force of the current thereby caused was certainly prejudicial to the arresting of the gold.

In all milling the sooner the gold is caught the better; therefore, a table which is wide, but over which the pulp is evenly distributed, and which, therefore, arrests the gold early in its career over the amalgamated surface, is to be preferred to one less wide, but longer, whose gold-saving is continual for a greater distance from the battery. An amalgamating table is rarely too long. It is poor economy to have it even a little too short. An old plate can generally be sold for more than its first cost, and therefore any supposed economy in this direction is to be avoided.

Returning to Mr. Church's reference to the Harrietteville mortar. I do not wish to be understood as generally recommending the use of the end discharge, though I did desire to point out wherein the method of using it at Harrietteville was better than the way in which it had been tried elsewhere in the colonies. The ore of the Harrietteville mines is easy to crush, and the gold it contains is readily amalgamated. I certainly believe that if the mill were equipped with rock-breakers and self-feeders of approved design, if the mortars were of the ordinary front discharge type, if the stamps were a little heavier, fell more rapidly and for a less distance, the capacity of the mill would be enormously increased without any serious diminution in the extraction of the gold.

DENVER, Colo., June 27, 1893.

T. A. RICKARD.

"The Mineral Industry" for 1892.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Many thanks for your promptitude. The "Mineral Industry" is a statistical gem and beats everything I ever saw in its line.

HENRY T. COLLINS.

Manager New Torreon Silver-Copper Mining Company, Limited.

ESTACION TERRAZAS, Chihuahua, Mexico, June 6, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Allow me to congratulate you upon "The Mineral Industry." It is the best and most complete work of its kind that has yet appeared,

and will take rank as the leading book of reference. I am advising all my clients and friends to provide themselves with copies.

STEPHEN H. EMMENS,
The Emmens Metal Company.
YOUNGWOOD, Pa., April 24, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I have read your latest statistical compilation, "The Mineral Industry," with great pleasure, and can readily understand why its appearance was made at a time rather later than in years gone by. The contents are more interesting than ever before and must prove of great value to the trade and people generally who are at all interested in metals. Certainly there is no other book that is so valuable in the same line.

J. LANGELOTH,
President American Metal Company.
NEW YORK, April 20, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I have taken the time to examine my copy of the "Mineral Industry" for 1892, lately issued. I find it to be the most thorough work of its kind ever attempted in the domain of mining and metallurgy, embodying as it does the present status of all branches of metallurgical art, written, too, with a careful and conscientious regard to technical details, which alone can render such writings valuable to those practically engaged in the production of metals and other products of mining. No one engaged in mining or metallurgy or expecting to be so engaged can afford to be without it. It is just what it purports to be, a correct photograph of the present state of the entire mineral industry of the world, and I have already referred to it a dozen times upon points which I was uncertain of or had forgotten, and I prize it as one of the most valuable of my reference books, for I find it completely filled with important information which one often wants in a hurry, and not to be obtained from any other easily accessible source.

C. W. STICKNEY
NEW YORK, June 10, 1893.

EDITOR ENGINEERING AND MINING JOURNAL

Sir: After a close examination of those parts of the book of which the subjects are familiar to me, viz., coal, coke, iron and gold, and finding them correct, full, and complete, I have come to the conclusion that the other parts must be equally so. Taking into consideration the enormous mass of raw material which had to be worked over in editing this book; and thinking of the time in which it has been done; looking at these two together it becomes very hard indeed to avoid hyperbole in speaking of the performance. To prove its practical value, I cannot do better, perhaps, than to give an actual occurrence which happened to me last fall. I approached a gentleman who I knew was willing, nay anxious, to enter into the manufacture of a certain metallurgical article, for the needed capital; I was asked to prepare a statement as to its history, present condition of market, cost, wages, etc., etc. After a great deal of trouble and losing a month's time, I made the statement, but the matter fell through. In a personal interview later, I found that my man had the slightly unreasonable notion that such information should be at one's fingers' ends; had I then had "Mineral Industry" the result would, no doubt, have been different.

F. KOERNER,
Mining Engineer.
WILKES-BARRE, Pa., May 22, 1893.

The Dewey Refining Process for Sulphide Precipitates.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The "Journal" of June 10th contains two interesting letters, one from Mr. Morse, of Aspen, Colo., and one signed by the Dewey-Walter Refining Company, in which charges and counter-charges are made that are not convincing one way or the other to the reader. With the priority of invention I am not concerned, but I am interested in the process itself. I would like to know how it came that the Dewey-Walter Refining Company issued a prospectus stating that its process was in successful operation at the Park City refinery, when, in fact, the process was in a rather primitive experimental stage at the time when these circulars were promiscuously distributed. As to capacity, the original plant was a misfit and could not handle one-half of the regular sulphides produced by the Marsac mill.

The prospectus says "no refining charges"; but the silver bars so far produced were not salable as refined silver and had to bear refining charges. No attempt has as yet been made to produce fine gold.

With the economy of the process the Marsac mill is not concerned so long as the Dewey-Walter Refining Company lives up to its contract, namely, to produce refined bars at a charge of 1¼ cents per fine ounce, and to return all the silver and gold contained in the sulphides as per "corrected" assay. Whether the Dewey-Walter Refining Company will be the gainer or loser remains to be seen.

OAKLAND, Cal., June 15, 1893.

C. A. STETEFELDT.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In your issue of June 10th, under the above heading, you publish a letter from the Dewey-Walter Refining Company, in which they answer my letter of April 29th, by telling about what Mr. Walter told Mr. Russell and what Mr. Godshall told Mr. Walter, etc., etc., and then tell about what this company is trying to "rob" them of. A comparison of the dates as given in my letter throws a little light on the subject of who is trying to do the "robbing" in this case, and needs no further comment. Mr. Dewey in his letter says "dates of applications do not establish dates of invention; otherwise there would be no call for interference proceedings." In the case of the application of Mr. Godshall no interference proceedings were declared with the Dewey application, notwithstanding Godshall's application was filed July 25th, 1892, and Dewey's not until Sept. 8th, 1892, and the patent was issued to Dewey in January, 1893. While I contest Mr. Dewey's claim to the invention of the sulphuric acid method of treating sulphides, no one can question

the fact that he has invented or discovered a method of getting a patent through the Patent Office without interference, and in very quick time, notwithstanding the fact that another application was filed months prior to this.

I am under the impression now that both Mr. Godshall and Mr. Dewey are a little behind in this matter, as only a few weeks ago Mr. Alexander Schneider, director of the Deutsche Gold und Silber Scheide Anstalt, Frankfurt-on-the-Main, Germany, visited this State, and in conversation with the writer stated that they had used the sulphuric acid method of refining sulphide precipitates, which they received from Mexico, in their refinery at Frankfurt for several years, and solicited the shipment of sulphides from our mill to be treated by that process. He also stated that the process was a success commercially, as they manufactured their acid as a bye-product and at a very low cost. The refining works referred to are, I believe, among the largest in Europe, and were established by the well known Dr. Roessler. I presume it will now be in order for Mr. Dewey to accuse the German refining works of "robbing" him, as that seems to be his favorite method of answering facts that do not suit him.

As to the success of the Dewey-Walter company at Park City in the use of this method of refining I am not interested, but hope that when they have made a clean-up there (and I understand from Mr. E. H. Russell that up to ten days ago no clean-up has been made), Mr. Dewey will publish the results as to consumption of acid, time required to produce the silver, fineness of bars, percentage of silver recovered, as well as cost of treatment, in support of his assertion that the process is a success commercially at that point. When this is done it will be in order for Mr. Dewey to talk about "proper technical and business management."

This company will be very glad to enter into a contract with Mr. Dewey to refine the sulphides produced here at 1¼ cents per ounce of silver, and he can use any process he may see fit, and we will furnish him the free use of complete plant for the sulphuric acid method, and also purchase his blue stone at market rates; other conditions the same as published details of his contract with the Daly company.

WILLARD S. MORSE,
General Manager Holden Smelting and Milling Company.
ASPEN, Colo., June 24, 1893.

Sapphire in Iron.—M. Henri Moissan found in a specimen of the iron of Orifak which was submitted to him sapphires, amorphous, carbon, sprouting graphite and ordinary graphite.

Antiquity of the Hot Blast.—It would seem that the hot blast is nearly 3,300 years old, for the researches of Mr. F. J. Bliss at Tel-el-Hesi, the site of the ancient town of Lachish, so he stated at the meeting of the Palestine Exploration Fund in London on June 6th, have resulted in the disclosure of an iron blast-furnace, so arranged as to give strong evidence of being intended to heat, in its descent, a blast of outside air forced through passages, before entering the chamber at the level where tuyeres are usually found. "If this theory be correct," says Mr. Bliss, "we find 1,400 years B. C. the use of the hot-air blast instead of cold air, which is by most people considered quite a modern improvement in iron manufacture." After all, it seems, men were not quite so ignorant 'down in Judaea' as is popularly imagined."

Utilizing Heat from Furnace Slags.—Some experiments have recently been made at Broken Hill, New South Wales, with apparatus devised by John Howell and E. A. Ashcroft, for utilizing the heat from furnace slag for raising steam. The boiler consists of a steel shell in the form of a strong, egg-ended receiver, having flattened faces on the top and bottom. Through these flat portions a number of Galloway tubes, arranged in two rows, tapered from 5 in. at the top to 10 in. at the bottom, are passed and secured to the shell by flanges. The lower or larger end of each tube is closed by means of a cast iron door, which is manipulated by means of a convenient lever. The upper end of each tube is provided with a funnel for convenience in pouring the slag into the tubes, and a pair of iron rails pass across the upper face of the boiler and over all the funnels and thus serve as a track for the slag pots. At each end of the boiler a bin is provided, into which is dumped the skin of the slag, which always sets on the cast iron pots from which it is poured, and this red-hot material lying against the ends of the boiler plates serves to conserve the heat at the same time and impart additional heat to the water. Beneath the lower end of the tubes a railway track also passes, on which runs a truck for removing the slag after the heat has been extracted from it. In connection with the machine now working, a handy form of hydraulic lift is utilized for the purpose of raising the slag to the upper portion of the boiler. In actual practical work, however, it is contemplated sinking the boilers to the level of the slag dump and removing the slag after treatment by means of a truck, running to the edge of the dump, along a line laid in a specially prepared cutting. The boiler being filled with water to the required level the slag is poured into the tubes one at a time just as it comes from the furnaces. As soon as all the tubes, which are 24 in number in the machine now at work, are full, the tube first filled is emptied by merely releasing the lever which controls the door, and a conical cast of cool slag drops into the truck below which is provided for its reception. The operation is continued with the various tubes, and as soon as the truck is loaded it is conveyed to the edge of the dump by means of horse or some other convenient power and tipped over. As the tubes are emptied they are filled with molten slag, and in this manner the work is conducted continuously. This operation in itself is considerably less laborious than the method now adopted of wheeling the pots of hot slag by hand-power for a great distance before tipping them over, a work that is particularly arduous during the warm summer months.

The tests so far made have been successful, steam being kept up without trouble, and no injurious effect on the tubes from the slag being apparent.

MANUFACTURE OF IRON IN INDIA.*

The former attempts to start the pig iron industry at Beypore, Nerbudda Valley, Chanda and Kumaon were, as is well known, unsuccessful. Railways are now, however, opening up the mineral resources of the country, and the prospect of coal mining, as well as iron working, becoming large industries is yearly improving. The supply of coal is rapidly increasing. In 1881 there were 47 collieries open; in 1890 the number had increased to 82, and the output increased from 997,730 to 2,168,520 tons. The most successful effort to produce pig iron is at Barakur, on the East Indian Railway. The first attempts were financially unfavorable and the promoters found themselves unable to continue their operations. The works were then taken over by the government, who, after keeping them up for a time and turning out 8,000 tons of pig iron per annum, re-transferred them to a company which was formed in 1889, under the name of the Bengal Iron and Steel Company, with a capital of £150,000. One condition of the lease was that the plant should be so improved and extended as to insure an output of at least 15,000 tons of pig iron per annum. Since the works have been taken over, the two blast furnaces have been re-constructed, and a new one 60 ft. high has been built. This furnace is producing close upon 2,000 tons per month. When the three furnaces are at work they will be able to produce from 45,000 to 50,000 tons per annum. The fuel used is coke and anthracite coal, in about equal proportions, and both

MINING AT THE COLUMBIAN EXPOSITION.

Specially Reported for the Engineering and Mining Journal.

THE RIFE AUTOMATIC HYDRAULIC ENGINE.

The problem of an economical water supply, which is one of the greatest interest, particularly where it has been impracticable to use steam or electrical power, has long been a matter of study. An invention which claims to solve this problem is the Rife automatic hydraulic ram. The ram presented here has a capacity of 300 gallons per minute, but they can be built of greater power. They are especially adapted for use in irrigation, placer mining, railroad water tanks and the smaller needs of country residences. The peculiar advantage of this ram is its simplicity of mechanism and absence of wearing parts, rendering it durable. In the sectional cut (the air chambers being removed) the lower section, or base, of the hydraulic engine is clearly shown; also the double-acting attachments, and connections for properly delivering the spring water into the ram, that it alone may be forced in a pure condition by the power of the creek or river water to any desired place. The spring water is conducted through the spring-supply pipe M and check valve O (which prevents its return), and is delivered into the base B, directly under the delivery valve L, which, being removed, shows the open end of the pipe from which the spring water flows, filling the entire elevated portion of the base with spring water, down to the place where the creek or river water discharges through the escape



THE RIFE HYDRAULIC ENGINE.

are available in abundance. The flux is not so easily obtainable, the quality of the limestone in the immediate neighborhood of the works being inferior, and that used has to be brought a long distance at considerable expense; but hopes are entertained that, by further explorations, this difficulty will be overcome. Foundries for the casting of pipe and railroad ties have been constructed with all the appliances adopted in similar works in England. During the three years ended October 1st, 1892, the works have yielded 8,433, 8,420 and 10,046 tons per annum respectively. In the present year it is expected that 25,000 tons will be produced. The quality of the iron is reported to be good, and the "Bengal pig" has become popular. The East Indian Railway Company has been using 300 tons per month in the manufacture of cast iron sleepers, and other railways have taken 200 tons per month. There has also been a demand for pipes, of which 4,000 tons were cast last year, and the satisfaction of the Chief Commissioner of the Central Provinces, Sir A. P. MacDonnell, was expressed at the manner in which the company had executed a contract for the Rapiur Water-works.

The Momignies Iron Mines.—The Momignies iron mines, on the Franco-Belgian frontier, have again been started; they date back from the days of the Romans, but for the last 10 years have not been worked owing to a dispute between the proprietors.

*Abstract of a paper recently read before the Society of Arts on "The Manufactures of India: Their State and Prospects," by Sir Juland Danvers, K.C.S.I.

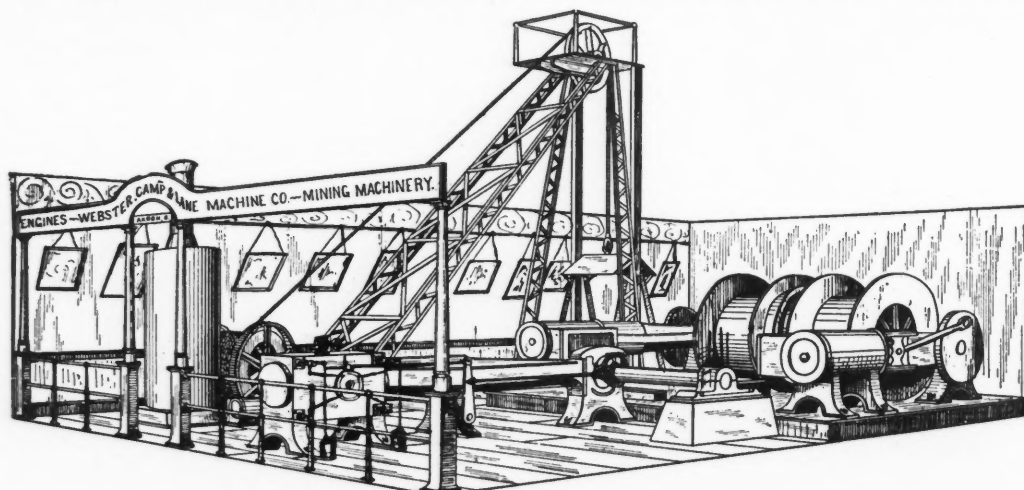
valve G, so that when this valve closes the entire force of the moving column of creek or river water through the drive pipe is exerted upon the spring water, driving a portion through the delivery valve L into the air chamber J, whence it is discharged through the pipe P to any required place. When the creek or river water has expended its force and recoils, a new supply of spring water promptly follows, replacing the portion just driven into the air chamber, ready to be forced by the repeated action of the creek or river water. The spring supply pipe M is provided with an overflow pipe N, through which the spring water may momentarily escape when the check valve is closed, thus preventing any check or stoppage in the flow of water from the spring, being always ready to enter the ram, and promptly follow the creek or river water the moment it recedes.

THE WEBSTER, CAMP & LANE MACHINE COMPANY.

We present herewith a drawing showing the exhibit of the Webster, Camp & Lane Machine Company, of Akron, O. This is handsomely installed and occupies a space of about 3,000 sq. ft. It is situated next to the Michigan State exhibit in the Mines and Mining Building. This company's specialty being heavy machinery for the transportation of ores and coal from the mine to the earth's surface, it was hardly able to do justice to it, as the space would not permit. However, the company displays a large main and tail rope haulage machine; a complete hoisting outfit for small mines, and an "Akron" Corliss engine. Attractively displayed about the pavilion are photographs of the large hoisting plants built by the company for the Hamilton Ore Company at

Iron Mountain, Mich. These plants are now being used in hoisting the water out of No. 2 mine by means of buckets 6 ft. in diameter and 40 ft. long. Photographs of the hoisting plant built by this company for the Granite Mountain Mining Company, of Montana, are also displayed. This plant shows engines of a combined capacity of 900 H. P.,

The complete hoisting outfit for small mines includes a combined portable hoist and boiler of 25 H. P. capacity, which appears unusually heavy and well proportioned for its size. The boiler has enough capacity to run a small mine pump in addition to the hoist. The head frame is of steel 20 ft. high, and the safety cage is also of steel. This



and is one of the most complete mining plants in the West. Photographs of the four-drum plant of the Lake Superior Iron Company and of the special tandem compound engine for the Bessemer electric light station are also exhibited.

plant is in complete running order, and the operations of hoisting, landing and lowering, as performed by means of a hand friction-clutch, are shown on request. The Akron Corliss engine, while apparently out of place in the Mining Building, really represents the style of engine which the company recommends for all large mining plants to be run on the most economical basis. The engine is supplied with a governor which controls the speed absolutely while a load is being hoisted, a result not obtained in practice heretofore.

The exhibit of this company is in charge of Mr. Franklin Moeller, M. E.

THE AMERICAN WELL WORKS EXHIBIT.

The well-sinking machinery here illustrated was used for the largest and deepest well known in alluvial deposits, which was sunk in a remarkably short time. The well referred to was sunk by J. W. Byrnes on Galveston Island, in Texas, and was sunk to a depth of 3,067 ft. It was sunk for experimental purposes. The same contractor also sunk an 8-in. well 810 ft. in 36½ hours, and a 12-in. well 833 ft. in 81 hours. In one case 556 ft. was sunk in eight hours. Standard wrought iron pipe, screwing together with sleeve couplings, is used for the wall of the well and the tube to bore with. A shoe (Fig. 2) having a saw tooth is put on the bottom length, which is set up and put into the revolving machine, as shown by Fig. 1. A hydraulic water-swivel is connected to the upper end, having a hose which conducts the water to the swivel, Fig. 1; it is set on the floor of an ordinary derrick of the usual form, which extends up high enough to put up two lengths of pipe, about 40 ft. As the tube is caused to revolve, the machine is so arranged that the tube is gripped to be turned, then the vise grip which holds it turns to allow the pipe to go down; as the tube descends and the earth is cut away a stream of water forced down inside the well tubing washes the dirt up on the outside of the tube, and at the same time keeps the bank from caving against the tubing and bending it. When the first length of pipe has been sunk, other lengths are added, but before being raised in the derrick other water connections are put onto the tube, so that when it is ready for connection the joint can be made in about fifteen seconds, and the water continues to run down. For penetrating beds of quicksand and caving material, the water simply holds the sands from caving against the tubing, and allows it to be sunk to any depth without hindrance. It is also suitable for boring the ordinary strata of rock. In boring through earth or sand a jumping appliance is provided which raises the drill slowly and drops it quickly when boulders are met that the rotary drill would not cut. This machine is equally suitable for prospecting; to take out a core for examination a diamond drill may be

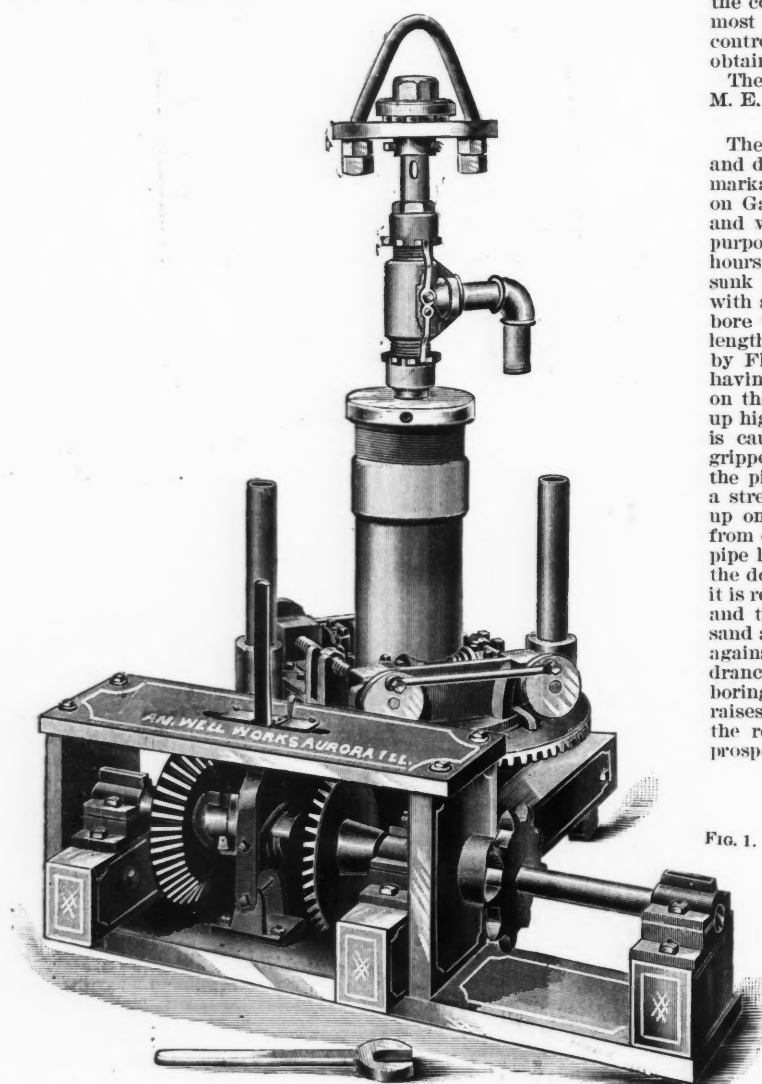


FIG. 1.

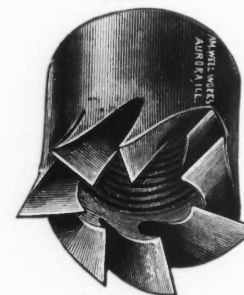


FIG. 2.

THE AMERICAN WELL WORKS EXHIBIT.

The large main and tail rope haulage machine has 20 x 32-in. balanced slide valve engines and 5-ft. drums, fitted with the company's well known make of friction clutch. It is operated by a steam cylinder controlled from the platform by means of a hand lever. There are brakes for each drum, also operated by hand levers, as is the throttle. The combined power of these engines will move a train of 50 heavy mine cars loaded at a rate of 1,000 ft. per minute on any ordinary level track.

used in the place of the saw-toothed boring tool. At the Sulphur mine in Louisiana, Capt. John A. Grant, an engineer of note, late general manager of the Texas Pacific Railroad, with one of these machines took out several cores, and fully tested the mines. The apparatus has been used for several years, and gives excellent satisfaction. The process was invented and patented by the Chapman Brothers, and the machinery is manufactured by the American Well Works, of Aurora, Ill.

THE KENTUCKY STATE EXHIBIT.

In January, 1893, Kentucky appropriated \$100,000 for her representation at the World's Fair. Of this amount \$15,000 was set aside for the mineral exhibit of the State. The pavilion devoted to this in the Mines Building is very attractive, as coal has been entirely used in its construction. The entrance to pavilion consists of a Gothic arch entirely of cannel coal, massive in its proportions and architecturally one of the most novel ideas in the entire building. Kentucky's space is 23 ft. by 61 ft., and every available foot of space is used to illustrate the State's mineral resources. A portion of the floor is composed of tiles donated by the Kentucky Construction and Improvement Company, of Mayfield. A relief map (scale 1 in. = 4 miles) confronts those entering the pavilion. It shows the economical geology, particularly the eastern and western coalfields. In the exhibit no attempt has been made at mere display, but it shows that Kentucky has spent her money well. Every county in the State has its representation; some sand salt, mineral waters, petroleum, ochers, kaolin, cement rocks, hydraulic limestone; others coals and iron ores of every description, making in all a total of over 1,000 samples. On the left of the pavilion are found coals



COAL ARCH—entrance to Ky. Exhibit

KENTUCKY

COLUMBIAN EXHIBIT

Department of Mines and Forestry, Chicago, Ill.

from the western fields, comprising over 5,000 square miles and containing 12 separate and distinct coal horizons, the principal seams of which are represented by columns 2 x 2 ft. The eastern coalfields are represented on the right. They comprise an area of 9,000 square miles, and contain 10 or 12 workable horizons, with seams ranging from 24 to 108 in. in thickness, and composed of superior steam, domestic, gas and coking coal. Kentucky is said to have the largest known area of cannel coalfields now being energetically worked, the two most prominent mines of this coal being the White House and Breckenridge companies, of Louisville. The "Mineral Industry" for 1892 gives the total production of bituminous coal in the Appalachian and central coalfields from 1870 to close of 1892 as 1,188,730,482 tons. Of this amount Kentucky contributed 30,796,506 tons, representing a value at the mines of \$30,796,506. In 1870 the output of the State's coal mines was to the square mile 10.7 tons, but in 1892 a large gain is shown from the fact that it had increased to 215.7 tons.

Kentucky's total area of bituminous coalfields is a trifle over 14,000 square miles, and the amount of capital now placed in same exceeds \$7,000,000. The industry gives employment to 5,790 men, and as new mines are being constantly opened and old companies expanding, the number of employees is rapidly increasing.

The eastern coalfield has an elevation of from 650 to 4,000 ft. One

seam, the Elkhorn, runs from 6 to 9 ft. in thickness and covers many square miles, and is a fine coking coal. The western coalfields have an elevation of from 400 to 900 ft., several of the mines producing coal that makes excellent coke. The following table shows statistics of yearly products since 1872, the output each year being given in tons:

1873	336,000	1880	1,120,000	1887	1,933,000
1874	403,200	1881	1,132,000	1888	2,342,059
1875	500,000	1882	1,456,000	1889	2,205,415
1876	738,000	1883	1,548,000	1890	2,483,144
1877	952,000	1884	1,736,000	1891	2,916,000
1878	900,000	1885	1,904,000	1892	3,026,218
1879	1,120,000	1886	1,550,000		

The full output of the State for 1892, as given by Mr. C. J. Norwood, chief inspector of mines, was 3,026,218 tons, divided as follows: Western district, bituminous, 1,720,120; southeastern, bituminous, 839,638; northeastern, bituminous, 412,618; total bituminous, 2,972,375 short tons; cannel coal, 53,842; total, as above, 3,026,218 short tons. The statement given in the "Mineral Industry" for 1892, which was in some part estimated, was 3,020,060 tons. The corrected statement thus shows a difference of less than 1-5 of 1% from the estimate.

An attractive addition to the exhibit is a model of the famous Mammoth Cave. It is situated under the Mines Building, and is nearly 500 ft. in length. The entrance is from the rear of the Kentucky exhibit, and is reached by descending a flight of steps. The cave is V-shaped, thereby enabling a continuous stream of visitors to pass through at all times. The entrance is very dark, but at intervals electric lights are so placed as to afford one an idea of the model cave. Stalactites by the hundreds hang from the roof, and to the walls are hung myriads of crystals, quartz, etc. Pictures illustrating the original cave are hung from the walls, and the guides explain the more interesting of them. At the further end of the gallery is a crystal grotto; over the grotto limewater trickles, showing the process of stalagmite formation. In a pool of water near by are numerous fish. They are the eyeless fish of the Mammoth Cave. Overhead myriads of stalactites glisten from the gleam of electric lights. From light to darkness, darkness to light, and so on, the visitors go until once more they are at the entrance, having seen a bit of Kentuckian enterprise.

A New Method of Shot Firing.—Mr. James McCoy, colliery manager, and Mr. Adam Deane, colliery agent, both of Little Lever, England, have invented an improved method of shot firing, which provides for the safe recovery of the detonator and explosive charge after a misshot, for the prevention of blown-out shots, and for the suppression of all flame. A block or wedge is inserted in the shot-hole with the cartridge before the stemming, and is connected by two tubes to the exterior. By means of these tubes the shot-holders become full of water, which surrounds the cartridge. This water extinguishes all flame on the firing of the shot, and the tubes provide means whereby the electric connecting wires pass from the interior to the exterior, and also by which the cartridge can be safely and easily withdrawn in case of a misshot.

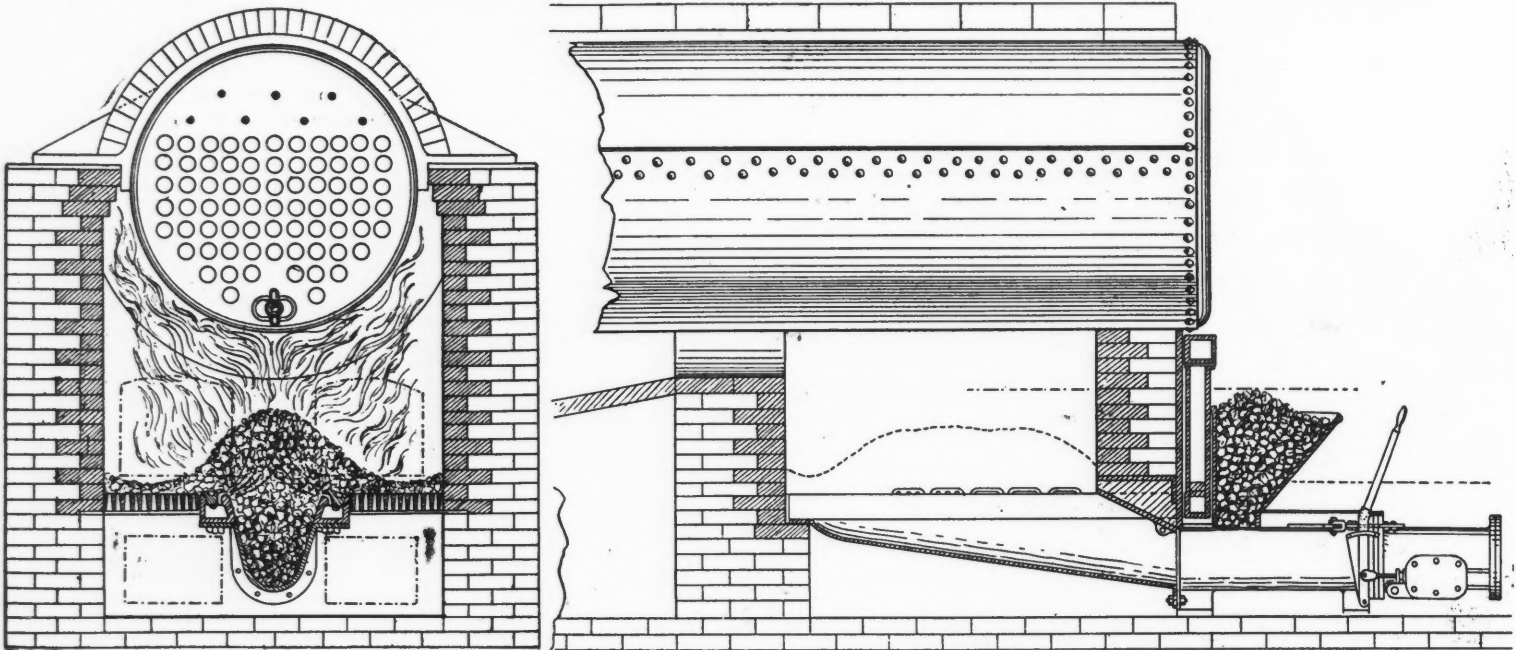
A New Sensitive Barometer.—While pursuing some researches necessitating the determination of very slight variations of barometric pressure, Dr. Carlo del Lungo constructed a barometer of high sensibility which should be of great use in coal mines. According to the description given in the "Rivista Scientifica Industriale," the apparatus consists of a vertical tube, 20 millimetres in interior diameter, and about 1 millimetre in length, the bottom of which is curved in the ordinary manner, the opening at the top, however, being furnished with a steel peg screwed in an iron collar attached to the tube. A long capillary tube, 1 millimetre in diameter, is fixed at right angles on the large tube, a little above the curved part, and terminating in an open receptacle. The quantity of mercury is regulated so that the meniscus of mercury presents itself in the middle of the capillary tube. The slightest difference of atmospheric pressure will cause the mercury to rise and act on the capillary column. A fall of pressure is indicated by the inverse movement of the column. In this way the increase or decrease of the mercury in the large tube is augmented according to the section of the tubes, and in this case as 400 is to 1. A variation of 1-400th of a millimetre can therefore be noted.

Mining Royalties in the United Kingdom.—The Royal Commission appointed in 1890 to examine into the question of mining royalties in the United Kingdom have just made an extended report of their investigations. Briefly stated the conclusions arrived at were as follows: 1. That the amount paid as royalties on coal and metals worked in the United Kingdom in 1889 was £4,665,043, and the charge for way-leaves in the same year about £200,000. 2. That the system of royalties has not interfered with the development of the mineral resources of the United Kingdom or with the export trade in coal with foreign countries. 3. That the terms and conditions under which these payments are made are, generally speaking, such as to require interference by legislation; but the Commission recommends that some remedy should be provided for cases in which a lessee may be prevented, by causes beyond his own control, from working the minerals he has taken, and also for cases of certain restrictions upon the assignment and surrender of mineral leases. 4. That, where the surface belongs to one person and the subjacent minerals to another, greater facilities should be provided for the working of the minerals. 5. That greater facilities should be afforded to tenants for life of settled estates in dealing with mineral property. 6. That facilities for granting mineral leases for longer terms should be given to corporations and public bodies in certain cases. 7. The Commission recommends for the favorable consideration of Parliament any measure which may be introduced, with the concurrence of all parties concerned, for dealing with mineral leases in Cornwall and Devon, and also that the Department of Mines in the Home Office should be reorganized and extended with such additional statutory powers as may be necessary for the purpose of collecting and publishing accurate information with regard to mines and minerals.

THE JONES FURNACE AND MECHANICAL STOKER.

We present herewith illustrations of the Jones underfeed mechanical stoker, a new device for the economical burning of fuel. In this the fuel is fed from beneath the fire, instead of on top, as is the case in hand firing or firing with other mechanical devices. It is the invention of Mr. E. W. Jones, of Portland, Oregon, whose experiments cover a number of years, the results of which are shown in the present machine. It is simple in construction, having a fuel chamber or retort in the furnace, below the line of the fire, forming a supporting bottom, sloping upward and backward from the supply opening, and with flaring sides, forming a magazine for the fresh or green fuel. In connection with this is a ram operated by a plain steam cylinder and valve (all outside of the furnace), by means of which the fuel is forced into and through the retort. The retort is provided with tuyeres on either side on top, through which the air is introduced by means of a pressure blower. Upon either side of the tuyeres ordinary grates are placed.

To operate the device the retort is first filled with coal level with the tuyeres; fire is then started on the side grates as usual, until steam is raised, ashpit doors are then closed, and the hopper outside is filled with coal. By means of the steam ram the coal is then forced up and into the retort. Air is admitted through the tuyeres by the slots shown in the cut, which air passes over the green fuel in the retort, but under and through the burning fuel, no combustion taking place below the point at which the air is introduced. The result is that the heat from this burning fuel or coke liberates the gas from the fresh fuel in the retort which naturally rises, and, coming in contact with the air, is mixed with it and passes up and through the incandescent body, the result being a bright, clear flame, free from smoke. By this method the coal is first thoroughly coked before it reaches the fire proper, thus utilizing all the combustible matter in the fuel.



THE JONES FURNACE AND MECHANICAL STOKER.

All the fuel is practically burned on top of the retort and the tuyeres, thus giving no chance for the fine particles of either coke or coal to fall through the grate bars and not be consumed. The incoming fuel bed from underneath crowds the ash and clinker on the side grates, from which they can be removed from time to time as may be necessary, without in any manner interfering with the fire proper. The furnace is practically a gas producer placed under a boiler, all the gas being consumed as fast as it is formed and while at a high temperature. From the fact that no green coal ever reaches the fire there is always a mass of incandescent coke and flame nearest the absorbing surface of the boiler. The furnace is under perfect control of the operator at all times, and a large body of coke may be carried in the furnace, the consumption of which is governed by the amount of air forced through it, which air is regulated at the will of the operator as more or less steam is needed.

The patents covering this device are owned by the Jogada Furnace Company, of Portland, Ore., which has recently opened an Eastern office in Chicago. A number of these machines are in operation on the Pacific coast with much success. Tests at the plant of the Portland Cable Railway showed a saving in fuel from $24\frac{1}{2}$ to $27\frac{1}{2}$ %.

A machine has recently been installed in the plant of Fraser & Chalmers, of Chicago; tests made there showed an increase in water evaporated of 42%, indicating a saving in fuel of about 30%.

One reason for the great economy claimed is in the exceedingly low temperature of the uptake. Owing to the fact that the proper quantity of air is forced into the furnace, the stack temperature is always kept at a very low point, a high temperature in the stack to create the necessary draft in the furnace being necessary.

In the plant of the Edison Light and Power Company, San Francisco, a large number of tests have been made to ascertain the stack temperature, and while an average pressure of 165 lbs. steam is carried, an average stack temperature of 450° was shown.

Nearly all kinds of bituminous coals have been used with this device. With lignite, which in many instances has failed to produce

good or even fair results by hand firing, a saving of about 27% has been made in a test covering 30 days.

It is claimed to be particularly adapted for the burning of fine coal or screenings, owing to the fact that there is no loss through the grate bars and that the proper amount of air can at all times be diffused through the furnace to produce perfect combustion.

SOME NOTES FROM TASMANIA.

Written for the Engineering and Mining Journal by Dr. E. D. Peters, Jr.

The Mount Lyell mine is situated in the western part of the island of Tasmania, formerly the penal colony known as Van Diemen's Land, and in as wild, rugged and isolated a country as even an American mining engineer would care to see. A century and a half ago old Admiral Tasman, of the Dutch Navy, sighted this unknown island, and describing two lofty summits rearing their heads above a host of smaller peaks, named them after his two vessels, Mount Zeehan and Mount Heemskirk. Many years passed before the English took possession of the island for use as a penal settlement; and though the silver-lead veins of Zeehan and the tin lodes of Heemskirk no doubt cropped out as boldly in those days as they do at present, yet they offered no inducement to the wretched naked Tasmanian native, who was probably the only human being who was capable of sustaining life in the impenetrable jungle that chokes every valley and gorge on this western coast, and clothes even the mountain sides with a mass of green boughs that will often support a man for a distance of 100 yards or more, until he slips on some treacherous branch and quietly drops into the mossy cavern 20 ft. below, with scarcely a chance of ever seeing the sunlight again unless he has companions to come to his rescue. The horrors of the west coast navigation are so supreme

that I cannot pretend to give the slightest idea of them. A rainfall of 120 in. per annum—I have seen it rain 32 days without two hours' cessation—and a warm, muggy atmosphere give rise to a vegetation that can only be paralleled by the forests on the north bank of the Congo that Stanley had to cross in his Emin Pasha expedition. I will simply say that, with the worst obstacles removed by a couple of axemen ahead, I have been two hours in making a quarter of a mile through the scrub, and two hours of such exertions as I never care to repeat. This impassable and utterly foodless vegetation acted as a complete barrier to escape on the part of the convicts. But as the more fertile parts of the island became cleared, and a new race of respectable settlers grew up, the penal settlement was broken up, and ancient Van Diemen's Land became modern Tasmania, a country of flocks and herds, of fruit and grain, and, above all, of lumber, its forests furnishing on the whole the finest and most varied timber I have ever seen.

But the west coast still remained impenetrable and unsettled, until a slight exploration showed it to contain exceedingly valuable mines, tin and gold, both alluvial and in veins; silver in galena, at Zeehan, and, latest of all, deposits of cupriferous pyrites carrying gold and silver, and but little smaller than the noted Spanish mines, while from three to ten times as rich in the valuable metals.

It is one of these pyrites deposits, the Mount Lyell mine, that I came out to examine, and I hope before long to give you a more detailed description of its peculiarities and undoubted value. At present I can only say that it is a most promising and entirely feasible enterprise, providing sufficient capital is raised to build an 18-mile railroad to the coast; to equip a large smelter, and to open the mine on an adequate scale.

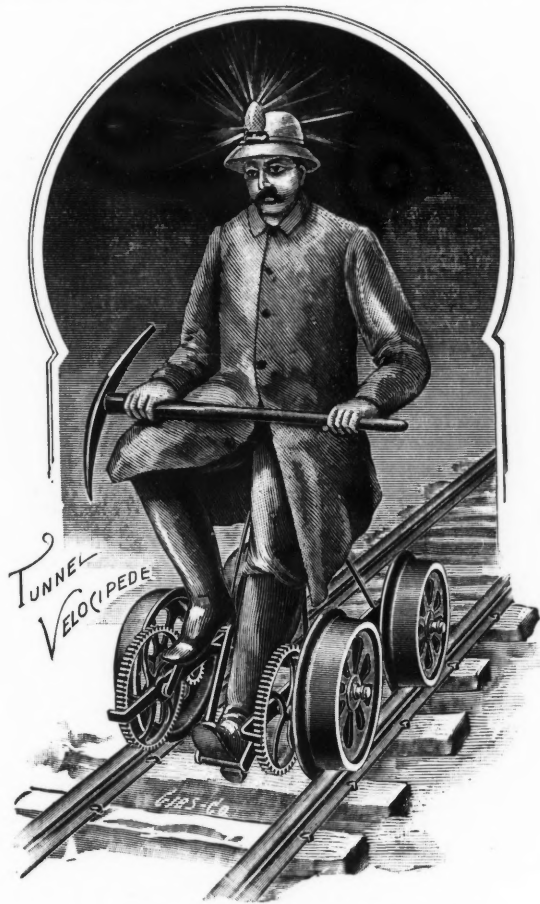
I would like to mention a point that will be of interest to naturalists. Tasmania has a peculiar fauna. Every mammal native to it is a marsupial (pouched); and two of its mammals lay eggs. The platypus, a kind of duck-billed otter with a beautiful fur, and of which I have seen several on the banks of the streams, lays a whitish egg in a burrow,

and hatches it by lying beside it in the nest, the male relieving his mate at intervals. But the porcupine anteater, which also lays an egg, is of a perambulating nature, and has no fixed abode. Consequently, as has been proved by ocular demonstration, the female takes her egg with her lips, places it carefully in her pouch, and "totes" it about with her till it hatches. All marsupials bring forth their young in an extremely immature condition, looking very much as a lump of clay would look if I attempted to model it into the shape of one of their young. The mother takes the newly born embryo with her mouth and places it in her pouch, where it adheres permanently to one of her teats, and, being too young to suck, is nourished by the milk which the mother presses into its mouth by the means of special muscles that surround her breasts.

Although so wet, the climate of Tasmania is extremely mild and healthful, and perfect health, combined with extreme kindness and hospitality on the part of the people, make a stay there both pleasant and profitable.

THE MINE AND TUNNEL VELOCIPED.

The machine shown in the accompanying illustration is designed for use in extensive mines and long tunnels, and every detail of its construction has been most carefully planned and thoroughly tested by two years of continuous work under the most trying conditions. The best material is used in its construction, the frame being of the toughest iron and steel, while the wheels have steel hubs, rolled steel flanges and wooden spokes; the driving gear is machine cut, the crank shaft is hand forged, carefully turned, and carried in brass journal boxes. The seat is of the well known Garford pattern, specially made of extra strength, and adjustable to any height of rider. This velocipede is so small and



BRUNTON'S MINE AND TUNNEL VELOCIPED.

light that it can be lifted from the track with one hand, leaving the other free to carry a light or tools. When seated on the machine there is absolutely nothing in front of the rider, and if the wheels run into a fall of rock or earth upon the track when going at high speed the rider is simply shot forward from his seat, and easily maintains his equilibrium by running a few steps.

On an ordinary track the machines can be comfortably operated at the rate of from 10 to 12 miles an hour, and on first-class track experienced riders can make from 15 to 20 miles per hour with but little exertion.

This machine was designed by Mr. D. W. Brunton, manager of the Cowenhoven Tunnel, of Aspen, Colo., who found after the tunnel had reached a length of over a mile that altogether too much time was consumed in walking to and from the face. The first machine was built in that company's shops, and as soon as it was put upon the track its utility as a time and labor saving device became so evident that the foreman, shift boss and timberman were immediately supplied. The invention was patented, and arrangements made with the Sheffield Velocipede Car Company, of Three Rivers, Mich., for its manufacture. The mineowners and managers in the vicinity of the mine where it was first used were quick to see its advantages, and the car is already in use at no less than ten of the mines about Aspen, including the Cowenhoven, the Bushwhacker,

the Park-Regent and others, and also the Virginius mine and the Revenue Tunnel at Ouray, Colo. Its use will certainly extend as it becomes known.

THE REDUCTION OF PHOSPHORUS IN PIG IRON.*

No metallurgical question that has arisen within the last 40 years has demanded and received a greater share of scientific interest than that of the relations of phosphorus to iron. Not only have metallurgical chemists the world over spent years of labor upon the problems involved, but capitalists, as well, have contributed freely of their wealth to bring the matter within range of commercial possibilities.

For the manufacture of steel, ores are divided into high-phosphorus and low-phosphorus, or non-Bessemer and Bessemer, the limitations of the ordinary processes being circumscribed by the amount of this element present in the ore. Of the 12,000,000 tons of steel now annually produced in the world certainly not less than three-fourths, or 9,000,000 tons, are made of ores that contain, per 100 parts of metallic iron, not more than 0.07 part of phosphorus, so that the steel resulting from the conversion of the pig iron made from such ores does not contain more than 0.10% of phosphorus. Of the other 3,000,000 tons, 2,000,000 are made by the Thomas process from ores that contain from 1.50% to 2.25% of phosphorus per 100 parts of iron, and 1,000,000 from ores that contain from 0.10 to 1.50% of phosphorus per 100 of metallic iron.

All steel making processes, of whatever nature, whether Bessemer, Thomas, open-hearth or crucible, as at present carried out, are based upon the assumption that all of the phosphorus in the ore goes into the pig iron; if there is but a trace or a very small amount present the iron may go to the Bessemer converter, or the acid open-hearth or the crucible for transformation into steel. If on the other hand phosphorus was present in the ore to such an extent as to bring it in the pig iron above 0.10% then the metal goes to the basic open-hearth, or if above 1.50% to the Thomas converter.

The principle common to all of these processes is that there is no opportunity of diminishing the content of phosphorus in the pig iron, as such, that whatever amount of phosphorus goes into the blast furnace in the burden of ore, flux and fuel comes out of the blast furnace in the pig iron, none of it going into the slag. This assumption is so far true that for all practical purposes it may be accepted as entirely reliable under present conditions of blast furnace practice. But that it is not true under all conditions is equally indisputable.

In the article referred to, Mr. Kjellberg, who is a laborious experimenter, has gone over the ground very thoroughly, considering the difficulties attending such work. He set before himself the question of determining whether the temperature or the basicity and acidity of the burden would influence the phosphorus content of the pig iron, whether, in other words, the blast furnace practice itself might not throw some light upon the affinity between molten iron and phosphorus. He employed a small blast furnace in which, however, the temperature of the blast did not exceed 225° C. (= 437° F.), about the melting point of tin, and used five different kinds of ore. The first was hematite with 60% iron and 0.2% phosphorus; the second magnetite with 69% iron and 0.7% phosphorus; the third hematite with 65% iron and 1.2% phosphorus; the fourth magnetite, with 58% iron and 2.6% phosphorus; and the fifth magnetite, with 51% iron and 3.6% phosphorus.

His conclusions are as follows: 1. When the phosphorus content of the ore is not above 1.25% the temperatures, under which he worked, do not influence the phosphorus-content of the pig iron, nor does the amount of silica in the slag. The greater part of the phosphorus of the ore is combined with the iron, only a small portion, 5 to 10%, going into the slag.

2. When the phosphorus in the ore is above 1.25% it begins to enter the slag, and this slagging process increases in intensity with the increasing percentage of phosphorus. Both the temperature of the furnace and the acidity of the slag commence to influence the reduction of the phosphorus, and this action also increases with the amount of phosphorus up to 3.5%. If the ore contains as much as 3.5% of phosphorus, the greater part of this element combines, under all circumstances, with the iron. If, however, the ore-charge be increased and the burden made basic the phosphorus content of the ore may rise to 3.5%, and still 40 to 50% of it be slagged off. With a higher temperature and an acid burden 95% of the phosphorus, already slagged, can be made to enter the iron.

3. No volatilization of phosphorus took place in the blast furnace even with ore containing 3.6%.

4. The carbon-content of the pig iron diminishes with the increase of phosphorus, but is not manifest until the phosphorus rises to about 3%. The pig iron obtained from the ores richest in phosphorus contained only a small amount of graphite and was white, with mirror-like planes on the surface of fracture.

5. The content of silicon varies with that of phosphorus; a sample of charcoal iron with 4% of phosphorus contained no more silicon than steel does. Pig iron containing upward of 4% of phosphorus can be made to take up a few tenths of one per cent. of silicon only by urging the blast and using an acid slag. The pig iron of highest phosphorus was quite brittle, a slight blow of a hammer serving to break a bar into many pieces.

Mr. Kjellberg makes the following practical suggestions: To make basic open-hearth stock with not over 0.6% phosphorus, it is advisable to use 60% ore containing not over 0.4% phosphorus. For cast irons, with phosphorus up to 1%, ore with 60% iron and not over 0.6% phosphorus should be used.

For Thomas iron, with at least 2% of phosphorus, the ore must contain at least 1.6% phosphorus, and 60% iron, as only ¼ of the phosphorus is reduced and enters the pig.

Does all of the phosphorus of the burden under all circumstances enter the pig iron? This question must now be answered in the negative, but whether the results reached are of sufficient importance, com-

*Article by N. Kjellberg in "Jern-Kontorets Annaler," Vol. III., 1892.

mercially, to induce further and more protracted experiments is doubtful. Some years ago, in the flush times at Birmingham, Ala., a company was organized for the purpose of building a blast furnace to be lined with basic instead of acid brick. It was known as the Pratt Steel Company, and was to have been capitalized at \$20,000,000. But money grew scarce and the capitalization was finally put at \$7,000,000. It was understood that \$20,000 of this was subscribed, and that the foundations of the furnace were laid at Cartersville, Ga. But the project failed. It is possible that with a basic lined furnace, a basic burden and a low temperature the phosphorus of the ore may, in great measure, be induced to enter the slag, but we can not believe that this action would go on to such an extent as to make Bessemer pig out of non-Bessemer stock, or to make even a profitable reduction of the phosphorus. When ores contain too much phosphorus for the Bessemer process it is not likely that any blast furnace practice can, on the large scale and with coke as fuel, reduce this to the Bessemer limit, and do it profitably. On the same grounds it may be urged that a reduction of phosphorus in non-Bessemer stock, but not to the Bessemer limit, would have no advantage commensurate with the cost.

The great difficulty in the way of the utilization of non-Bessemer ores for steel making is not in the reduction of the phosphorus in the pig iron, but the silicon. This is the bug-bear, and the question is how to make low silicon iron of ores containing from 10 to 20% of silica and coke with 8 to 15% of ash. If this can be successfully done, and basic open-hearth stock of not more than 1% of silicon be furnished regularly and in large quantities, the phosphorus question will take care of itself.

A Notable Mountain Railroad.—The railroad line across the Andes, which was begun by Henry Meiggs some 25 years ago under the name of the Lima & Oroya Railroad, and which is now called the Central Peruvian Railroad, has finally been completed to Oroya, 30 miles east of the summit of the Andes and the originally intended terminus of the road. Oroya is 136 miles from Callao, and on this line are 13 stations, 10 bridges, two tunnels and four "switchbacks." Five of the stations are over 10,000 ft. above the sea level; one is 13,420 ft., and another 13,606 ft. above the sea. There is a tunnel at an elevation of 15,665 ft., two bridges at over 11,000 ft., and a "switchback" at 12,697 ft. above the sea-level. Oroya is the shipping point for the famous silver mines of the Cerro de Pasco, and now that it is possible

LEAD PRODUCTION OF THE UNITED STATES.*

The accompanying tables give the statistics of lead in this country, the first showing production, imports and consumption for three years, 1890-1892, and the second the production by States for the 20 years, 1873-1892. The production of lead in the United States, which rose from 162,000 short tons in 1890 to 202,000 tons in 1891, increased again in 1892 to 218,500 tons, including 26,734 tons smelted from foreign ores and 12,874 tons of Mexican bullion refined in bond and exported. Of the lead imported in ores and smelted here, all but a small quantity came from Mexico. The production of lead from domestic ores was 178,892 tons, against 178,133 tons in the previous year. Thus the immense output of 1891 was more than maintained, notwithstanding the lower prices of silver and lead, the labor troubles in Idaho, the inactivity among the silver-lead mines in Montana, and the decrease in the

PRODUCTION OF LEAD IN THE UNITED STATES.

	1890.	1891.	1892.
From domestic ores:			
Desilverized	106,980	139,033	142,087
Soft	32,000	31,000	31,000
Antimonial	4,896	5,105	5,805
Total domestic	143,876	178,138	178,892
From foreign ores	18,124	21,162	26,734
Foreign bullion refined, in bond	2,700	2,700	12,874
Total product of works	162,000	202,000	218,500
Imported for consumption	9,975	1,915	.....
Total supply	171,975	203,915	218,500
Exported in bond	.....	2,700	12,874
Stocks, of refined	.....	9,000	5,500
Consumption	171,975	192,215	200,126
In white lead	.....	60,000	64,800
Pipe	.....	35,000	37,000
Sheet	.....	12,500	13,500
Shot	.....	15,000	15,000
Other uses and stock	.....	69,715	25,626

yield of Leadville, Colo. Such a large product as our returns show, in the face of these adverse influences, is noteworthy indeed. It proves that the lead supplies of this country are so many and so large that

PRODUCTION OF LEAD IN THE UNITED STATES.

Year.	Arizona and California.	Colorado.	Idaho, Montana.	Non-Argentiferous. ^b	Nevada.	Utah.	Other States. ^a	Mexico. ^c	Total Domestic. ^d	Grand Total.
1873	.....	56	.....	23,381	.....	15,000	5,103	.....	.....	42,540
1874	.....	312	.....	e23,000	.....	20,000	8,768	.....	.....	52,080
1875	.....	818	.....	24,730	.....	19,000	14,992	.....	.....	59,540
1876	.....	667	.....	26,421	.....	25,000	11,982	.....	.....	64,070
1877	.....	897	.....	31,152	19,724	27,000	3,127	.....	.....	81,900
1878	.....	6,669	.....	26,770	31,063	21,000	5,858	.....	.....	91,360
1879	.....	23,674	.....	28,130	22,805	14,000	4,171	.....	.....	92,780
1880	.....	35,674	.....	27,690	16,659	15,000	2,802	.....	.....	97,825
1881	.....	40,547	.....	30,770	12,826	24,000	8,942	.....	.....	117,085
1882	.....	55,000	.....	29,015	8,590	30,000	10,285	.....	.....	132,890
1883	3,200	70,557	11,000	21,800	6,000	29,000	2,600	.....	.....	143,957
1884	4,300	63,165	14,500	19,932	4,000	25,000	6,000	.....	.....	139,897
1885	4,000	55,000	e15,000	21,975	3,500	23,000	6,937	.....	.....	129,412
1886	e3,500	59,000	e22,000	20,800	3,400	e21,000	5,929	.....	.....	135,629
1887	e3,500	63,000	27,000	25,148	3,400	e19,000	4,164	15,488	145,212	160,700
1888	e3,500	e65,500	e30,000	29,090	2,400	e18,000	3,429	28,636	151,919	180,555
1889	3,200	69,000	32,500	29,258	1,950	16,500	4,989	25,570	157,397	182,967
1890	1,500	54,500	33,000	31,351	2,000	18,000	3,525	18,124	143,876	161,754
1891	2,000	64,000	40,000	34,000	2,500	28,000	7,633	e23,867	178,133	202,000
1892	2,000	61,500	36,500	37,000	2,500	30,000	9,392	h39,608	178,892	218,500

(a) Includes New Mexico, from which State most of the metal credited in this column is derived. Small amounts came from Washington and South Dakota. (b) Nearly all the non-argentiferous lead produced in the United States is mined in Missouri, Kansas, Wisconsin, and Illinois. The statistics in this column, up to 1883, represent the output of these four States solely. In 1883 Virginia produced 200 tons and a small amount annually since that year; a portion of the output of these Eastern States in 1891 and 1892 was marketed as "desilverized," some of it, both in bullion and ores, having been used by the smelters of western "dry" ores. (c) The importation of Mexican lead began to assume important proportions in 1886, but no records of the amount brought into the United States in ores were kept prior to 1887. The figures in this column also include a small quantity of lead imported in ores from Canada, but the amount is trifling. (d) Small quantities of lead were brought into the United States in ores previous to 1887, though no records were kept of the amount. The figures in the column "Grand Total" for the years 1873-86, both inclusive, represent, practically, the domestic production. (e) Estimated. (f) The distribution of output among the various States for 1889 is an approximate one, based upon the figures of the Eleventh Census. (g) Includes 2700 tons of lead imported in base bullion and 21,162 tons imported in ores. (h) Includes 12,874 tons of base bullion brought into the United States, refined in bond, and exported, and 26,738 tons of lead imported in ores.

to secure a supply of fuel by the railroad smelting works have been started at Casapalca and other adjacent places. It is hoped that the railway will be extended, by way of Tarma and Chanchamayo.

An Unprofitable Venture.—The "call" is universally unpopular among stock and shareholders, who not unfrequently prefer that money should pass in quite the opposite direction, says the "Investors' Guardian." A novel mode of protest was that lately used by an honorable proprietor of an Australian gold mining company, who wrote to the Secretary: "Dear Sir: I have your letter, and note that your directors propose to proceed against me. According to your prospectus, one of the objects of the company is to seek, win, and work gold. Things not turning out well, your directors apparently consider it their duty to seek, win, and work gold elsewhere—i. e., out of me. I can assure you, however, that I am not an auriferous vein—the only lode I possess is a load of debt, and as a gold mine I shall be a distinct failure. Your prospectus estimated a yield of 1 oz. per ton on 20,000 tons of quartz crushed per annum. You may crush me, but you will find that I won't yield nearly so much as that, for my person (which for the purpose of this calculation may be considered quartz) weighs, roughly speaking, only about 10 stone. If crushed immediately, I estimate it would yield as under: Gold, nil; silver, 3s; copper, 4½d; bismuth (in an indigestion mixture I am taking), a trace. Deduct cost of crushing, say £5. Yours faithfully, J. B."

the demands of the market can be met easily even when the most important producers are laboring under difficulties which restrict their output.

The amount of ore imported, notwithstanding the tariff, shows also that it is absolutely necessary for our smelters to secure lead ore from foreign sources in order to reduce our own silicious silver ores. The additional cost of this imported fluxing ore was, of course, paid by our silver-ore miners, as is shown in the heavy increase in smelting charges, averaging about \$2.50 a ton on these ores. As an additional object lesson, we have in the amount of bullion refined "in bond" and exported an indication of what our metallurgical industry might do had it free raw materials.

The consumption of lead grows at an enormous rate, especially when the price is low. White lead continues to be the largest single use for the metal, but pipe, sheet and shot are very important uses.

It is in the nature of a coincidence that the domestic production of lead was so nearly the same in 1891 and 1892, for in the latter year there were important changes in the relative positions of the various States. The total production of lead from non-argentiferous ores increased about 3,000 tons, but an important part of this was marketed as desilverized, the ores having been smelted with argentiferous ores from the West.

*From the "Mineral Industry for 1892." Copyright by the Scientific Publishing Company.

A LARGE ELECTRIC LOCOMOTIVE.

The first electric locomotive of any considerable size in the United States, and the first practically operative high speed electric locomotive in the world, adapted to the steam railroad, has recently been completed at the Lynn works of the General Electric Company, and will shortly be exhibited at the World's Fair. It is a 30-ton locomotive, designed for a normal speed of 30 miles an hour, primarily intended for operation on elevated railroads, and for passenger and light freight traffic on smaller steam roads. It is of compact construction, solidly and substantially built, and runs on four 44-in. wheels. Its dimensions are 16 ft. 6 in. long, 11 ft. 6 in. high, 8 ft. 4 in. broad, having its drawbars 2 ft. 6 in. from top of rail. The drawbar pull is calculated at 12,000 lbs.

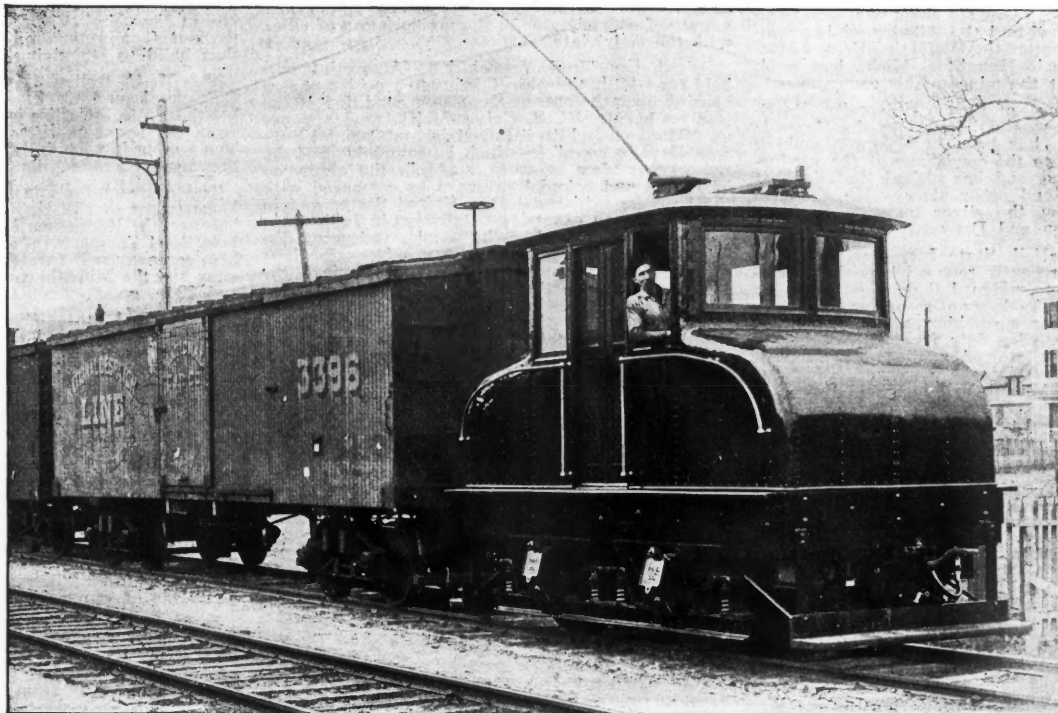
The propelling power is furnished by two electric motors of special design and construction, each axle being provided with one motor. The motors are gearless, and are supported on spiral springs resting on the side frames. This method of suspension leaves the wheels free to adjust themselves to the irregularities of the roadbed, and consequently the wear to both tracks and motors is diminished. The motor fields consist of massive iron castings, to which the hollow field spools are bolted. The armatures are of the ironclad type, having each separate winding imbedded in a mica-lined slot cut into the curved surface of the laminated iron armature body. The axles of the locomotive pass through the hollow shafts on which the armatures are mounted. Those shafts rest in bearings of the motor frame, and are connected to the axles by universal couplings, which allow of freedom of motion in all directions. The commutators are of mas-

view in all directions. There is ample space in the cab for the motor-man's movements.

The air for the brake is supplied by a special electrical air compressor, which also operates the whistles. This air pump has an oscillating cylinder of 6 in. diameter, with a 6-in. stroke, supplying 6,000 cu. in. of air per minute at 70 lbs. pressure. The motor is similar to the N. W. P. 2½ in general appearance, but is wound for higher speed. The normal speed of the armature shaft is 675 revolutions, and of the crank shaft of the pump 110 revolutions. The dimensions of the air compressor are: Length, 41 in.; width, 16½ in.; height, 25 in. The pump motor is controlled by a special rheostat. This, by an intermediary device, is automatically regulated by the air pressure.

The current necessary to the operation of the locomotive will be taken up according to the prevailing conditions. The engraving shows an overhead trolley contact, but, as conditions change, the means of electrical contact would probably be modified, and, instead of a trolley making overhead contact, a sliding shoe and contact with a third conductor rail, as in the case of the Liverpool Elevated Railroad, or the Intramural Railroad at the World's Fair, might be adopted. The roof of the cab will carry the necessary head-lights, as shown in the smaller engraving. The locomotive has already been put into actual operation. The engraving shows it drawing a train of freight cars on the regulation steam track.

International Boundary Surveys.—Prof. T. C. Mendenhall, of the Coast and Geodetic Survey, on the part of the United States, and



30-TON ELECTRIC LOCOMOTIVE.

sive construction, and there are four sets of brushes to each commutator. The motors are controlled by means of a series parallel controller, set up in the interior of the cab. Under test it is found that the series parallel controller allows of a more gradual and easier starting of the electric motor, and the speed can be more delicately

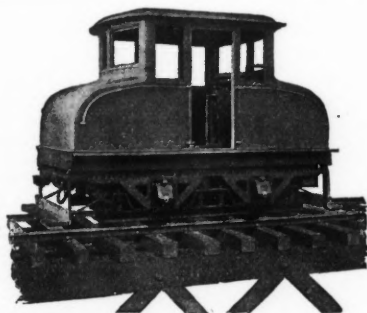


FIG. 2.

and instantaneously controlled than in the case of the steam locomotive.

The frame, suspended from the journal boxes, is constructed of heavy I-beams, and forms the foundation for the locomotive cab, of sheet iron, of symmetrical design, and so curved off as to diminish the atmospheric resistance as far as possible. The interior is finished in hard wood. Two sliding doors are placed at each side of the cab, and the windows are so arranged as to permit of an unobstructed

Commissioner King, on the part of Great Britain, will leave Washington soon to determine which country owns Pope's Folly Island, near the waters of the boundary line between the United States and Canada, off the coast of Maine. The possession of this island has been in dispute for the last century. Professor Mendenhall has discovered that the first chart issued by Great Britain showing the boundary line between the United States and Canada gave the island to the United States, but a subsequent chart included it in Canadian territory. The island might be valuable in case of war.

With this question settled, the only other important boundary dispute between the United States and Great Britain is the determination of the line between Alaska and the British possession. The party which started out last March have been unable to accomplish much. When last heard from, the mountains were covered with snow, and it is not believed the boundary line can be marked for a year.

PATENTS PUBLISHED IN GREAT BRITAIN.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy:

ENDING JULY 1ST, 1893.

- 10,735 of 1892. Production of Sodium Potassium and Other Metals by Electrolysis. H. C. Bull, Liverpool.
- 12,255 of 1892. Ore Breakers. M. E. Villeroz, Schramberg, Germany.
- 12,382 of 1892. Manufacture of Wire and Strip by Electro-deposition. R. D. Sanders, Eastbourne.
- 13,960 of 1892. Apparatus for Skimming Molten Tin in Tinning Operations. D. & B. Jones, Pontardulais, South Wales.
- 14,657 of 1892. Extraction of Alumina from Bauxite. A. Hand and H. Kunheim, Berlin.
- 18,605 of 1892. Manufacture of Briquette Fuel. G. Huttemann, Wiklitz, Bohemia, and G. Spieker, Bonn, Germany.
- 4,215 of 1893. Coke Ovens. O. J. Boult, London (F. J. Collin, Dortmund, Germany).
- 7,783 of 1893. Mine Fans. G. Hanarte Mons, Belgium.
- 9,295-7 of 1893. Electrolytic Soda. T. Craney, Bay City, Mich.

PERSONALS.

Mr. Cecil L. Budd was admitted into the firm of Vivian, Younger & Bond, of London, as a partner from July 1st.

Mr. Edward Shields has been appointed chief electrician in charge of the electrical plant at the new works of the National Tube Works Company.

Herr Friedrich Alfred Krupp, of the great German steel works, is visiting Pittsburg, where he will remain for a week or more while on his way to the Chicago Exposition.

Mr. T. Hawke, formerly superintendent of the Hermosa mine, in Pima County, Ariz., has gone to Mexico to examine some gold properties for Colorado capitalists.

Mr. S. L. Schoonmaker, formerly Eastern representative of the H. C. Frick Coke Company, has been chosen second vice-president of the Carnegie Steel Company, at Pittsburg.

Mr. Robert P. Porter has resigned his position as superintendent of the census, to take effect immediately. It is stated that he has completed arrangements to enter into business in New York.

Mr. C. M. Schwab, superintendent of the Homestead Steel Works, Homestead, Pa., sails for Europe, July 15th, and will make a visit to the leading steel works in Great Britain and Germany.

Mr. John Stanton, secretary and treasurer of the Atlantic, the Central and the Allouez mining companies, and president of the Wolverine Copper Mining Company, was in Houghton, Mich., last week on his way to visit the mines of his companies.

President Andrews, of Brown University, Providence, R. I., who was a delegate to the Brussels Silver Conference, has been in Colorado making an investigation into the conditions of the production of silver there, and has visited the mines at Aspen, Leadville and other places. He has also made addresses on the silver question to large audiences in Aspen and Denver.

Mr. John L. McNeil, State Inspector of Mines, of Colorado, was recently requested by the Governor of that State to resign, but declined to do so. He also states that he does not recognize the power of the governor to remove him except on charges of malfeasance in office duly proved. Nothing of this kind has been alleged against Mr. McNeil, the removal desired by the governor being for political reasons. Mr. McNeil has held the office for eight years.

OBITUARY

John T. Berningham, one of the pioneers of the silver district, of western Colorado, died at Silver Plume, June 30th, aged 43 years.

Samuel M. Luckey, who died in Central City, Colo., July 6th, aged 54 years, was one of the pioneer miners of Colorado, having gone to that State in 1869 from his original home in Ohio.

Prof. William F. Roberts, who died in Hazleton, Pa., July 1st, aged 84 years, was a native of England, but had resided for many years in Pennsylvania. He was well known as a geologist and had contributed many articles to scientific papers.

E. B. Bothil, who killed himself in Denver, Colo., July 9th, by taking morphine, must be counted the first victim of the silver agitation. He left a letter explaining that he had committed suicide as the world was too hard and the price of silver was too low.

George A. Meeers committed suicide by shooting at Salt Lake City, Utah, July 7th. He has been for some years heavily interested in mining in Utah and Montana. For some time past has been harassed by litigation, resulting in some financial trouble. This was intensified by the fall of silver, which was the immediate cause of his rash action.

John F. Cassell, a prominent mining man and stock operator, died at his home, in San Francisco, July 1st, after a long illness from diabetes and cancer of the liver. Deceased was born in Baltimore, Md., and went to California early in the fifties; he was 55 years old at the time of his death. He was interested in mining ventures in the Belmont, Meadow Valley, Pioche and Tuscarora districts, and accumulated a comfortable fortune. He leaves a widow and several children.

SOCIETIES AND TECHNICAL SCHOOLS

Western Foundrymen's Association.—At the regular meeting in Chicago, June 21st, a paper on "The Unexpected in the Foundry" was read by Thomas P. West. Mr. William Ferguson read a paper on "The Development of the Foundry in America," which was followed by a general discussion.

General Mining Association of Quebec.—The regular quarterly meeting was held in Sherbrooke July 5th; at the morning session general business was transacted and several new members were elected, after which an interesting paper on the "Eustis Copper Mines" was read by Mr. John Glue, of Capelton. At the afternoon session several shorter papers were read and discussed.

Foundrymen's Association.—At the regular monthly meeting, in Philadelphia, July 6th, reports on the condition of the different branches of the trade were presented by the different committees. The pipe foundries generally reported business good, but the malleable iron section reported the trade in poor condition. Mr. C. Henderson made an address on "Chemistry as Applied to the Iron Foundry Industry," which was followed by a discussion. The Association passed resolutions urging upon Congress the repeal of the Sherman Silver law.

Engineers' Society of Western Pennsylvania.—The regular meeting of the Society was held on June 20th. Four applicants were elected to membership. Two important papers were read and ordered printed for discussion at the September meeting. "Gas and Gas Producers," by Walter E. Koch; and "The Effects of Suddenly Applied Loads Upon the Tensile Strength and Other Physical Properties of Wrought Iron and Steel," by E. D. Estrada.

At the meeting of the Chemical Section, on June 27th, Mr. Jas. O. Handy read a paper on "Moisture Determination in Dynamite," and one on "Notes on Phosphorus Determination." Prof. F. C. Phillips spoke of the use of natural gas in many chemical processes. Mr. R. B. Carnahan, Jr., described rapid precipitation by passing air instead of shaking. He also related instances of failure in phosphorus determination in pig iron, which were apparently due to the incomplete action of permanganate of potassium or to the precipitation of silica with the molybdate.

British Iron Trade Association.—A meeting was held June 29th, the object being to consider papers bearing upon the present depressed condition of the iron trade. Mr. W. S. Caine, M. P., read a paper on "The Iron and Steel Industries and Colonial Railway Development," in which he complained of the remarkably slow progress made in the extension of Indian and colonial railways as compared with the progress achieved in the United States and in some European countries. Railways in India were the most urgent need of the people, and many districts were steeped in the direst misery for lack of the necessary means of communication. Sir William Houldsworth, M. P., read a paper on "The Present Depression in the Iron Trade as Affected by Currency Questions." He said the ordinary demand for iron and steel manufactures was not sufficient to keep at steady operation, at remunerative prices, the great producing machinery of this and other countries. Consequently, when the flow of general trade became sluggish, and enterprise and the development of new countries was interfered with, shipbuilding, railway making, etc., became stagnant. Therefore, currency was a subject to which they must in future give attention. Mr. Stephen Jeans next read a paper on the "Chicago World's Fair of 1893, and Its Lessons to the Iron Trade of Great Britain."

INDUSTRIAL NOTES

The Landon Iron Company has put its furnace at Chapinville, Conn., in blast.

The Ohio Forging Works, of Columbus, O., are preparing to move the plant to Athens, O.

The Allegheny Iron Company will put its furnace, at Iron Gate, Va., in blast again very shortly.

The Columbia Iron and Wire Works Company has been organized by J. G. Raber and others, at Canton, O.

The Sterling Cold Rolled Steel Company has made arrangements to build a plant at Wilson's Station, near Pittsburg.

The sale of the property of the Brady's Bend Iron Company, at Brady's Bend, Pa., has been adjourned until August 1st.

The Simonds Rolling Machine Company is running its works in Fitchburg, Mass., 22 hours per day, to keep up with orders.

The contract for two high-duty pumping engines for the water-works, at Manchester, N. H., has been awarded to H. R. Worthington, of New York.

The rumor that a consolidation has been effected of the Sharon, the Pittsburg, the standard and the Lancaster Steel Casting companies is officially denied.

The Duquesne Reduction Company has been organized in Pittsburg, to engage in the manufacture of brass and other alloys, and of articles from the same.

The Pennsylvania Steel Refining Company, a new organization, has secured possession of the steel works at Greensburg, Pa., and will put the plant in operation shortly.

The Carrie Furnace Company, in Pittsburg, has blown out one of its furnaces after a run of about 18 months. The furnace will be repaired and remodeled before starting again.

The Coxe Iron Manufacturing Company, of Drifton, Pa., has been incorporated with \$250,000 capital stock, for the manufacture of iron and steel. Alexander B. Coxe is treasurer.

The Jogada Furnace Company, manufacturers of the Jones furnace and mechanical stoker, has

opened an office in Chicago. The headquarters of the company are in Portland, Ore.

The Standard Steel Railroad Tie Company, of New York, has purchased all the patents owned by the Standard Metal Tie and Construction Company and will continue the business of that company.

The West Superior Iron and Steel Company will start up its works, at West Superior, Wis., in a short time, having made an arrangement with its creditors. The company will pay in full with only a moderate delay.

The Whiteley Malleable Casting Company is putting up extensive buildings, at Muncie, Ind. The foundry will be 536 x 80 ft. and the annealing department 420 x 76 ft. in size. The buildings will be completed by October.

The Bay View mills, of the Illinois Steel Company in Milwaukee, started up July 10th, the company having arrived at an agreement with the men, accepting the scale of the Amalgamated Association with a few unimportant changes in details.

The Berlin Iron Bridge Company, of East Berlin, Conn., has received from E. D. Leavitt, consulting engineer, of the Calumet & Hecla Mining Company, contract for the iron roof over a new engine-house, 80 ft. wide and 200 ft. long.

The Stirling Company calls attention to statements in circulation that its boilers were to be removed from the Union Trust Company's building, in New York. The fact is that this is entirely without foundation, and the 300-H. P. boilers in that building are giving entire satisfaction.

The M. C. Bullock Manufacturing Company, of Chicago, issued an illustrated catalogue describing the Bullock Corliss engine, which is well known from the large number of that type now in use. The engine is very fully described and its general appearance and details shown in the illustration.

The contract for gun forgings for the Ordnance Department of the U. S. Army has been divided between the Bethlehem Iron Company and the Midvale Steel Company, of Philadelphia. The Bethlehem company will furnish the forgings for the 8-in. guns and the Midvale company those for the 10-in. and 12-in. guns.

The United States Circuit Court, of New York, has granted an injunction to the Edison Electric Illuminating Company against two parties who have been using incandescent lamps, infringing the Edison patent. These suits were the first brought against users of the Edison lamp as distinguished from manufacturers, and the decision was regarded as important.

The variety of machinery made by Fraser & Chalmers, of Chicago, is illustrated by some of their recent catalogues: No. 1 of steam engines, boilers and mining machinery; No. 4, of gold and silver mills, including all kinds of milling, amalgamating and concentrating machinery, and No. 3, of the Fraser Corliss engine. All these catalogues are fully illustrated and give excellent descriptions of the machinery mentioned.

In Pittsburg, July 12th, Jones & Laughlins signed the steel scale of the Amalgamated Association. The result is a compromise as the company proposed a cut of from 10 to 20% in wages while the workmen conceded from 8 to 15%. The iron scale was signed last week, as already noted. The company's works will resume within a few days. The rolling mill, at Findlay, O., has signed the iron scale making 13 Western mills which have so far accepted the new scale.

The Mecklenburg Iron Works, at Charlotte, N. C., have completed the shipment of the following machinery to the Lustre mine, El Oro, Durango, Mexico: Two 10-stamp batteries, 750-lb. stamps, complete iron and woodwork, with Challenge feeders and silvered plates; three chlorinator barrels, with irons for three reverberatory roasting furnaces, the latter being preferred on account of cheapness in first cost and economy in working. It is the fourth large plant supplied by these works for chlorination. The small repair bills for their stamp mills at the Haile and other mines have brought orders chiefly because of their early adoption of steel cams and tappets.

R. D. Wood & Co., Philadelphia, have issued a handsomely printed and illustrated catalogue of hydraulic tools and machinery, including traveling and jib cranes, presses, riveters, punches, shears, etc. The catalogue also illustrates the accumulators and intensifiers employed in the hydraulic plants made by this company, and their turbine wheels. The use of hydraulic machinery, especially for hoisting purposes, and in machine shops, is rapidly growing, although we have not as yet begun to use such machinery to anything like the extent to which it is employed abroad. The economy of hydraulic power in many places is very marked, and catalogues should be circulated and studied.

The Edward P. Allis Company, of Milwaukee, have issued a handsomely printed and illustrated catalogue, presenting in a comprehensive way the different type of engines which they manufacture, including the several patterns of Reynolds Corliss engine, horizontal and vertical, compound engine, both tandem and cross-compound; vertical blowing engine, both simple and compound; reversing engines for rolling mills, hoisting engines, air com-

pressors, pumping engines, simple compound and triple expansion of different patterns. Among the latter are the great pumping engine for the Chapin Mining Company, which is one of the largest engines of the kind ever built. The catalogue also illustrates the Reynolds air pump and condenser, feed pumps and heaters, and the Reynolds steam stamp. In finish and general appearance the catalogue is a very handsome one.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" of what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.

All 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.

GENERAL MINING NEWS.

Oil.

Stowell's report on new wells for June shows for the Eastern District, covering New York, Pennsylvania and the West Virginia field, 213 new wells, with a producing capacity of 10,605 barrels daily, completed in June. The average producing capacity of these wells is 63.5 barrels. At the close of the month there were 416 wells under the drill, or two less than at the beginning.

The Buckeye District, in Ohio, showed in June 160 new wells completed, with an average daily production of 9,701 barrels, with 191 wells under the drill, June 30th.

In the Southeastern Ohio District the new work shows a falling off, only 15 wells with a capacity of 210 barrels daily having been completed during the month, leaving 24 wells under the drill, June 30th.

The Indiana field shows a slight increase, 47 wells having been completed in June, with a daily output of 5,595 barrels. The number is greater and the average production is also greater than for any previous month of this year. There is also an increase in drilling wells, 54 being reported at the close of the month, against 37 at the end of May.

ARIZONA.

Pinal County.

(From our Special Correspondent.)

Mammoth Mine.—This property, which has produced recently a comparatively small amount of ore, has closed down. It is owned by a syndicate in London, Eng., and it is believed the suspension of work is only temporary. The Mammoth is a gold mine and has yielded to very rich ore.

ARKANSAS.

Faulkner County.

Cascade.—It is reported that the copper deposits discovered near this place will be developed by M. E. Jones & Co., who have an option on the property.

CALIFORNIA.

Amador County.

Albany Gold Mining Company.—The superintendent reports that the face of the Littlefield tunnel still continues in ore. The outlook is that by cleaning out the Middle Bar shaft and running a level, the mine will be in position to supply a number of stamps.

Butte County.

Sierra Buttes Gold Mining Company.—It is reported that this company has bonded the Reasoner mine, situated about one mile south of Forbestown. Development work on the lode will, it is said, commence at once.

(Reported for the "Engineering and Mining Journal.")

For the following information concerning Butte County mines, we are indebted to the courtesy of Mr. Adolf Ekman, Oroville. Much activity is expected among the quartz and gravel mines of Butte County during the rest of the season. A new 10-stamp mill has just been completed by the Mascot Mining Company, which crushes on an average some 38 tons of good grade ore in 24 hours. This property, which is owned by Woodland capitalists, is five miles north of Oroville. One mile from this property is the Golden Banner, which is now being thoroughly prospected by Maj. Frank McLaughlin. This mine was a considerable producer some 30 years ago, but has been closed down for many years. Last fall, however, a shaft was sunk and development work was begun. Four miles north of this a San Jose company is developing a group of mines that in former days were large producers, but which had to be abandoned on account of inefficient pumps. A new shaft is being sunk on a 2 ft. vein of quartz. Hoisting works and a stamp-mill are about completed. Very good assays have been obtained from the quartz and sulphurets on this property.

A number of quartz ledges are being prospected in Oregon City.

Del Norte County.

Reports reach us to the effect that quartz prospectors are making their way into Del Norte County from Josephine County, Oregon. The probabilities of the northeast portion of Del Norte County being the scene of heavy mining operations are favorable, as indications in the past are said to show that that section is in a good mineral belt.

Mono County.

(From our Special Correspondent.)

Bulwer Consolidated Mining Company, Bodie.—A shipment of \$7,800 has been received at the San Francisco office.

Standard Consolidated Mining Company, Bodie.—A bullion shipment valued at \$1,476 has been received from the Standard company, at the local office. A dividend of 10 cents per share, payable July 25th inst., and aggregating \$10,000, has been declared.

Nevada County.

Brunswick Consolidated Gold Mining Company.—Superintendent W. A. Hawley reports that the 700 drift looks well. There is a ledge from 4 to 6 in. thick which looks very well, and a ledge formation of 2 ft. of stringers which look as though they would come together and form a solid ledge. The mine is now in good condition to work.

Centennial Mining Company.—This company has been organized to operate the Centennial Mine in Grass Valley. The directors are J. N. Larkin, J. L. Whiteback, E. A. Roberts, S. B. Nourse and A. W. Stoddard. The principal place of business will be in Sacramento.

San Bernardino County.

(Reported for the "Engineering and Mining Journal.")

Crescent.—The Dooley & Simmonds group of four claims, which were lately sold to Los Angeles parties for \$4,500, has been put in charge of Al Stevens, who will develop them by sinking three shafts to a depth of 100 ft. Some shipping ore is found on the surface. The owners of the Phelps mine has commenced stoping. The first-class ore goes \$300 per ton.—The Spaulding silver mine is producing \$300 ore from a 27-in. pay streak. The property is under the management of Chas. Caulfield.

Gold Bronze.—A shipment from this mine of several carloads of \$200 ore has recently been made. A contract has been let for the sinking of the main shaft 100 ft. deeper, and hoisting works are to be erected.

Good Springs.—A. G. Campbell is shipping a 1,000-ton lot of silver-lead ore from this property to Pueblo, Colo. The grade is high enough to permit it being brought 40 miles by wagons before commencing its long rail journey. A small shipment is also being made from the Kahler mines in the same camp.

Vanderbilt District.—The Mackay and Flood mines have adopted the name of St. George. Shaft No. 2 has reached the 300-ft. level, and a drift on the ledge is being driven. Water has been encountered, which necessitates putting in pumps, and at the same time it solves the problem of a supply for the mill to be erected.

San Francisco County.

(From our Special Correspondent.)

The petitions to resume hydraulic mining placed on file with the Debris Commission have not been so numerous as might have been anticipated. The official estimate of the amount of workable auriferous gravel in the main region about the Sacramento River watershed is as follows: North Yuba watershed, 90,000,000 cu. yds.; Middle Yuba, 140,000,000; South Yuba, 560,000,000; Deer Creek, 25,000,000; below forks of the Yuba, 40,000,000; Bear River region, 157,000,000; above forks of the American, 105,000,000; total, 1,317,000,000 cu. yds. This amount of gravel is estimated to be worth about \$335,000,000, and forms but a small portion of the watershed of the Sierras.

It is generally stated by mining men that when the hydraulic mines are again working, the production will fall far short of the \$10,000,000 per year which was produced 12 years ago. The new conditions now existing under the new law will account for this. In addition to the cost of dams, plant, operations and the 3% tax on the gross receipts which will go to the Debris Commission, there will be the impossibility in many cases of washing gravel fast enough to make it profitable. When a miner puts up a dam he will not be allowed to wash into it more tailings than will properly settle. Instead of working 24 hours each day, work must stop for so many hours to allow the mud to settle; and thus plant and operating expenses will be as great with a decline in the production. In any case it will be several years before there is a full resumption of work. Twelve years ago there was \$100,000,000 invested in these mines, and to get these all in running order again will take time and millions of money.

COLORADO.

Boulder County.

El Dorado District.—This new gold mining district is on Middle Boulder Creek, and several promising lodes have been discovered. On the Mildred Belle a discovery shaft has been sunk about 15 ft. and is being driven as fast as possible. On the Bonanza lode two tunnels have been run 65 and 30 ft., respectively, and some ore of good quality has been shipped. A number of other lodes have

been located, but no work beyond prospecting done upon them.

Clear Creek County.

Whale Mining Company.—This company has been organized by N. C. Merrill, of Denver, E. E. Ives, of Kansas City, and W. M. Mitchell, of Topeka, Kan., and others. The new company has procured a group of nine claims on Yankee Hill, and also the Abbott-Mitchell and Denver claims, owned by the Orphan Boy Company. Work is to be started on these properties at once.

(Reported for the "Engineering and Mining Journal.")

For the following information regarding mines in the vicinity of Georgetown we are indebted to the courtesy of Mr. Richard Old, who has mined in Clear Creek County almost uninterruptedly for 23 years, and in Colorado for 29. Mr. Old's individual interests are confined to:

Mendota-Fulton Mines.—These are patented claims and on the same vein, which is a well defined fissure vein, with a filling of quartz and more or less decomposed feldspar. The ores are argenteiferous galena associated with at times quite large bodies of zinc blende intermixed also with iron and copper pyrites. Grey copper and occasionally massive polybasite are also encountered. In the latter case the ore is unusually rich. A trace of gold is found in all of the ores and when the ore contains a tenth of an ounce or over it is paid for by the smelters at the rate of \$20 an ounce, with a deduction of 5% for loss in smelting.

These mines have been developed by the sinking of four shafts to a little over 400 ft.; the shafts are connected with levels run east and west from the Victoria tunnel, which also belongs to Mr. Old. The aggregate length of all the main levels is a little over 6,000 ft. The three compartment shafts are 76 ft. below the west tunnel level and a winze under the east tunnel level has reached the same depth. Mr. Old proposes to erect a power plant consisting of air compressors and five or six drills, which will be used in extending the tunnel and sinking the shaft, as well as opening up the main levels.

The first grade galena ore, assaying 30% of lead and upward, is sold directly to smelters, as is also a class assaying 10 to 30% lead, but this latter class is less desirable, as instead of going direct to the mixing piles it is roasted when it contains an excess of zinc; a third class is made up of screenings, cobbings and scattered ore in the gangue as it is mined. This assays under 10% lead and is sold to local concentrating works.

The total gross output from the Mendota Fulton mines from their opening to date (June 12th, 1893) has been 13,214 tons of ore, with a gross value of \$980,633, or an average value of \$74.21 per ton. During 1892 the total gross output of ore was 3,008 tons, the mineral contents of which were: Gold, 221 oz.; silver, 131,056½ oz.; lead, 2,908,637 lbs. Part only of the gold was paid for. This was an average of 43¼ oz. silver and 48% lead. The gold was under 1-10 oz. per ton and as a part was paid for (equivalent to about a third of the total amount) a very large portion returned little more than a trace.

El Paso County.

It is reported that the entire property of W. S. Stratton, in the Cripple Creek district, including the Independence, Washington, May Raymond and several other claims, has been sold to San Francisco parties for \$155,000.

Local papers state that Edward M. De La Vergne, A. Hemenway and A. R. Hackman, owners of the O. K. lode, have filed an adverse against the Silver Tip lode, the property of the Enola Mining Company. The same complainants have also filed an adverse against the New Zealand lode, the property of the New Zealand Mining Company.

Pharmacist Mining Company.—This property is now shipping about 20 tons of milling ore per day to Beaver Park, besides eight tons of smelting ore by way of Divide.

Prince Albert.—An important strike of high-grade ore is reported on this mine.

Hinsdale County.

Golden Fleece Mining and Milling Company.—This company has been incorporated with headquarters in Denver, to operate the Golden Fleece mines, in the Lake City district. It is a reincorporation, as the mines have been worked for some time. For the first year the directors of the company are Henry W. Hobson, S. S. Kennedy, George W. Pierce, David K. Lee and E. A. Kent. Henry W. Hobson is president; George W. Pierce, secretary and treasurer, and S. S. Kennedy manager.

Lake County.

(From our Special Correspondent.)

The camp is dull since the great fall of silver, and not one of the big producers that closed down last week has yet made a move to open up. That affairs will remain so and the mines remain idle until some stable price is given silver now seems an assured fact.

At the smelters there is practically no change in the situation. All except the Bimetallic and Elgin are running full force in order to work off their stocks as fast as possible.

Among the few who are still working is the Wolcott. The lease on the Wolcott is worked by the Indiana Mining Company. After an immense amount of work a very large body of concentrating ore was opened up some 200 ft. from the shaft and from here over 90 tons daily of this mineral is being shipped. There are many work-

ings in this mine. In No. 1 stope the ore has been up 6 ft. in height with no top or bottom in sight; in stopes 2, 3 and 4 large bodies of this lead ore are showing, also with neither bottom or top in sight. It is believed that both above and below these ore bodies are other reserves which as yet have not been touched. Last month the mine produced 60 tons daily, valued at \$30,000. A new shaft is to be sunk as soon as the outlook is some better.

Mr. G. H. F. Meyer has closed down his properties at Gilman, as well as Leadville. He has been operating the Smuggler and has laid off the entire force.

(Reported for the "Engineering and Mining Journal.")

Aspen Mining and Smelting Company.—The mines of the Aspen Mining and Smelting Company embrace 85 acres of patented ground situated on Aspen Mountain, and extending from the limits of the town, at the level of the valley, south to a point 1,800 ft. in elevation above the streets. The ore is found at the plane of contact between a bed of overlying blue limestone and a bed of dolomite at the localities where this contact plane is intersected by certain fault planes, which traverse the country in a generally north and south direction. The ore bodies vary from 1 to 40 ft. in thickness, and consist principally of the altered country rock, inclosing also considerable heavy spar. In some places the limestone is largely replaced by galena of very fine grain; while, in other localities, deposits of gray copper and clear polybasite and stephanite are found, varying from a few inches to 2 or 3 ft. in thickness. Native silver also occurs in moderate quantities in massive nuggets of from 1 to 10 lbs. in weight. The mines were discovered in 1879, and were more or less actively operated in 1884 and 1885. The railroads reached Aspen in November, 1887, since which date operations have been carried on extensively. The development, at this date, consists of nearly nine and one-half miles of developing drifts, levels and upraises, connecting large stoped areas. The product, since the organization of the Aspen Mining and Smelting Company, has been as follows: 1886, \$66,394; 1887, \$150,682; 1888, \$1,218,430; 1889, \$830,033; 1890, \$811,625; 1891, \$679,700; 1892, \$1,006,344. The output in 1892 amounted to 37,400 tons, and for 1893, up to June 1st, 12,350 tons. The ores vary in value from \$20 to nearly \$1,000 per ton, and contain an average of over 10% lead. The whole product is treated by the Philadelphia Smelting and Refining Company, at Pueblo, Colo., being subjected to an average freight rate of \$6 per ton for delivery at that point.

Considerable annoyance has been experienced during the past 12 months from the influx of quantities of water in the lower levels of the mine, some portions of the company's territory being thus rendered inaccessible. Arrangements will soon be perfected, however, which will effectually prevent the recurrence of floods in the mines. A vertical depth of 1,684 ft. exists between the highest and lowest workings. During the early history of the Aspen Mining and Smelting Company vexatious and long-continued litigation ensued under the "law of the apex." Upon the final settlement of this question in 1887, an indebtedness of over \$500,000 existed, which has been canceled, and \$780,000 in dividends have been paid, while a substantial cash surplus remains. The company is now paying a regular dividend of 10c. per share, amounting to \$20,000 per month. The organization is based upon a capital of \$2,000,000 divided into 200,000 shares of the par value of \$10 each. The officers of the company are: J. R. Wheeler, president; J. L. Tilton, secretary; Samuel S. Earle, treasurer, at 54 Wall street, New York; Fred. G. Bulkeley, general manager, at Aspen, Colo.

Pueblo County.

Pueblo Smelting and Refining Company.—The recent fire at this company's plant was confined to the Sturtevant mill and the new roaster. No other damage of moment resulted. All was insured. There will be slight inconvenience and some delay in one department, but the output of the works will not be impaired. The furnaces and all the refineries, as well as the old grinding mill, the engines, the laboratories for assays, the ore bins and the repair shops are unharmed.

Saguache County.

The ore shipments from Creede for June were as follows: Amethyst, 255 cars; New York, 182; Last Chance, 65; Bachelor, 19; Alhna, 1; Yellow Jacket, 1; total, 523 cars; estimated tonnage, 7,000.

San Miguel County.

San Francisco.—This mine, owned by E. J. Warner and W. W. Hooper, is improving as work progresses. About 300 tons of free milling gold ore have been taken out, the assays averaging about \$15. The owners have leased the Weller mill for the present.

Smuggler-Union Mining Company.—This company will work its mine for at least a month longer, regardless of the price of silver.

Telluride.—Shipments of ore and concentrates from Telluride for the week ending July 1st were: Smuggler-Union, 61 cars; Hector, 4; Humboldt, 4; Columbia, 1; total, 70 cars. This makes 970 cars shipped since January 1st.

Summit County.

Blue Hill Mining Company.—This company has ordered its mine and mill, at Breckenridge, closed down for the present.

Extension.—It is said that the streak of high-grade gold ore has now been opened in three places, showing it to be continuous for at least 150 ft. This ore is free-milling and has given an average yield of 7 oz. gold to the ton.

FLORIDA.

Citrus County.

Jackson Phosphate Mines.—Mr. W. K. Jackson is putting up a steel log washer and dry kilns with a capacity of 75 tons per day at his mines near Inverness.

Polk County.

Land Pebble Phosphate Company.—This company has begun to remodel its plant near Lakeland, and will put in new machinery of the latest patterns.

GEORGIA.

Lumpkin County.

The copper mine included in lots Nos. 100 and 109, near Dahnaga, was sold recently at public sale, and bought by Geo. W. Scott, N. P. Pratt, W. C. Smith and others, of New York, for \$5,815. Copper was discovered on this property years ago, but no work has ever been done upon it beyond some prospecting.

IDAHO.

Kootenai County.

Idaho Antimony Mining Company.—This company has started up its concentrator and smelter, on Pine Creek, in the Coeur d'Alene district.

Latah County.

Vollmer District.—A Mr. Ogilby, while prospecting recently, found a gold-bearing quartz ledge which at a depth of 10 ft. is 2 ft. wide, according to the Moscow "Democrat."

Logan County.

Camas No. 2.—This mine was sold at public sale, in Bellevue, June 27th, by the referee under order of court. It was bought for \$30,000 by W. K. James, as attorney for Thomas E. Tootle and others, of St. Joseph, Mo. The purchasers held most of the claims against the mine.

Owyhee County.

Black Jack.—The mill is now working to its full capacity. About 70% of the value of the ore is saved in the form of concentrates, which are shipped to the Denver smelters. A new reservoir has been constructed in Blue Gulch, which will secure a water supply for the mill at all seasons.

Poorman.—The Silver City "Avalanche" reports that tunnel No. 3 is now 110 ft. in the ore shute, the face showing 2 ft. 9 in. of ore. The raise from the tunnel is now up 50 ft., and another raise has been started. The Osó drift is now in 108 ft. and shows at its face about 3 ft. of second-class ore, with 7 in. of richer ore.

INDIANA.

Coal.

The provisions of the new law requiring weekly payments and the weighing of coal as it comes from the mine are bearing heavily upon the bituminous coal operators in the State, and a committee has been appointed to confer with block coal operators with a view to bringing suit to test the constitutionality of the law. It is said that when the new schedule was signed the miners waived both of these requirements, but since then many have been calling on the State Mine Inspector to enforce the law.

KANSAS.

Coal.

The miners have finally rejected the last proposition made by the company, and there seems to be no prospect of an early settlement of difficulties. The coal companies have not yet begun importing non-union laborers, as they threatened to do some time ago, but it is said that they will wait only a short time before taking some such action.

MARYLAND.

Franklin Consolidated Coal Company.—Judge Dennis, of Baltimore, has signed an order requiring all persons interested in this company to show cause by July 27th why the company should not be dissolved. The dissolution was asked for by the company itself, owing to differences of opinion among the stockholders as to the management. At a recent meeting two rival boards of directors and two sets of officers were elected. In the bill filed by the company it is also stated that the company is indebted in a large sum to the estate of James Boyce and is unable to pay the same. The assets of the company are valued at \$60,781; liabilities, \$38,129; capital stock, \$5,000,000, of which \$4,494,600 in shares has been issued to Boyce, the owner of the coal lands.

Allegheny County.

An explosion of firedamp took place July 10th in mine No. 1 of the West Virginia Central Railroad property, near Cumberland. The causes of the explosion were unknown. The mine was filled with flame and smoke, but of the 90 men at work in it all succeeded in escaping, except two who were killed and three or four who were slightly hurt.

MISSOURI.

Iron—Marquette Range.

Lake Superior Iron Company.—The report of this company for the year ending April 30th, 1893, shows: Gross earnings, \$1,370,783; expenses, \$1,398,646, making a deficit of \$27,863, but ore on

hand is reckoned as cash, making the net earnings \$172,030, after crediting depreciation account with \$155,688. Balance sheet shows assets of \$854,426 in excess of liabilities. The company had 196,608 tons of ore in stock May 1st, 1892, has mined 474,087 tons during the year, has shipped 370,269 tons, and had 295,426 tons at mine April 29th. The six steamers owned by the company transported 410,140 tons of ore, coal and grain, at a profit of over 6% on their book valuation of \$852,550, after writing off \$67,550 for depreciation. The mine exceeded its heretofore largest production by 122,000 tons; \$100,087 was expended for special repairs and charged to ore mined. Since 1881 the company has paid \$3,882,000 in dividends, and increased net reserve from \$402,653 to \$854,426.

Winthrop Iron Company.—This company, employing 450 men, has closed down owing to the difficulties of getting money, and the low price of ore.

MINNESOTA.

Iron—Mesaba Range.

(From our Special Correspondent.)

Developments are not progressing as rapidly on the Mesaba as could be wished, and a number of properties that had expected to be active at this time are retrenching, while several have already shut down. The streets of Duluth are full of idle men, who have flocked there from the Michigan ranges hoping for work on the Mesaba, but who have been quite generally disappointed. To these are added the large number discharged lately by the Minnesota Iron Company. The Duluth, Missabe & Northern Railroad should be able to handle a little ore over its new dock in 10 days, though the track to the dock will not be complete. For a few weeks ore can be brought around by the St. Paul & Duluth Railroad and pushed back to the dock. Ore freights to Lake Erie are now about 75 to 80 cents, while considerable wheat has been chartered from Duluth to Buffalo at 1½ cents, a rate equivalent to 56 cents a ton for ore. Last year ore freights ranged between \$1.00 to \$1.40 per ton, the average of the season being about \$1.18. They have never been so low as now. Among the Mesaba properties where operations are to be stopped for the present are the Great Northern, Great Western, Lone Jack, Mesaba Chief, and probably the Missabe Mountain and some others. Explorations are also curtailed on new properties.

Adams Iron Company.—Negotiations are pending by which a majority interest in this property, now owned by P. L. Kimberley, John T. Jones, D. T. Adams, and others, will be bought by Frank Rockefeller, representing the Merritt-Wetmore-Colby syndicate, of New York, at the rate of \$800,000 for the mine. D. T. Adams is now in the East to close the deal.

Hale.—This mine, operated by the Standard Ore Company, begins shipping non-Bessemer ore this week. It will be able to ship some Bessemer shortly.

Missabe Mountain.—This mine, operated by the Oliver Mining Company under lease, is under contract with the owners to mine or pay royalty on 200,000 tons this year. A cut through the surface over the ore 250 ft. by 50 ft. has been made and a steam shovel has begun running a cut lengthwise of this, and wide enough for one track in the ore. The shovel lays the ore back on the stripped area and will be stationed at the entrance of the cut to mine direct into cars from the ore body. There is a surface of drift of from 4 to 15 ft. over the ore. At a depth of 100 ft. in ore assays show some 60% iron. The ore body so far test-pitted is some 2,250 ft. long, and averages 700 ft. wide. On July 10th operations close down for a short time.

Moose.—This mine, in 8-58-17, is being stripped for open pit mining by steam shovel. The deposit of 55% manganese, found two weeks ago, is being exploited most satisfactorily.

Mountain Iron Company.—This company loaded its first cars by steam shovel direct from the ore body last week. It has sold 50,000 tons for this year and probably will ship quite a good deal more.

Iron—Vermilion Range.

The work of repairing fire damages at the Commodore and Franklin mines is now in progress. Nearly all the surface improvements were destroyed, but will soon be replaced. The Ohio Mining Company's camps were not destroyed by fire, as at first reported.

Pioneer Iron Company.—This company has given orders that a \$40,000 hoisting and pumping plant which was to be built, be delayed until next year. The company is sinking a four-compartment shaft 800 ft., and is down 250 ft., but will stop work shortly.

Mountain Iron.

The Vermilion "Iron Journal" reports that pits sunk on this property show an extensive body of ore; options on this are held by C. F. Howe and N. Moore.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

Joplin, July 11.

The past two weeks have been the dulllest ever experienced in this lead and zinc mining district. This was due to the low price of ore and the strike of the coal miners. According to the latest reports from the coalfields, the operators and miners have agreed on terms of settlement, so that the

coal mines will soon be running in full force. This had a good effect on the lead and zinc ore market during the latter part of the week, as the demand increased and prices advanced. The zinc ore market opened one week ago at \$17@18 per ton, but closed Saturday evening at \$19@20. Lead ore advanced from \$17.50@19 per thousand. A number of the largest producers of the district are still closed down, while some are running with a small force and holding their ore in bins for better prices. Following are the sales of ore from the different camps for the past two weeks: Joplin mines, 2,252,650 lbs. zinc ore and 344,600 lead, value \$26,613; Webb City mines, 1,399,290 lbs. zinc ore and 37,490 lead, value \$12,278; Cartersville mines, 2,278,580 lbs. zinc ore and 174,570 lead, value \$24,500; Zincite mines, 87,110 lbs. zinc ore and 2,560 lead, value \$881; Oronogo mines, 65,420 lbs. zinc ore and 27,510 lead, value \$1,009; Alba mines, 210,190 lbs. zinc ore, value \$1,618; Galena, Kan., mines, 2,015,325 lbs. zinc ore and 100,000 lead, value \$19,670; district's total value, \$86,569. Lawrence County mines: Aurora mines, 1,880,270 lbs. zinc ore and 231,600 lead, value \$18,515; Wentworth mines, 46,112 lbs. zinc ore, value \$462; lead and zinc belt's total value for the past two weeks, \$105,546.

It can be readily seen from the foregoing productions of the past two weeks that the strike of the coal miners has been the direct cause of reducing the value of this lead and zinc belt not less than 50%, as under ordinary conditions the value of the lead and zinc productions should not fall below \$100,000 per week.

St. Francois County.

Iron Mountain.—It is announced that mining operations are to be finally abandoned, the great deposit of iron ore having been exhausted so that the working no longer pays. This has been anticipated for some time, as the yield has been growing lighter for several years past.

MONTANA.

Cascade County.

Sand Coulee Coal Mine.—This mine is now yielding about 1,500 tons of coal a day. The coal is shipped westward for the most part, finding a market along the line of the railroad. Mr. Henry Burrell is superintendent of the mine.

Deer Lodge County.

American Eagle Mine.—This claim, which is owned by Rosenfield & Co., of Anaconda, is being opened by a tunnel.

Champion Mine.—A force is employed on this mine cutting the tunnel, which is now in over 700 ft., and is expected to strike the shaft about the 800-ft. level.

Royal Mine.—A small force only is at work. The mine is looking well with high-grade ore in sight.

Scott Mine.—Work on this claim, near Meaderville, is being pushed. The shaft is now down about 100 ft. and is showing very good indications.

Granite County.

Bi-Metallic.—The Phillipsburg "Mail" reports that this mill has made arrangements to use coal instead of wood for fuel. An elevator and coal bins have been built. The company has some coal property on Upper Willow Creek, about five miles from Drummond, to which a spur track is now being built. The coal is of fine quality and the bed has been traced some seven miles.

Madison County.

A new gold camp has been opened in the neighborhood of Sand Creek. At present but few claims are worked, but these have shown large bodies of ore. At the Duncan mine the shaft is 100 ft. deep.

High Ridge Mine.—This mine is now being worked under lease by Messrs. Peterson & MacMillan, of Butte; the shaft is now down 130 ft., and at that depth the vein is about 3 ft. wide, the ore being chiefly silver-lead, carrying a little gold. A carload of first-class ore was recently shipped to Kansas City for treatment.

Silver Bow County.

Blue Wing Mine.—This mine, which belongs to the Alice Mining Company, and is under lease to Rohne & Co., will not shut down. It is said the mine is producing some rich ore.

Butte & Boston Mining Company.—During June this company produced 796 tons of fine copper, 69,000 oz. of silver and \$13,750 in bullion. It also received \$4,200 in royalties.

Mexican Mining Company.—This company has addressed a letter to the business men of Butte which says: To tide over the prospective period of depression, an option has been given to a large number of our miners that they may continue work on the Tribute system. Facilities will be given to make the arrangement remunerative, and a safe basis for the legitimate and necessary dealings between the miners and the business men of Butte.

Moulton Mining Company.—This company will take advantage of the enforced shut-down to retimber the shaft from the 200-ft. level up. Two shifts will be employed.

Parrott Mining Company.—Suit has been brought against this company by Mr. C. S. Sullivan, who relates in his complaint, that the defendant sank a 30-ft. shaft on one of his claims and endangered life by leaving the shaft uncovered.

Parrot Smelter.—This smelter is doing much custom work and is making regular shipments of

copper matte; the ore is chiefly from the Parrot, Moscow and Bricker mines.

NEVADA.

Eureka County.

Grizzly Mining Company.—It is reported that a strike of very rich ore has been made in this company's property, in the Ruby Hill district. The vein was uncovered by a drift from the main shaft, and has been followed so far for about 30 ft.

Lincoln County.

Verde Mine.—A force of men are at work on this claim, near Pioche, and some good ore has been found; the claim is owned by Messrs. Cohen and Wilson.

Storey County—Comstock Lode.

(From our Special Correspondent.)

The following is the weekly tabulated statement of ore hoisted from Comstock mines and milled, with the ear and battery assays, bullion shipments, etc.:

Mines.	Tons Hoist'd	AvCar Simple Assay.	Tons Mill'd	Av. Bat'ry Assay.	Bullion for Week.	Bullion shipped.
Belcher	598	31.47	653	24.64	.....	12,334.20
C. C. & Va. Crown Pt.	.....	.....	220	18.67	.....	.....
Justice	.....	.....	.....	.....	.....	.....
Potosi	613	29.07	613	26.93	.....	2400 lbs.
Savage	200	30.60	180	24.00	.....	5,031.60

¹To Carson Mint. ²Crude bullion.

Washoe County.

Sunset Mining Company.—This company has been incorporated with its principal place of business at Wadsworth, and with the following officers: President, W. H. A. Pike; secretary, N. A. Hummels; superintendent, James Crosby; treasurer, John Schwandt.

NEW HAMPSHIRE.

Hillsborough County.

Brookline.—The new granite quarry at this place is full of work. A large derrick and hoisting engine, built by Whitcomb Brothers, of Barre, Vt., has just been erected.

NEW JERSEY.

Morris County.

Mount Hope.—These mines closed down July 1st, the reason given being that it is impossible to work at a profit at present, owing to the low price of iron ore. The Dover "Iron Era" says that there is no means of learning whether the shut down is only temporary or whether it will be permanent. The fact that the cars and tracks and pipes were all left below ground gives hope that the mines may soon resume.

NEW MEXICO.

Colfax County.

Lead Hills District.—This new mining district, about eight miles from Elizabethtown, is attracting much interest, according to local papers. The character of the formation is of blue and dolomite limes, porphyry, quartzite and shale. The lime bodies are very heavy indeed, and are found in contact fissure veins, ranging from one-half to one-eighth dip. The overflow of mineral in this section shows gold, galena, copper and silver glance, and also gray copper. Some prospecting has been done on various claims, and arrangements have been made to do more serious work.

Lincoln County.

Glass Mill.—This mill is to be started up and will run for the present on ore from the Carlisle mine.

Vera Cruz Mining Company.—This company has secured a good supply of water by driving down a well about 130 ft. and has started up its 15-stamp mill.

Taos County.

Rockingham Gold Mining and Milling Company.—W. B. Tuttle, C. R. Tuttle, A. C. Haltzell, C. F. Hawkins, B. A. Dyer, I. G. Wing and H. Turner have incorporated this company to operate in Taos County, New Mex., and various counties of Colorado. Capital stock, \$500,000.

NEW YORK.

St. Lawrence County.

Benson Mine.—This mine has been closed down for the present, and will probably remain closed unless there is an improvement in the market. The mine is near Tupper Lake, in the Adirondack region, and is a large producer of magnetic iron ore.

NORTH CAROLINA.

Mitchell County.

Cranberry Iron Mines.—These mines have shut down for the present, as the company's furnace has gone out of blast. It is said that work will be resumed as soon as the furnace is repaired.

Montgomery County.

(From an Occasional Correspondent.)

The 10-ton cyanide plant, at the Maratock mine, in Montgomery County, has closed down. The gentleman sent from Denver to operate it is reported as saying the ore was too low grade. The manager maintains he has \$10-gold ore.

Capt. H. A. Judd, who is in charge of the Parker gold mine and Sam Christian mine, deposited at

the U. S. Assay Office last month a fine bar of gold, the result of tribute work after the late heavy rains.

Stanly County.

(From an Occasional Correspondent.)

Mr. A. C. Manney, of Gold Hill, reports that a company of gentlemen are about to organize for the purpose of working the Barringer gold mine, in Stanly County. This mine has produced very rich ore. The ore has a small percentage of sulphurets and galena, which make a rich concentrate. These will be collected, provided they can be disposed of. At present there is no smelter or works in the State where ores or concentrates can be sold.

OREGON.

Grant County.

(Reported for the "Engineering and Mining Journal.")

Canyonville Mining, Water and Manufacturing Company.—The property of this company consists entirely of placer mines, including several thousand acres. The company is now building 26 miles of flume and putting down about 16,000 ft. of pipe in order to bring water to its ground with a head of from 150 to 500 ft., for hydraulic purposes. The placer ground is part of an old river channel and varies in depth from 5 ft. to 150 ft.; as far as prospected all of it carries some gold, the top, of course, being fine, while about 75% is coarse gold, minting about \$19.50 per oz. A piece of ground worked last winter during the rainy season, yielded 58 cents per cubic yard. Another piece of 500 cu. yds. gave \$560, while other test workings showed from 72 cu. yds., \$67; from 92 cu. yds., \$30, and from 2,600 cu. yds., \$1,200. The ground was worked from top to bottom, the object being to test the exact value of the gravel. The value of this placer has been known for some time, but it has been thought impossible to get a supply of water. There are known to be many gold-bearing quartz veins in this vicinity, but as the ore is not free-milling, they have received little attention. Several veins are given assays of from \$30 to \$80 per ton in gold.

International Nickel Mining Company.—The mines of this company are about 10 miles west of Canyonville and four miles from Riddle. So far as they have been examined the ore is of a high-grade, bearing from 4 to 22% nickel, and the deposits are extensive. The company has under construction works of a capacity of 200 tons per day. For the above information we are indebted to Mr. W. C. Stanley, manager Canyonville Mining and Water Company.

PENNSYLVANIA.

Anthracite Coal.

Coxe Brothers & Co.—According to the Scranton "Times," workmen of this company while driving a tunnel through Buck Mountain, near Beaver Meadow colliery, to drain a slope of water, struck a fine vein of coal 4 ft. thick and remarkably free from impurities. Orders have promptly been given to open up gangways. The find is regarded as very timely and means renewed employment to many workmen underground.

Delaware, Lackawanna & Western Company.—Two men were killed and four badly hurt by an explosion of gas in the Pettibone mine, at Wyoming, operated by this company. The explosion is said to have been caused by a gathering of gas in one of the breasts, the air current having been changed by an inexperienced boy who left one of the doors open.

Pennsylvania Coal Company.—This company has started up its Old Forge colliery, which had been shut down for a short time for repairs to the machinery.

Philadelphia & Reading Coal and Iron Company.—Another attempt will be made to locate the fire in the old Potts colliery, at Locust Dale, Pa. Orders have been issued to pump the water out above the bottom lift, so that the old workings may be reached. The water in the old lift will be allowed to stand until after the results of the investigation are learned.

William Penn Colliery.—The new breaker is now completed and in running order. The mine and breaker now employ about 750 men and boys, and the output is about 1,000 tons per day. Arrangements have been made by which shipments will hereafter be made over the Pennsylvania Railroad, instead of the Philadelphia & Reading as heretofore.

Bituminous Coal.

Vesta Coal Company.—The No. 1 mine of this company, at McKeesport, is being newly equipped. It is the intention to run 15 cutting machines when everything is in readiness.

SOUTH CAROLINA.

Phosphates.

State Inspector Jones reports that the royalties paid the State by phosphate operators for the eight months of the fiscal year ending June 30 amounted to \$175,000, an increase of \$18,000 over the corresponding period last year.

(From an Occasional Correspondent.)

New York capital has been subscribed for the erection of a reduction works, at Blacksburg, S. C. It is the object of the company to purchase ores and concentrates. The general opinion in this State is that if they are prepared to utilize all the products of our ores, such as lead, copper, zinc

and sulphur with the gold and silver, they will make a success. The management of the concern will be under the direction of the eminent metallurgists, Ricketts & Banks.

SOUTH DAKOTA.

Clark County.

Colonial Mining Company.—At the annual meeting recently, the following officers were chosen: President and superintendent, Josiah Craig; vice-president, J. M. Craig; secretary and treasurer, Frank McLaughlin. The company owns several claims on Richmond Hill, near Carbonate and between Garden City and Bald Mountain. Development work has been going on since last fall and the openings show considerable ore of low-grade, carrying \$10 to \$16 in gold per ton.

Custer County.

Amazon Mine.—The shaft on this mine is now down 40 ft., and will be sunk some 10 ft. deeper when cross-cutting will begin; the ore is becoming somewhat richer in gold as the depth increases, and a recent assay gave returns of \$20.67 gold and 1 oz. silver per ton.

Lawrence County.

Central City Mining and Milling Company.—This company has been formerly incorporated; it is now operating the Minerva mine, in Blackdale.

Darboy Mining Company.—At the annual meeting, held in Central City, recently, the following officers were elected: W. A. Gray, president; P. D. Mix, vice-president; John Delaunay, treasurer; D. E. Mullins, secretary. An assessment of two mills per share was levied on the stock of the company.

Deadwood & Delaware Smelter.—The plant is now being run at half its capacity, stacks Nos. 1 and 4 having blown in.

McDonnell Mining Company.—At the annual meeting recently held, John Trever was elected president; Ernest May, vice-president; R. H. Driscoll, secretary and treasurer.

Milliken Peak.—Development work is being pushed on this property; the tunnel is now in about 2,000 ft. and work is advancing night and day with a double shift. Several small veins have been cut already.

Pennington County.

Keystone Mining and Milling Company.—This company has decided to double the capacity of its mill, which was built about a year ago. When the addition is completed the mill will be able to work 260 tons a day. This step has been taken for the reason that the ore in sight is believed to be sufficient in quantity to keep the mill running.

Seabury-Calkins Mining Company.—The diamond drill is still being operated on the 100-ft. level, driving a horizontal hole in a northerly direction, and the boring is now in 300 ft. For about 200 ft. the drill passed through ore, but for the last 100 ft. it has been cutting a series of dikes of porphyry, interspersed with limestone.

Silver Cliff Mine.—It has been decided to stop drilling and open up the ore body by a shaft. The ore is said to be similar to that found in the Keystone.

UTAH.

Salt Lake Comty.

Stewart No. 1 Mine.—During June this mine produced \$6,000 in bullion, the mill being run 21 days with a force of 22 men. The ore is worked closely and the tailings are cleaned.

Tooele County.

Bullion Mine.—This mine, at Stockton, recently made a shipment of about 350 tons of first-class smelting ore, which is said to carry 50% lead and about 30 oz. of silver to the ton.

VERMONT.

Washington County.

Eureka Granite Company.—This company has a full force at work in its quarries, at East Montpelier, and has orders enough on hand to keep busy for some time to come.

Vermont Granite Company.—This company is putting up several new derricks and a new engine in its quarries, at Graniteville.

VIRGINIA.

Albemarle County.

Hamlett Slate Company.—This company has been organized, with \$100,000 capital, to open slate quarries near Alberene.

Wise County.

Ayers Coal Company.—This company has filed articles of incorporation to mine coal near Big Stone Gap. The capital stock is \$25,000.

Keystone Coal and Iron Company.—This company has filed articles of incorporation, with \$500,000 capital stock, its purpose being to work coal and iron mines near Big Stone Gap.

WEST VIRGINIA.

Harrison County.

A tract of 2,000 acres of land on the line of the new Monongahela Railroad, near Clarksburg, was last week sold to Long & Douglas, of Connellsville, Pa., representing parties in Pittsburg. The price paid is said to have been \$40 an acre. The purchasers intend to put in two or three openings at once, and will also build a number of coke ovens on the property.

Oil.

The Standard Oil Company is preparing to double the capacity of its pumping station, at Morgantown. The plant has now a capacity of 15,000 barrels a day, but is not sufficient to carry all the oil offered by the lines concentrating at that point.

WYOMING.

Sheridan County.

Colorado & Wyoming Mining and Milling Company.—This company has purchased a Bucyrus amalgamator, and will operate it at the Bald Mountain mines.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

It is reported that a promising copper mine has been discovered near Pilot Bay. The vein is 2½ ft. wide and assays of the ore run high in silver.

A great coalfield has been discovered on Queen Charlotte Island. During the year an extensive examination has been conducted by H. E. Parrish, who reports that there are 60,000 acres of coal capable of profitable development. The property has been bonded to English capitalists who have agreed to spend \$70,000 in exploration.

MEXICO.

Monterey.

Grand National Smelter Company.—This company is enlarging the size of all its furnaces as they blow out. The present capacity of each is from 50 to 55 tons per day.

NEW SOUTH WALES.

A find of tin ore is reported to have taken place near the old Stanifer mines. At one place the vein is 3 ft. thick.

Broken Hill Proprietary Company.—A Renter dispatch states that this company has closed down owing to the fall in price of silver. This report would seem to require confirmation, as this company produce silver at a cost of from 40 cents to 45 cents per ounce.

NOVA SCOTIA.

(Reported for the "Engineering and Mining Journal.")

New Egerton Mine.—The first clean-up for the New Egerton company was made on June 27th from 163 tons, which gave 134 oz. gold. This, however, was reduced by smelting to 121 oz. 15 dwts., worth \$19.50 per ounce. The crushing was of four different lots, only one of which was out of a lode worked before, and were therefore trial lots; 7 tons of one gave 4 oz., 6 tons of another 4 oz., and 120 of another, a late discovery, 109 oz. The total cost of labor during month, including manager and storekeeper, only amounted to \$835.

Truro Gold Mining Co.—For the following statement we are indebted to Mr. George W. Stuart, managing director of the company: The company took this mine over from tributors October 1st last, and since then results have been as follows: November, 22 tons quartz crushed yielded 272 oz. gold; December, 30 tons crushed, 749 oz. 16 dwts.; January, 30 tons crushed, 139 oz. 17 dwts.; February, 30 tons crushed, 64 oz. 4 dwts.; March, 30 tons crushed, 48 oz. 19 dwts.; April, 30 tons crushed, 58 oz. 8 dwts.; total, six months, 172 tons quartz worked, yielding 1,332 oz. 4 dwts. gold. Since January the work has been entirely development, and since April no quartz has been raised.

ONTARIO.

Lake of the Woods Districts.

(Reported for the "Engineering and Mining Journal.")

For the following information we are indebted to Mr. F. Hille, mining engineer, of Port Arthur:

Rajah Mine.—In your issue of the 24th ult. appeared a report upon different mines in this district, and among others also one about the Rajah, in which your correspondent says: Two shafts are being sunk, in neither of which pay ore has yet been encountered. In regard to this the manager of the mine authorizes me to say that the two shafts were still on the same ore as that assayed right along. Here are a few assays which were taken from different parts of the vein: Sample No. 1: Gold, 1.2 oz.; silver, 2.5 oz. No. 2: Gold, 2.8 oz.; silver, 21.5 oz. No. 3: Gold, 0.2 oz. No. 4: Gold, 3.4 oz. No. 5: Gold, 14.7 oz. No. 6: Gold, 20.3 oz.; silver, 20.98 oz. No. 7: Gold, 2.4 oz.; silver, 1.1 oz. No. 8: Gold, 10.6 oz.; silver, 12.9 oz. No. 9: Gold, 38.26 oz.; silver, 32.64 oz. No. 10: Gold, 12.6 oz.; silver, 39 oz.

Sultana Mine.—This mine was not treated with fairness in your recent correspondent's report. The Sultana people never had lack of ore, but lately they worked only with a small force, waiting for the completion of the annex to their mill, in which they are going to try the cyanide process for treating the tailings, which assay nearly 1 oz. of gold. If they had room for a dumping ground they would work more, but through lack of space they had even to dump the tailings last winter on the ice in the lake.

Port Arthur District.

Last year a number of gold veins were discovered not more than 50 miles west of Port Arthur which promise well. The veins vary in width from 2½ ft. up to over 40 ft., and the ore assays from \$10 to \$50 in gold and silver. The ore is not free milling, but

is, through the occurrence of a large percentage of copper, a very good material for Dr. Hoepfaer's process.

It is a pity that this district is not more thoroughly prospected; if it were it would soon count among the gold producing countries, but we have no prospectors to speak of, and those whom we have are too poor to equip themselves for a summer's campaign.

SOUTH AFRICA.

Diamonds.

Alluvial diamonds found in the river diggings in the Barkly West district, and picked up by various riparian owners in the Kimberley division, amounted to over 70,000 carats. There are upwards of 3,000 natives employed in connection with the alluvial diggings.

Bultfontein.—Very heavy reef falls took place during the year. Work has been confined to the ground of the Bultfontein, Limited, in the north-eastern part of the mine, 240 claims being worked in the open. There were about 1,119 persons employed. There were 12 killed and 34 injured, of whom not one was a European.

The total quantity of explosives used in the four mines was 310½ tons. The total average labor employed was 1,731 white, and 7,333 colored.

De Beers.—At the end of 1892 the outside rock shaft was down 1,097 ft., and was still in quartzite. The deepest working level in the mine was 1,000 ft. The average quantity of water pumped was 6,922 gallons per hour. Wages ranged from £4 10s. to £6 10s. per week to white men, and 21s. per week to kaffirs in compounds. The average number of persons daily employed was: Above ground, white, 693; colored (including 701 convicts), 2,098; below ground, white, 229; colored, 1,812; total, 4,832.

De Beers Consolidated Diamond Mines, Limited.—This company has declared a dividend of 12½% for the six months ending June 30th. The revenue for the entire financial year ending June 30th, including the diamonds on hand, was £3,380,000, and the expenditure £1,179,000, leaving a gross profit of £2,201,000, and, after providing for interest and sinking fund on debentures and all other obligations, there remains a net profit of £1,673,000, out of which two dividends of 12½% each have been declared, absorbing about £1,000,000. These figures are exclusive of the amount carried forward in the last balance-sheet (£377,500) and of the increase of about 1,000,000 loads in the stock of blue ground on the floors, bringing the total up to about 2,500,000 loads.

Kimberley.—The deepest working level in the Kimberley mine in 1892 was 1,000 ft., and a considerable amount of development was done during the year at this and other levels below the 845 ft. On March 4th a communication was effected between the 1,000-ft. level and the winze sunk from the 845-ft. in blue ground. This enabled all the water to be pumped at the rock shaft by the new plant. No trouble has since been experienced in dealing with the water, and a great saving has been effected in the cost of pumping. The engines below ground used for pumping having been dispensed with, no steam is now sent underground, and the ventilation of the mine is naturally improved. According to the report of the Inspector of Diamond Mines for 1892, the rock shaft is down 1,261 ft., and at a depth of 1,141 ft. the stratum changed from quartzite to metamorphic slate. There is a level going in towards the mine at 1,200 ft. Since April 10th, 1892, a water record has been kept, the average quantity pumped being 13,775 gallons per hour. In 1890 the area of the surface opening in Kimberley Mine was 31 acres. At the level of the hard rock the area of the mine is now 455 acres, of which 269 are worked. The cost of coal per ton of 2,000 lbs. was as follows: English, £8 10s.; Indwe, £3 17s.; and Cypre-gat, £2 11s. 6d. Wood: £2 per 2,000 lbs. Wages ranged from £4 10s. to £6 10s. per week to white men, and 21s. per week to kaffirs in compounds. The average number of persons daily employed above ground, white, 372; colored, 932; below ground, white, 133; colored, 822. Total, 2,309. Dbris washing steadily diminished in quantity. There were 61 white men engaged in it in January, and only 38 in December; the number of natives employed in those months were respectively 578 and 355.

Mashonaland.

The latest accounts from Mashonaland show that developing work is proceeding very satisfactorily now that the dry season has commenced. At Susman's Reef, 14 miles from Salisbury, a panning by the Mining Commissioner gave 1 oz. to the ton. Mr. Susman has ordered a 5 stamp battery from Johannesburg, which will be worked by water, of which there is abundance. Seven tons of ore crushed from the Alice mine by a small mill returned 3 oz. to the ton. At the Guy Fawkes claims, belonging to the Bell syndicate, 100 ft. driving has been done. At the 50-ft. level the reef averages 2 ft. 9 in. The plates look well, and a return of 1 oz. per ton is expected. From Manica the Mining Commissioner reports that on Panhalanga Block, 130 ft. from the surface, a tunnel has been driven exposing four drift reefs, which are undoubtedly a continuation of the Rezende series. One of these reefs is 5 ft. 9 in. thick; another 3 ft., and a third between 5 ft. and 6 ft. One samples 2 oz. 8 dwts., and another 1 oz. 4 dwts. Upon the Inez reef crushing is now continuous, the ore running 2 oz. gold to the ton. At the Rezende property a tunnel, commencing at a depth 200 ft. from the surface, has been driven 600 ft.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see pages 70, 71 and 72.]

NEW YORK, Friday Evening, July 14.

Midsummer dullness reigns supreme over the mining stock market, and in looking over the transactions during the past week we find that on the list of dividend mines there appear only transactions in five different stocks; on the non-dividend, transactions of only four. If business continues to dwindle down as during the past two weeks it is quite evident mining stocks will disappear entirely from the Consolidated Stock and Petroleum Exchange.

The Comstocks, which have always been favorite stocks, notwithstanding the numerous assessments, show but few transactions this week. Consolidated California & Virginia declined from \$1.50 to \$1.35. Ophir shows one transaction at 90c, and Mexican one at 75c. Comstock Tunnel was the most active stock on the list, showing transactions of 3,300 shares at 6@7c.

Moulton, in which generally very little trading is done, this week appears on the list with one sale of 200 shares at 35c.

The California stocks show no transactions, and notwithstanding that Standard Consolidated is now paying dividends and prospects are said to be quite favorable it shows no sales. Brunswick Consolidated is evidently resting on its laurels of the past. The promoters have no doubt exhausted all their schemes, and the dividends which were predicted when the stock was first placed upon the market have not made their appearance, and assessments have been the order of the day.

Horn Silver showed a downward tendency; last week the stock was quoted at \$2.75. A sale of 100 shares this week was made at \$2.40.

The closing of so many Colorado mines has stopped practically all transactions in Colorado stocks. Leadville Consolidated shows, however, considerable life and 1,700 shares were sold at 14@17c. La-crosse remains stationary at 4c. Phoenix Lead, which had not been dealt in for some time, shows a sale of 300 shares at 15c.

The total business of the Exchange amounted to 2,350 dividend shares sold and 4,000 non-dividend, a total of 7,250, against 4,300 shares last week.

Boston. July 13.

(From our Special Correspondent.)

The tendency of the market for copper stocks still continues downward, and prices have reached, in nearly every case, the lowest for the year. A great many stocks have been pressed upon the market under orders to sell at best price, and buyers have had them on their own terms, and many good bargains have been secured which will show handsome profits in the no distant future. The Montana stocks sold this week at prices never before reached in their history, and are without doubt very cheap. Boston & Montana declined from \$19.50 to \$17, under a pressure of stock by weak parties who have been holding them on margins and have been forced to sell. Butte & Boston also declined from \$6 to \$5½, with a fractional recovery.

Calumet & Hecla held quite firm at \$230 on small sales early in the week, but declined to \$275 yesterday when quite a large lot was placed on the market. Tamarack also participated in the general weakness, and dropped \$6 per share to \$133 on forced sales.

Quincy declined from \$107 to \$100 without any apparent reason except the desire to realize the money for other purposes. Osceola was very weak and sold down from \$25 to \$20, with a fractional recovery this afternoon. This stock has not sold at so low a price since 1889. Centennial has been the speculative feature of the week and sold down to \$2 per share, the lowest yet. The short interest is said to be quite large, and an attempt to cover caused a reaction which carried it up to \$3¼@3½, finally settling to \$2½@2¾. About 4,000 shares were dealt in.

Kearsarge declined to 5½ on small sales. Franklin sold at \$10½@10 for small lots. Atlantic declined to \$7 for 50 shares only. Wolverine sold at 1¼, against 1½ the last sale. 3 P. M.—The market closed generally heavy, \$17 was best bid for Boston & Mont.; \$270 hid for Cal. & Hecla, \$275 asked; Osceola offered at \$21, best bid \$20. \$100 was bid for Quincy and \$134 for Tamarack, \$136 asked.

San Francisco. July 7.

(From our Special Correspondent.)

The very low prices that have been ruling in the mining stock market had a further decline yesterday and a general selling out of margin accounts by the brokers was in part responsible for this. This morning the leading Comstocks were in better demand, selling at slight advances on last evening's ruling rates. The steady decline in the price of silver has had a disheartening effect and many of the brokers think bed-rock prices have not been reached. On the other hand the low prices are attracting investors who believe certain stocks to be worth a good deal more than the present selling price and are content to wait.

Of the north end Comstocks Consolidated California & Virginia sold for \$1.35, closing at a 15-cents advance. Ophir sold for \$1.05; Mexican for 60

cents; Sierra Nevada for 45 cents and Union Consolidated for 35 cents.

In the middle group Best & Belcher sold freely at 65 cents; Chollar 30 cents; Gould & Curry at 40 cents; Hale & Norcross 25 cents; Potosi for 65 cents, and Savage for 20 cents.

Of the south end Comstocks and Gold Hill stocks Belcher has been the most active, ranging to-day from 33c. to 41c., and closing steady at 45c. Bullion sold for 15c.; Challenge for 10c.; Consolidated New York for 5c.; Crown Point for 20c.; Kentuck for 10c.; Overman for 15c.; Segregated Belcher & Midas for 5c. and Yellow Jacket for 70c., the latter closing at 90 hid, 95 asked. The Jacket mine shows continued improvement on the 1,100 level, and for this reason buyers took in to-day 3,600 shares.

As few margin holders are now able to hold out during continued depression such as that now existing, the closing out of accounts, while working hardship to many, will clear the air and lead to a stronger market. The market at present, however, is demoralized, and opinion is divided as to what may develop within the next week or two.

London. July 4.

(From our Special Correspondent.)

The silver question has continued to form the chief subject of discussion during the days that have elapsed since my last report. The panic that started June 27th, on the news of the closing of the Indian Mints to the free coinage of silver, came to its crisis on Thursday, 29th, on which day silver was sold at 30d., and silver mining shares sank to an exceedingly low level. The desire on the part of holders to get out at any cost was without sense or reason, for the stocks that suffered most and figured most in the panic were those of the Elkhorn, De Lamar, Jay Hawk and Poorman. The producers would be about the last to close down; in fact more than one depends largely on gold for its income. The magnitude of the panic may be judged by the following changes in prices: June 29th and 30th Elkhorns were sold at 9s. 6d. ex. div.; a week before the price was £1. De Lamars sold at 16s. 3d., as compared with £1 2s. 6d. a week before. Jay Hawks fell from 9s. to 6s. 6d.; Poormans from 8s. 6d. to 7s. All other stocks suffered on sympathy, and even stocks of gold mines fell on pressed sales. The news from the United States and other quarters, of the closing down of silver mines, has strengthened the price of silver, and this has brought back some new strength into the market. This week the prices of some silver stocks have traveled a trifle toward recovery, and Elkhorns and De Lamars are quoted a few shillings above the bottom price of a few days ago.

This week promises to be devoid of business, for the uncertainty in silver is causing a general stoppage of operations. To-day being "Independence Day" there are no American prices, and on Thursday there is the royal wedding; so that everybody on "Change who can is making a holiday during the entire week.

The position occupied by minor stocks and non-dividend-payers is at present, if anything, "worse than the worst imaginable." The only one among them that has found buyers is Holcomb Valley gold, but the price at which transactions are effected is low. The secretary's report states that the new machinery will be in work toward the middle of July.

In the midst of the silver congestion comes the reconstruction of the New Viola Company, Limited, working mines in Idaho, under the new name of the Pearl Mining Company, Limited. It will be remembered that the New Viola Company was formed some three years ago to take over the working of the Viola silver-lead mine, 85 miles from Camas, Idaho. Over a year ago the shareholders and directors found they had been humbugged, and competent authorities sent to examine the mine advised its immediate closure. Under these circumstances the directors considered it desirable to lease a property in the Red Mountain District, near Silverton, Colo., and obtained on November 1st, 1892, a three-years lease of the Pearl and Missouri mines, with the option of purchasing a half interest in them at the expiration of the lease. A good deal of development work has been done at the Pearl mine, and the manager reports the result of working to produce shipping ore assaying 110 oz. of silver, and 2% of lead per ton of 2,000 lbs. Mr. R. W. Hollis, the mining expert, in his report on the Pearl mine, recommends the expenditure of £2,000 in development in order to put the mine on a paying basis. As the money at the disposal of the New Viola company was not sufficient to carry the work to a successful issue, it was decided at the meeting of shareholders held July 3d to wind up the company and incorporate a new company entitled the Pearl Mining Company, Limited, with a capital of £93,750 divided into 75,000 fully paid up ordinary shares of £1 each, and 75,000 10% cumulative preference shares of 5s. each. It is proposed to call up at present only 1s. 6d. of each of the 5s. shares. Every member of the New Viola company will be entitled to one fully-paid ordinary share of £1 on the Pearl company for every two fully paid ordinary shares held by him in the New Viola company, conditionally on his applying for at least one preference share of 5s. for each fully paid up share which he may desire to have allotted to him.

At a meeting held July 4th, in London, the proposed amalgamation of the Poorman Mines, Limited, with the Idaho Milling Company and the South Poorman Mines was decided on unanimously by the

shareholders of the Poorman Mines, Limited. This is an English company working gold and silver mines in Idaho; while the South Poorman Company and the Idaho Milling Company are American companies. Hitherto the product of the Poorman mines have had their ore treated by the Idaho Milling Company, and the product of the South Poorman has been shipped for treatment to Denver. Lately the mining company and the South Poorman have determined on amalgamation, and the milling company has announced its intention of doubling its capacity and of acquiring additional water rights of the only thing left for the Poorman mines to do other than amalgamate would be to erect a mill of their own or ship their ore to Denver. The first alternative would not be satisfactory, as the milling company have acquired water rights which would interfere with the proper working of the mill. They therefore decided to amalgamate on the terms offered, which certainly seem reasonable and favorable. The capital of the milling company is \$200,000, the paid up capital of the South Poorman \$405,000 and that of the Poorman £342,435. In the consolidated company the two former companies will hold the same amount in shares, viz., \$200,000 and \$405,000, respectively, while the Poorman shareholders will be given four shares for every three, so that the total held by them will be \$456,580. The rate of dividend of the Poorman has been 33% uniformly for 18 months, and that of the South Poorman 30%. The Poorman mines will be wound up forthwith, and disappear from the list of English governed American mining companies. One advantage to English holders will be that they will now avoid the income tax.

DIVIDENDS.

Homestake Mining Company, dividend No. 180, of ten cents per share, \$12,500, payable July 25th, at the office of the company in San Francisco, Cal., and at the office of Messrs. Lounsbury & Co., Mills Building, No. 15 Broad street, New York. Transfer books close July 20th and reopen July 26th.

METAL MARKET.

NEW YORK, Friday Evening, July 14, 1893.

Prices of Silver per ounce Troy.

July.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	July.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
8	4'84	33	70½	0.545	12	4'83½	33	70	0.541
10	4'83½	33	71	0.549	13	4'83¼	33	71	0.549
11	4'83½	33½	70½	0.545	14	4'82¾	33½	72	0.557

The demand for silver for shipment has been very large for countries other than India. The supply for this purpose has been very much increased by the Mint declining to buy silver at the market price. The smelters finding that the London market was higher than the price arbitrarily fixed by the Director, have sold freely in that direction. The result is that the Government has not bought one-quarter of the month's legal requirements, and yet the time has half gone. Should the month go by without the Government having bought the quota of 4,500,000 ounces, it does not appear how the Mint department can reconcile its action with the requirements of a mandatory law.

The United States Assay Office at New York reports the total receipts of silver for the week to be 91,000 oz.

Gold and Silver Exports and Imports at New York, Week Ending July 8th 1893, and for Years from January 1st, 1893, 1892.

	Gold.		Silver.		Excess of Exports.
	Exports.	Imports.	Exports.	Imports.	
Week....	\$ 2,000	\$1,157,615	\$1,061,070	\$23,884	\$
1893.....	68,874,842	7,716,389	16,915,295	1,318,222	76,776,529
1892.....	43,861,263	6,522,415	11,994,628	876,621	49,466,855

* Imports are in excess \$118,429.

The imports of gold for the five days ending to-day (July 14th) have been \$879,818, and of silver \$125,720, while the exports for the same period were: Gold, \$2,800; silver, \$760,751.

NOTES OF THE WEEK.

The financial situation throughout the country and especially in New York is improving, notwithstanding a heavy break in the stock market here during the early days of the week.

Money is "easier," but it is still scarce and collections are hard to make. The manufacturers are finding it difficult to continue indefinitely to carry the paper of their customers and pay cash to their workmen, and are generally reducing forces. The prospect now is for heavy reductions in wages in many industries, and especially in the Western mines, many of which must stop at the present, and prospective price of silver unless they can get a heavy reduction in wages. Many who are now losing money in mines which could not make profits at 60 cents an ounce would continue to work if they could get the wages of silver miners down to the rates paid other workmen in the same States, or to the wages of copper and iron miners in Michigan. They say: Since in most of the Western States

hoard costs only \$3.50 a week as against \$3 a week in the East, it seems unreasonable to have to pay miners \$3.50 a day instead of \$1.75 to \$2 as is paid elsewhere.

During the past week there have been importations of gold amounting to somewhat over \$1,000,000, chiefly in small lots. It does not seem probable, however, that the gold imports will reach any considerable figure as long as the balance of trade remains as it is at present. The Bank of England continues to discourage the shipment of gold from London by refusing to give out gold in any form except English sovereigns. The loan committee of the New York Clearing House on July 12th authorized the issue of \$350,000 in loan certificates. Other certificates amounting to \$500,000 were withdrawn, leaving the amount outstanding \$22,665,000.

In the East the stoppage of silver purchases is looked upon as one necessary step in restoring confidence. No doubt it will have much influence in this direction, but the present depression will not all disappear when the Sherman bill is repealed. "Hard times" are ruling in every country—in silver India, in gold Australia, in bimetallic France, in gold England. If it were not for the shock confidence has received here by the fear that this country would be unable to pay its obligations in gold no doubt the influx of foreign capital would have kept our business prosperous notwithstanding the effect of the same causes which have affected the others, but we have been driving out the foreign money that has been invested here and preventing the influx of new capital, and we have been lessening confidence among our own people. We hope before long to be able to record brighter prospects. There is nothing to diminish confidence. This country will maintain its gold payments; it will stop purchases of silver. We wish we could say, "It will buy gold in large amounts," for then we could certainly secure an international agreement for bimetallicism which would give an impetus to industry such as the world has never seen. There is no other country in the world where investments are as safe and profitable as they are here, and that fact will bring us the world's money.

Reports from the different commercial bodies of the country continue to emphasize the demand for the repeal of the Sherman Law. The last to join in this demand have been the Buffalo Merchants' Exchange and the Pittsburgh Chamber of Commerce. Both of these bodies held meetings on July 13th and the resolutions were passed unanimously.

The opposite side has been presented by mass meetings held in Denver and Salt Lake, where resolutions demanding unconditional free coinage of silver were passed. At the Denver meeting some extraordinary speeches were made, so intemperate, in fact, as to warrant a suspicion that the speakers had entirely lost reason under the excitement of the occasion.

The general feeling against silver is becoming more intense owing to the foolishness of the free-coinage advocates. Free coinage is seriously advocated by only a few hairbrained persons who repeat again and again the assertions which have been disproved a thousand times, and who talk of "riding in blood to the hride" unless the rational people who have money to invest or industries to protect will accept their wild theories. Those who earnestly desire bimetallicism, and the establishing of both silver and gold in the world's money, are constantly met with these insane statements of free-coinage advocates, as expressing the views of every one in favor of silver, and are told "that is what those in favor of silver want—we will none of it. Let us settle with these lunatics now."

If everyone who favors the use of silver and gold in money would ask only the appointment of an international commission with power to solve the problem, they would demonstrate their confidence in the justice of their cause, and we would get a just solution, but no one will argue with insane men.

The London papers give out that there was no intention of establishing a final fixed ratio between silver and gold in India; that the 16 pence to the rupee was simply an experiment. The absurdity, the barbarity, at this stage of civilization of "experimenting" blindly with so vital a question when a simple rational and permanent solution could be found if it were submitted to an international commission of experts does not appear to have occurred to the eminent gentlemen who ordered the "experiment."

Domestic and Foreign Coins.

The following are the latest market quotations for the leading foreign coins:

	Bid.	Asked.
Mexican dollars.....	\$.58½	\$.61
Peruvian soles and Chilean pesos.....	\$.53	\$.55
Victoria sovereigns.....	4.87	4.88
Twenty francs.....	3.86	3.89
Twenty marks.....	4.74	4.78
Spanish 25 pesetas.....	4.75	4.80

While there are signs of returning confidence, money cannot be said to be at all easier, as far as commercial requirements are concerned, and this fact necessarily precludes any important purchases, no matter of what, being made, and the markets thus continue to be all more or less of a nominal nature.

Copper.—Fortunately we are still able to report that absence of pressure to sell Lake has prevented the price receding from the figure of 11c. asked by the larger Lake companies, and 10½c. by the smaller and second hand holders. If anything, some of the consumers whose stocks are very low, show more of an inclination to act. Electrolytic copper we have to quote at 10½c. and casting, firmest of all, at 10c. with but little offering. Producers of Arizona pig hold out for prices 9¼@9½c., above the market, feeling sure that ultimately they will be paid their figure. Exports of fine copper and copper matte continue to be very heavy, somewhat influencing the European market. Here consumption appears to have been quite steady, but a decided falling off is anticipated, as orders from the West for wire, as well as brass and rolled copper, are rather scarce.

In Europe prices for fine copper have rather given way, and those for G. M. B.'s have also gradually declined, comparatively little being done in either grade. The market is now rather steadier, and we quote spot G. M. B.'s at £43, and three months prompt at £43 7s. 6d.; refined and manufactured ruling as follows: English tough, £47@£47 10s.; best selected, £48@£48 15s.; strong sheets, £54@£55; India sheets, £53@£54; yellow metal, 4½d.

The following figures give the production, in tons of 2,240 lbs., of copper in the United States and also by the chief foreign mines, and the exports of fine copper from the United States for the month of June:

	June.
Reporting mines in United States.....	11,524
Pyrites and outside sources, U. S.....	1,042
Reporting foreign mines.....	7,935

Total, long tons..... 20,561
Exports from U. S. (fine copper)..... 5,169

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

To	Copper	Matte	Lbs.	\$
To Liverpool—				
S. S. Campania.....	152 bags		202,452	\$9,000
" Alaska.....	7,155 "		780,003	35,000
" Gallia.....	4,173 "		467,313	20,600
" Germanic.....	4,402 "		506,499	26,756
" Tauric.....	6,239 "		730,556	32,500
" St. Enoch.....	2,536 "		270,939	12,000
To Liverpool—				
S. S. Alaska.....	45 casks		56,250	\$670
" Tauric.....	334 pigs		113,994	10,500
" St. Enoch.....	1,132 "		300,050	29,000
" Mohican.....	1,402 bars		419,692	42,378
" Mohican.....	321 pigs		112,286	10,580
To London—				
S. S. Egyptian Monarch..	841 pigs		25,000	\$2,688
To Hamburg—				
S. S. Dania.....	167 bags		24,682	\$2,500
" Columbia.....	285 plates			
" Columbia.....	4 bbls.		2,886	3,000
" Marsala.....	12 bars			
" Marsala.....	94 casks		117,500	12,900
" Marsala.....	197 pigs		56,020	5,600
To Havre—				
S. S. La Bretagne.....	25 casks		31,250	\$3,250
" Tancarville.....	3,216 ingots		56,824	6,400
" Tancarville.....	363 bbls.		453,750	49,900
" Tancarville.....	1,444 bars		225,499	24,805
" La Bourgogne.....	190 pigs		59,185	5,900
" La Bourgogne.....	223 casks		279,250	31,231
" La Bourgogne.....	159 pigs		56,081	5,600
To Leghorn—				
S. S. Weser.....	20 bbls.		25,000	\$2,688
To Naples—				
S. S. Entella.....	137 casks		22,400	\$2,464
To Rotterdam—				
S. S. Fundam.....	509 pigs		168,576	\$16,793
" Obdam.....	1,179 "		392,738	38,200
"	2,344 plates		168,124	16,400
"	108 bbls.		135,000	16,050
"	686 bars		115,500	17,105
"	137 casks		22,596	2,500

Tin.—The price of this metal has been subject to violent fluctuations; the tightness of money caused some odd lots to be forced on the market, the price declining to 18½c.; afterward on a very little buying prices quickly advanced, and close at 19 50c. for spot and 19½@20c. for August. With this metal it is now the same as with everything else: if one must sell, very low prices have to be accepted, while if one must buy, full prices are exacted. Shipments to the interior continue to be made at a fair rate, and stocks here are therefore diminishing from day to-day and will soon be reduced to a normal figure, and this taken in conjunction with the fact that the famous 4c. per pound duty is now effective, causes us to repeat our remark that tin at about present value is a good thing to purchase, particularly as for some time to come we shall be independent of the rest of the markets of the world.

In England prices are somewhat easier, but, on the whole, fairly well maintained, at 82½d. for spot and 81 for three months prompt.

Lead.—The price of this metal has been irregular, although there is very little of it to be had, and smelters are firm in their ideas and hold back in the expectation of prices being higher when consumers' orders become more plentiful. We have to quote 39@39½.

The European markets continue to rule very strong, prices having again advanced considerably to £10 3s. 9d. for Spanish and £10 7s. 6d. for English lead, on the strength of the reported decrease in production in Spain, Greece and Australia, the principal sources of supply, and the fact that England, Germany, etc., can no longer successfully compete.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: Since our last review our market has gradually receded in

conjunction with seaboard markets. The metal seems to have become heavy of its own weight. Owing to the light demand from consumers only carload spot sales from 3'25c. to 3'30c.

Spelter.—Current rumors are conflicting, some being to the effect that the coal miners' strike will soon be settled, and some to just the opposite, but meanwhile, in the absence of orders, the market is very flat and prices have gradually come down to about 4'10@'15 New York. Galvanizers in particular are doing almost nothing at all.

Antimony is dull and depressed in price, which for Cookson's is 10½, for L. X. 10½, and for Hallett's 9½.

Platinum.—The metal continues in good command at \$11.00. No ore is now being offered in this market.

Nickel is lifeless.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 14, 1893.

Pig Iron Production.

Fuel used.	Week ending				From Jan., '92.	From Jan., '93.
	July 14, 1892.	July 14, 1893.	Jan., '92.	Jan., '93.		
Anthracite.....	77	33,738	71	33,699	963,777	906,301
Coke.....	143	128,169	139	133,625	3,676,061	3,614,405
Charcoal.....	46	11,375	34	8,394	275,869	255,006
Totals.....	266	173,281	244	175,718	4,915,707	4,803,712

Pig Iron.—The condition of the pig iron market does not show any material changes from that which we have reported for several weeks past, and we have only to repeat that trade continues dull with demand small, and that buyers are still inclined to purchase only for their immediate requirements. There is no doubt that stocks have been accumulating to some extent, but hardly to the degree which many have been inclined to think, and there is no doubt also that the July report of the furnaces will show a considerable curtailment of production, as will be evident to those who have noted the indications in our industrial and mining news columns. It is doubtful, however, whether this will affect the market, which seems to depend at present more upon general financial conditions than upon the immediate question of a short or over supply of pig iron. Present indications are that the difficulties between the Western manufacturers and the Amalgamated Association will be settled by negotiation, and that the Association scale will be generally accepted with some modifications. Most of the mills in the Pittsburgh district and the Mahoning Valley have shut down for repairs, according to their annual custom, but the stoppage is not likely to be more prolonged than usual.

In this market there are no signs of change, and no pig iron sales of importance are to be reported. There is of course the perennial report that Southern iron is being forced upon the market at very low figures, but it is impossible to definitely place any sales of this kind or to treat the report as anything more than a mere rumor. It is possible, of course, that such sales have been made by furnaces in need of cash, but if so the terms have been carefully kept private.

Cleveland dispatches report the sale of 100,000 tons of Bessemer ore from the Gogebic Range at \$3.75 per ton (at Cleveland); and some small sales of the same class of ore are reported as low as \$3.65 and \$3.70 per ton. Our mining news columns show that the Lake Superior mines are feeling the effect of the depression, and that many of them are making no shipments. The effect of the small demand for iron ores is also shown by a fall in lake freight rates and by the fact that some of the large ore carriers are laying up their ships.

Pig iron quotations at New York may be put about as follows for Northern brands: No. 1, \$14.50@15; No. 2, \$13.75@14.50; gray forge, \$12.50@12.75. For Southern iron we quote: No. 1, \$13.75@14.75; No. 2 F., \$12.75@13.50; No. 1 soft F., \$12.25@14; gray forge, \$12@12.50—all at tidewater. Scotch irons are quoted: Coltness, \$21.50@22; Eglinton, \$19.50@20; Summerlee, \$20.

Billets and Rods.—There is little business doing in this market. We quote: Steel billets, tidewater, \$23.50@24.50; foreign, \$23.50@29; wire rods, \$31.50@32; foreign, \$40@40.50; Swedish, \$52@53.

Manufactured Iron and Steel.—Very little business is doing in manufactured iron and steel, but a better demand for small lots is noted. Prices continue low and unchanged. We quote: Angles, 1'75@2c.; axles, scrap, 1'90@2'10c.; delivered; steel, 1'85@2c.; bars, common, 1'50@1'60c.; refined, 1'65@1'9c. on dock; beams, up to 15 in., 1'80@2c.; 20 in., 2'10@2'30c.; car truck channels, 2@2'10c.; channels, 1'90@2'10c. on dock; hoops steel, 1'8@1'9c., delivered; links and pins, 1'85@2'10c.; plates, flange, 2@2'10c.; firebox, 2'5@2'8c.; flange, 2'10@2'25c.; marine, 2'50@2'75c.; sheared, 1'85@2'10c.; shell, 1'95@2'10c.; tank, 1'75@1'93; universal mill, 1'80@1'90c.; tees, 1'95@1'5c., all on dock.

Merchant Steel.—The market continues dull. Prices are unchanged, being as low as they probably will be. Manufacturers say lower prices mean greater losses. Quotations are: Tool steel, 6'50@6'75c. and upward; tire steel, 2@2'10c.; toe calk, 2'20@2'30c.; Bessemer machinery, 2'10@2'20c.; Bessemer hars, 1'80@2c.; open hearth machinery, 2'20c.; open hearth carriage spring, 2'10@2'20c.; crucible spring, 3'75@4c.

Old Material.—We hear of little business doing in old material. Quotations, in the absence of sales on which to base them, are nominally as follows: Old iron rails \$15.50@16; steel rails, \$11.50@13; car wheels, \$11.50@13.50.

Rail Fastenings.—The market for rail fastenings continues lifeless. Quotations remain: Fish and angle plates, 1.55@1.60c, at mill; spikes, 1.9@1.95c.; bolts and square nuts, 2.45@2.50c.; hexagonal nuts, 2.55@2.60c., delivered.

Spiegeleisen and Ferromanganese.—No business has been done in either spiegel or ferro during the past week. Quotations are nominally as follows: 10 to 12% Spiegel \$22@22.50, 20% \$25@25.50; Ferro, \$57@57.50.

Steel Rails.—Only one or two small sales of standard sections for the week. The market continues very dull. Quotations are unchanged at \$29 mill or tidewater. Girder rails, \$31@33. Steel rails fit to relay can be had for \$19@20.

Tubes and Pipe.—Business in tubes and pipes continues quiet. Ruling discounts on carload lots are as follows: Butt, black, 57½, 10 and 5%; butt, galvanized, 50, 10 and 5%; lap, black, 67½, 10 and 5%; lap, galvanized, 57½, 10 and 5%.

Buffalo. July 13.

(Special Report of Rogers, Brown & Co.)

The market has reached a more lifeless period than at any time we remember. Very little iron is being shipped on old orders and new ones are few and small. No attempts are being made to force sales, as all recognize the futility of crowding on a market that won't take.

Furnaces are accepting the situation, taking such orders as they can get at market rates, and dropping out of the active list as their stock piles become too large to carry comfortably.

We quote for cash f. o. b. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, \$14; No. 2 X foundry strong coke iron, Lake Superior ore, \$13.25; Ohio strong softer No. 1, \$14; Ohio strong softer No. 2, \$13.25; Jackson County silvery No. 1, \$17@17.30; Jackson County silvery No. 2, \$16.30@16.60; Lake Superior charcoal, \$16; Tennessee charcoal, \$16; Southern soft No. 1, \$13.65; Alabama car wheel, \$18; Hanging Rock charcoal, \$20.50.

Chicago. July 13.

(From our Special Correspondent.)

Agents here report increased depression in the ore market, but few contracts have been made and more mines are closing down in the Lake Superior region. This stagnation in the ore trade has caused many boats to tie up or has forced them into the grain-carrying business at low rates, so that the continued dullness in the iron trade is far-reaching in its effects. The Illinois Steel Company, having signed the amalgamated scale, subject to certain modifications, started up their rolling mills at Bay View, Milwaukee, Wis., July 10. The smaller mills, 12-in., 9-in. and 8-in., will remain inactive for the present. Probably the more prominent features of the situation are the low prices of pig iron, the closing down of the ore mines in the lake districts and the blowing out of blast furnaces north as well as south. Thus there is curtailment and restriction in output all around, and while as yet there are no apparent effects they may be seen later in the year. There is, however, a better tone to the inquiry for crude iron, and an easier feeling among consumers who are taking small quantities more freely. Manufactured iron and steel is in much the same condition as for several weeks past.

Pig Iron.—Continued quietude is noted for coke iron and furnaces are inclined to accept offers for material at a little less than ruling rates. A moderate demand obtains for local coke iron in small lots and the aggregate tonnage is fair as compared with the previous week. More confidence is being gradually developed, but the smaller consumers insist on keeping their stocks narrowed down and are not willing to abandon their hand-to-mouth policy for the present at least. Southern coke iron is in better inquiry, but so far without any sales of note. Several furnaces have instructed selling agents to advance prices on No. 2 foundry 15@25c. per ton and to make quotations subject to prompt acceptance only. Others have made offerings lower and little doing outside of carloads. Lake Superior charcoal iron is being offered by some holders at \$15 to equalize, but sales are light.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, \$16.00@16.50; Lake Superior coke, No. 1, \$13.50@13.75; No. 2, \$12.75@13.25; No. 3, \$12.25@12.50; Lake Superior Bessemer, \$14.00; Lake Superior Scotch, \$14.50@15; American Scotch, \$15.50@16.50; Southern coke, foundry, No. 1, \$14.00; No. 2, \$12.35; No. 3, \$12.00; Southern coke soft, No. 1, \$12.75; No. 2, \$12.50; Ohio silveries, No. 1, \$16.50; No. 2, \$16.00; Ohio strong softeners, No. 1, \$16.25; No. 2, \$16.00; Tennessee charcoal, No. 1, \$17; No. 2, \$16.50; Southern standard car wheel, \$18.50@19.

Structural Iron and Steel.—Demand is entirely confined to small lots of beams and other building shapes. Bridge plates and bridge material are in moderate inquiry. Quotations, car lots, f. o. b. Chicago, are as follows: Angles, \$1.75@1.85; tees, \$1.95@2.05; universal plates, \$1.75@1.85; sheared plates, 75c.@1.85; beams and channels, \$1.80@1.90.

Plates.—Mill business and warehouse orders are equally light in character, and prices are easy as quoted. Steel sheets, 10 to 14, \$2.25@2.35; iron sheets, 10 to 14, \$2.20@2.30; tank steel, \$1.90@2; shell iron or steel, \$2.50@2.75; firebox steel,

\$4.25@5.25; flange steel, \$2.74@3; boiler rivets, \$4@4.15; boiler tubes, all sizes, 65%.

Merchant Steel.—Carload orders from mill are frequent, but season's contracts are slow, many implement makers inclined to wait awhile. Quotations are: Tool steel, \$6.50@6.75 and upward; tire steel, \$2@2.10; toe calk, \$2.30@2.40. Bessemer machinery, \$2.10@2.20; Bessemer bars, \$1.00@1.70; open hearth machinery, \$2.25@2.30; open hearth carriage spring, \$2.10@2.20; crucible spring, \$3.75@4.

Galvanized Sheet Iron.—Orders are fair, but here is no activity, and discounts, though unchanged, are easy at 70, 10 and 5% off on Juniata and 70, 10 and 10% off on charcoal, and jobbing quantities at 70 and 7½% off on the former and 70 and 10% off on the latter.

Black Sheet Iron.—Orders are few and far between and limited to occasional carloads. Quotations are unchanged at 2.80c. for No. 27 common, Chicago. Jobbers quote 3c. for iron and 3.10@3.15c. for steel, same gauge.

Bar Iron.—There are a number of consuming manufacturers who are still holding off in expectation of lower prices. Several contracts were closed this week at satisfactory figures to buyers. Several specifications for car iron are being figured on and will be placed in a few days. Regular quotations on mill lots are 1.45@1.50c. base. Warehouse trade is quiet at 1.65@1.75c. on iron and steel bars.

Nails.—The situation in wire nails is more encouraging to mills, as stocks are already badly broken at their warehouses. Inquiry is better, and \$1.45 base is firm. Jobbers note a fair demand at \$1.55. Steel cut nails are very quiet, but price stiffer at \$1.23 base; jobbers quote \$1.35 from stock and demand light.

Steel Rails.—The demand still continues light, but from the character of the inquiry now being received by the steel company here, they are disposed to take a more encouraging view as to larger orders from railroads in the near future. Just as soon as the financial skies become clear business in standard sections will improve. Quotations are steady at \$30@31.

Scrap.—Nothing doing in either buying or selling and prices are only nominal. Railroad, \$13.50; No. 1 forge, \$12; No. 1 mill, \$9.00; fish plates, \$14.50; cast borings, \$5.00; wrought turnings, \$7.50; axle turnings, \$9.50; machinery castings, \$10; stove plates, \$1.50; mixed steel, \$9; coil steel, \$15; leaf steel, \$15; tires, \$14.50.

Old Material.—Some railroads are getting anxious for bids on rails and other material, but neither consumers nor dealers care to bid, and iron rails are nominal at \$16.50, but doubtful if the former would pay it. Old steel rails are very quiet at \$10.25@13.50; car wheels dull at \$14.50.

Philadelphia. July 13.

(From our Special Correspondent.)

Pig Iron.—Efforts have been made by some representatives of Virginia iron makers, as well as by some parties representing Pennsylvania furnace companies, to make contracts for a large amount of both foundry and forge iron for delivery during the next three or four months. The terms are private, at least no quotations have been made public, and it is intimated that on forge iron especially concessions have been made sufficient to attract some millmen, who expect to start up perhaps next week. Brokers are taking advantage of the fact of a heavy and sudden decline in production, and they are also furnishing a list of furnaces that will soon blow out; some go so far as to say that the production of iron in this country will drop to 140,000 tons before long. All these arguments have had no effect so far and buyers will simply wait and buy when they are obliged to. Quotations for best foundry are given to-day at \$15. There is nothing to be said about forge, as resumption is not talked of at the mills, but very good iron can be bought at any time at \$13, or a little under.

Steel Billets.—Efforts have been made by manufacturers of billets to make some big sales for the next three or four months. The reason for their anxiety in this matter is not apparent. They are making very little head way because they are offering no inducements, and say with present prices for ore, coal and labor, that concessions are out of the question.

Merchant Iron.—This article might be safely omitted; the stores report very little business; the mills, of course, have no inquiries; repairs have been completed at some mills, and can be completed in all in a few days. The manufacturers still say that bar iron must go up a little on account of the advance in pig.

Nails.—Nails are likely to be a drug; one reason is that building operations have fallen off rather suddenly. Buyers are disinclined to make purchases excepting in a retail way from stores.

Skelp.—Two or three skelp iron manufacturers are out canvassing for business, through brokers, but there is none to be had.

Wrought Iron Pipe.—There are two or three enterprises under way, which, if no obstacles intervene, mean big business for some of the pipe mills.

Sheet Iron.—The only report from those familiar with the sheet iron trade is that some of the mills will probably resume next week, with some orders. There is very little stir in the market at present,

and buyers are, as a rule, supplied with enough to keep going for the present. There are inquiries in hand for a few lots of very heavy plate for special purposes.

Plate & Tank.—The big order for the Bourse is hanging fire; it will probably go through all right. This week's business in plate iron amounted to the placing of a few supplemental orders, to finish old contracts on hand. The manufacturers say this is going to be a good fall for the plate mills; but there is no particular ground for saying so. Ordinary tank is 1.75.

Structural Material.—The structural material market is, of course, very quiet at present. Nearly all mills have some heavy contracts on hand. About all the stuff has been delivered for the Pennsylvania trainshed. There are some big orders in sight for bridge work, which the brokers think will go through all right.

Steel Rails.—The talk now is that a number of railroad companies will be in the market for rail supplies; but that is all that can be said at present. Whatever activity there is to be in railroad building will soon develop. As matters stand to-day, the outlook is rather discouraging. Light sections are selling, and likely to sell, very well.

Old Rails.—The old rail market is very dull. Both old rails and scrap are coming in, and offered much faster than the market can take them.

Pittsburg. July 13.

(From our Special Correspondent.)

Raw Iron and Steel.—Trade in the various departments continues very dull; this, however, is not unusual at this season of the year. The current demand for iron and steel products is of small proportions, and there seems to be no disposition on the part of buyers or sellers to force business to any extent. The present rate of production of pig iron is probably as low as it has been at any time since the first of the year, many of the furnaces being blown out or hanked in anticipation of the contraction of the demands with the stoppage among the mills.

There is talk of a concerted move on the part of the Southern producers to bank their furnaces for a stated period. While this action would have a beneficial effect in clearing the situation in general it is thought that it would not have as much hearing in this section as in some of the Western markets. The Eastern mills are not run by the Western scale, the rates there being considerably below those paid in the West.

The general outlook is not very encouraging, at least to manufacturers, and it looks as though it would be some time yet before there is any activity. There is some inquiry for materials of various kinds, but not of a character that indicates any great desire to place orders. Consumers are anxious to see how the market looks, rather inclined to hope that prices are firmer, and yet not disposed to bid for anything that is not immediately required. Even buyers are anxious for a turn in the market, but they will do nothing to help it along until it begins to move. Under these circumstances it is probable that it will continue dull for a while longer, as there is really nothing to start the market with except the usual run of small orders. The curtailment of production in pig iron will keep that end of the market steady, but the early termination of the dispute in regard to wages, and the concessions on the part of labor, will not help finished material, but the reverse. This ought not to be; but as there is no more business than there was before and there are just as many people competing for it the chances are that what little is gained in labor will be thrown away in the extra effort to secure work for the mills.

The scale question seems to be drawing to a close. There is some mystery about the meetings of Jones & Laughlin and the Amalgamated Association. The firm demanded a reduction from 5 to 30c. The scale has been signed by them, with some changes, but the actual figures cannot be obtained. All parties who have signed in deed received certain concessions.

Coke Smelted Lake and Native Ore.		Steel Billets and Slabs.	
Tons.	Cash.	Tons.	Cash.
1,000	Bessemer City furnace, July... \$13.50	500 B., July, at mill...	\$21.75
1,000	Bessemer City furnace, August... 13.50	500 B., spot, at mill...	21.75
1,000	Bessemer City furnace, July... 13.50	500 B., July, at mill...	21.50
1,000	Bessemer, July... 13.50	350 B., prompt, at mill...	21.40
1,000	Bessemer, August... 13.25	300 B., July, at mill...	21.50
600	Gray Forge, July... 12.00	Muck Bar.	
500	Gray Forge, July... 12.00	500 Neutral, July...	22.00
500	Bessemer, July... 13.35	500 Neutral, August...	22.50
300	Bessemer, July... 13.50	Steel Wire Rods.	
200	No. 2 Foundry... 13.00	500 American fires at mill...	27.50
150	No. 1 Foundry... 14.00	Sheet Bars.	
150	Off Bessemer... 12.75	250 S. B., at mill...	27.80
75	No. 1 Silvery... 15.75	Skelp Steel.	
75	No. 2 Silvery... 14.75	3,400 Wide Gr'v'd... 140 in	
50	No. 2 Foundry... 12.75	Skelp Iron.	
50	No. 2 Foundry... 13.00	400 Sheared... 162½ 4m	
Charcoal.		300 Wide Gr'v'd... 142½ 4m	
150	Warm Blast, off grade... 15.00	250 Narrow Gr'v'd... 142½ 4m	
100	No. 2 Foundry... 18.50	Ferro-Manganese	
50	No. 1 Foundry... 19.80	100 80% Delivered...	\$57.60
50	Hot Blast, off grade... 16.00	Old Rails.	
50	Cold Blast... 26.50	450 Iron Rails, Standard...	18.25
50	Cold Blast... 25.00	350 Iron Rails, Light sections...	17.25

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 14.
Statement of shipments of anthracite coal (approximate) for week ending July 8th, 1893, compared with the corresponding period last year:

	July 8, 1893.	July 9, 1892.	Difference.
	Tons.	Tons.	Dec.
Wyoming region.....	340,281	428,065	87,684
Lehigh region.....	121,152	123,915	2,763
Schuylkill region.....	199,250	205,571	6,321
Totals.....	660,783	757,551	96,768
Total for year to date..	21,789,651	20,417,059	Inc. 1,372,592

PRODUCTION OF BITUMINOUS COAL for week ending July 8th and year from January 1st:

	1893.	1892.	Difference.
	Week.	Year.	Year.
Shipped East and North:			
Phila. & Erie R. R.....	779	47,684	46,905
Cumberland, Md.....	61,921	2,074,244	1,162,169
Barclay, Pa.....	590	31,745	105,718
Broad Top, Pa.....	6,073	339,231	293,208
Clearfield, Pa.....	48,633	2,190,866	2,083,236
Allegheny, Pa.....	22,815	679,513	638,320
Beach Creek, Pa.....	27,841	841,663	1,315,825
Pocahontas Flat Top.....	50,783	1,516,770	1,189,664
Kanawha, W. Va.....	66,721	1,650,241	1,289,683
Total.....	289,782	9,393,957	8,127,740

	1893.	1892.	Difference.
	Week.	Year.	Year.
Shipped West:			
Pittsburg, Pa.....	18,701	678,894	676,868
Westmoreland, Pa.....	30,081	1,062,019	845,522
Monongahela, Pa.....	10,422	403,297	301,030
Totals.....	59,207	2,144,210	1,823,420

Grand totals..... 348,989 11,538,167 9,951,160

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending July 8th, 1893, and year from January 1st, in tons of 2,000 lbs.: Week, 73,315 tons; year 2,755,513 tons; to corresponding date in 1892, 2,891,778 tons.

Anthracite.
The dullness which last week was due to the holiday still continues. It is now largely due to the fact that the companies are enforcing the circular rates and have refused to accept orders for delivery during the balance of the month on anything but the July circular. For the first 10 days of the month sales were generally on the June circular, and it is probable that a good many orders will be carried over and deliveries made during the balance of the month, but all new sales are said to be at the advanced rates. The weekly output of coal is certainly greater than the market is able to take at present, and the 2,000,000 tons allotted for this month is in all probability too great. Of course July is always a dull season for the domestic demand, but dealers report it duller than usual. Many persons who are in the habit of putting in their winter supplies in warm weather are holding back, believing that it will be impossible to hold anthracite at the present high figure, and that there will be a break later in the season. For the price has now reached the point where for manufacturing purposes bituminous is likely to supplant anthracite. Retailers complain of slow collections and are inclined to limit credit as much as possible. It is hardly probable that there will be any improvement in the market for several weeks to come. The total tonnage for the week ending July 8th is reported at 981,289 tons, making shipments for the year 21,128,666 tons, against 19,659,568 tons for the same period last year, an increase of about 7%, about all of which is represented by stocks on hand. The Reading Railroad system reports that its coal shipment (estimated) for week ending July 8th was 335,000 tons, of which 25,000 tons were sent to Port Richmond and 40,000 tons were sent to New York waters.

The Reading official circular rates are as follows, f. o. h. at New York harbor shipping ports:

	Broken.	Egg.	Stove.	Chestnut
Hard white ash.....	\$4.00	\$4.25	\$4.60	\$4.60
Free white ash.....	3.90	4.15	4.60	4.60
Shanokin.....	4.50	4.80	4.60	4.60
Schuylkill R. A.....	4.50	4.95	4.75	4.75
Lykens Valley.....	5.00	5.80	6.20	4.45
Pea, \$2.50@2.75; No. 1 buckwheat, \$1.75@2.00; No. 2 buckwheat, \$1.50.				

Rates at Port Richmond for shipment are 25c. per ton below these figures.

NOTES OF THE WEEK.

The Reading receivers' certificates are to be issued in a few days and it is said that arrangements have been made to place them all. At the same time it is still a possibility that the necessities of the receivers, in spite of the issue of certificates and the arrangement of the Speyer loan, may compel the company to force some of its accumulated coal on the market. It would not be well, however, for consumers to reckon on this.

The demands of the trainmen on the Lehigh Valley for an increase in wages have been refused. At the latest accounts the grievance committee was in session and had asked for another conference with the Reading authorities. It is hard to see how a strike of the trainmen at the present time would benefit them.

The Mahany plane on the Reading has been shut down on account of the light trade, and it is expected that no coal will be sent over it for several weeks.

We note several statements of transfers of shipments from the Reading to the Pennsylvania road. Nothing has been said lately, but it would seem as if the Pennsylvania had made up its mind to adopt a more aggressive policy than heretofore in the anthracite trade.

Bituminous.

The soft coal trade is dull as usual at this season of the year, most of the companies being short of

ders. While the high price of anthracite gives the soft coal men some chance to increase their deliveries to tidewater consumers, on the other hand, the general dullness in business and the shutting down of number of manufacturers have reduced the demand. No improvement in the market can be expected until after Congress meets and business generally has been put on a steadier basis.

The car supply on nearly all the roads is good and there is little complaint about transportation. So far the passenger traveling westward has been lighter than expected and the railroads have been able to handle their coal traffic without difficulty both to tidewater and westbound.

At this port vessels are in good supply and are offered freely at the rates given last week, perhaps a little shaded in some cases. We quote as follows: From Philadelphia to Boston, Salem and Portland, 75c.; to Portsmouth, 80c.; Sound ports, 70c.; Wareham, \$1; Bath, 70c@80c.; Gardiner, 80c@90c. alongside and to wages; Bangor, 90c.; Baltimore rates are 10c. above Philadelphia rates, but vessels are scarce.

Boston.

July 12

(From our Special Correspondent.)

Just now the coal market contains little that is interesting or new. Trade is very quiet. It is much more so than it was a year ago this time. July usually is a dull month, and dealers expect to see a lull in business; but the market seems to be going through more than the dull stage, it being actually dormant. The fact that dealers have but light stocks, probably sufficient to carry them through the summer does not seem to stir them to buying. Those in close touch with the dealers say that they have not much confidence in the present combination of the companies, and have but little belief in their ability to keep up prices the latter part of the year. If the dealers only hold off long enough they think they will be able to make the companies weaken. Individual operators in fact are making concessions of 10 or 15c. per ton. The companies' circular prices are still well maintained. Prices quoted here are those f. o. b. New York: Stove, \$4.45; egg, \$4.10; free broken, \$3.85; chestnut, \$4.45. Lykens Valley (at Philadelphia), broken, \$4.90; egg, \$5.55; stove, \$6. and chestnut, \$5.90.

There is about as little doing in soft coal as hard, yet there is a gleam of hope, as there is beginning to be more inquiry, especially for cargo lots. Some of the railroads here in New England are still holding off either for an easier money market or what they may consider lower prices. The continual decline in freight rates is surely bringing prices more in their favor every week. To-day Cumberland is worth \$3.75; New River and Pocahontas, \$3.65, and Clearfield, \$3.35. Freight rates are getting easier from week to week, being lower now than they have been at any time this year. Rates are: From New York, 60c@75c.; from Philadelphia, 70c.; from Baltimore, 75c@80c.; from Newport News and Norfolk, 70c.; to Sound points, 60c.

The retailers are moving very little coal from their yards just at present. They manage to maintain prices pretty well. Prices quoted here are: Stove, \$6.25; nut, \$6.25; egg, \$6.00; furnace, \$5.75; Franklin, \$7.75; Lehigh egg, \$6.25; Lehigh furnace, \$6.00; soft coal, \$4.25.

The receipts of coal at the port of Boston for the week ending July 8th were 51,675 tons of anthracite and 21,797 tons of bituminous, against 59,421 tons of anthracite and 8,279 tons of bituminous for the corresponding week last year. Since January 1st the receipts have been 998,761 tons of anthracite and 578,746 tons of bituminous, against 1,089,959 tons anthracite and 353,064 tons bituminous for the corresponding time last year. The receipts from the provinces so far this year have been 6,450 tons bituminous.

Buffalo.

July 13.

(From our Special Correspondent.)

The anthracite coal trade continues very dull. Bituminous coal in good demand for manufacturing purposes, but much quieter for vessel use; supply ample and prices steady. Coal shipments by lake thus far this week are light. The outlook for the freight business generally on the lakes is becoming more serious every day; many boats are tied up and others are to be retired unless a change in the situation occurs soon. The Lackawanna coal shutes and trestles are partially closed to business, as there is nothing to do and no coal to ship. All the principal Western and Northwestern receiving ports are filled up with coal, especially Chicago. The Philadelphia & Reading coal shutes are shut down to all boats but their own. There is plenty of coal here. Grain is being brought down from Duluth to this port for one cent per bushel, and from Chicago and Milwaukee at about the same rate.

The Poor Department of our city has advertised for bids for coal; proposals will be received until Saturday next.

The Board of Public Works of this city, in answer to advertisement, received three bids for supplying the municipal building and public schools with 4,000 net tons of anthracite coal and 200 cords of wood, as follows: Messrs. Joseph Gavin & Co. for municipal building grate, \$4.83; egg stove and chestnut, \$5.12; for public school grate, \$4.76; egg stove and chestnut, \$4.99; wood free of charge. Messrs. John & W. H. Ball, for municipal building and public school grate, \$4.39; stove, egg and chestnut, \$4.61 and 15c. per ton extra for housing the coal. Messrs. Thomas Loomis & Co., for municipal building, grate, \$4.47; egg, stove and chestnut, \$4.69; for public schools, grate, \$4.23; egg, stove and chestnut,

\$4.49, and pea, \$3.25. The latter was the lowest bid, in the aggregate about \$1,700, and will, doubtless, be accepted if the quality is up to the standard required.

The shipments of coal by lake westward from Buffalo for the week ending July 8th were 79,610 net tons, distributed as follows: 14,825 to Chicago, 19,750 to Milwaukee, 15,500 to Duluth, 2,100 to Ft. William, 11,240 to Superior, 960 to Saginaw, 600 to Kenosha, 300 to St. Clair, 700 to Menominee, 900 to Hamilton (L. O.), 2,300 to Ashland, 2,705 to Toledo, 750 to Amherstburg, 675 to Bay City, 600 to Detroit, 2,055 to Racine, 15 to Port Burwell, 500 to Green Bay, 735 to Saranac, 2,000 to Gladstone and 400 to Sarnia. The rates of freight were 50c. to Chicago and Sheboygan; 55c. to Racine and Kenosha; 45c. to Milwaukee; 40c. to Portage, Fort William, Saginaw, Saranac, Green Bay, St. Clair, Amherstburg and Menominee; 35c. to Port Huron, Sarnia and Bay City, and 30c. to Detroit, Windsor, Duluth, Superior, Ashland, Gladstone and Toledo.

Chicago.

July 13.

(From our Special Correspondent.)

As we predicted two weeks ago the anthracite coal trade is to-day in great danger of a general demoralization of prices. Certain of the larger interests represented here are openly charged with cutting the circular for all classes of trade, car coal, yard coal and at retail. On the former of these trades this has been particularly true for what is known here as the Mississippi River trade. We hear to-day, however, that all have received the most positive orders from their Eastern superiors to immediately stop their competition warfare and maintain July circular rates. The financial situation at present is not conducive to such prices as are demanded by July circular, and the necessities of some of the trade for money would be a very good excuse for tearing down the bulwark it has taken 15 months to build to protect the general interests of the anthracite coal trade. Some shippers report a very dull and quiet condition, with little hope of improvement for several weeks.

Bituminous coal, though very quiet, is firmer than it generally is at this season, and while certain grades of coal in large blocks of 100,000 to 200,000 tons are offered at a cut of 10c. less than they were 30 days ago, other coal is wonderfully steady. The continued stringency in money matters and the difficulty experienced in obtaining favors from banks has led to a large curtailment in output from mines marketing their coal here. Few, if any, are making more than half-time, and some only a third to two-fifths time, as it requires a large amount of cash to run mines to capacity. Hence, it can be readily inferred that there is no stocking up. This will undoubtedly create a heavy demand a little later, and it is more than probable that railroads will have difficulty in handling all the business offered them. As a whole the bituminous market is in fair shape.

Coke is still inactive and will continue so until general resumption takes place. Prices though unchanged are easy, and what effect, if any, the ensuing six months' contract between the Illinois Steel Co. and Virginia mining interests will have on Connellsville remains to be seen.

Quotations are: \$4.65 furnace; \$5.05 foundry, crushed; \$5.40 Connellsville; West Virginia: \$3.90 furnace, \$4.10 foundry; New River Foundry, \$4.65; Walston: \$4.65 furnace, \$5 foundry.

Circular prices are at the following rates: Lehigh lump, \$6.25; large egg, \$5.85; small egg, range and chestnut, \$6.10. Retail prices per ton are: Large egg, \$6.75; small egg, range and chestnut, \$6.75.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, \$3.35; Hocking Valley, \$3.10; Youghiogheny, \$3.25; Illinois block, \$2.50; Brazil block, \$2.50.

Pittsburg.

July 13.

(From our Special Correspondent.)

Coal.—Trade is very dull. As regards a rise there has been seasons without shipments from June to November; this may be one of them; all signs have failed so far. Stocks of Pittsburg coal in the lower markets are said to be very light. The amount loaded will exceed 15,000,000 bushels, and should no rise take place it will cost considerable money to watch and pump the hundreds of barges and boats loaded and ready for departure. From this it will be perceived that the coal outlook is not a very rosy one. A 10 or 12-ft. rise in the Ohio would be worth a good deal of money to Pittsburg. The railroad trade continues prosperous.

W. W. O'Neil, John Moren and Thomas I. Wood, of Pittsburg, have bought the controlling interest in Collier, Budd & Co.'s big coal elevator at Cincinnati and will push the business. It is the largest deal for years.

Connellsville Coke is in a very demoralized condition, and prices are away down. Instead of furnace coke selling at \$1.90 at ovens, as quoted, you can make contracts at \$1.35@1.40 f. o. b. at ovens; freights to Pittsburg, 70c. per ton. The war between West Virginia and Connellsville is now on, and will be fought to the bitter end; at the same time the iron men will reap the benefit. Ovens are being shut down at all points and hundreds of men being thrown out of work. Week's shipments aggregated 102,790 tons, distributed in cars as follows: To Pittsburg, 1,735 cars; points East of Pittsburg, 1,450 cars; points West of Pittsburg, 2,225 cars; total, 5,410 cars.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, July 14.

Heavy Chemicals—The market continues dull and we have no sales of importance to note. We note a few changes in alkali and sal soda. Buyers generally are holding off, hoping that the money stringency will cause a decided break in prices, but so far this has not occurred, nor is it likely to do so. They do, however, throw the burden of carrying stocks entirely upon the importer. Prices are nominally quoted as follows: Caustic soda, 60%, 2.95@3.10c; 70%, 2.70@2.90c; 74%, 2.72@2.82c; 76%, 2.90@3.00c. Carbonated soda ash, 48%, 1.25@1.30c; 58%, 1.15@1.25c; Alkali, 48%, \$1.15@1.20; 58%, \$1.10@1.20, according to package. Sal soda, English, on the spot, 0.925c. American '95@1c.; bleaching powder, 2.25@2.37c.

Acids.—There is no change in prices to report this week, and we quote: Acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, \$1.87; in carboys, \$2.25; muriatic, 18", 90c. @ \$1.10; 20", \$1@1.25; 22", \$1.10@1.35; nitric, 40", \$1.42; 42", \$1.50@1.75; sulphuric, 80c. @ \$1.10; mixed acids, according to mixture, oxalic, \$6.30@6.50. Blue vitriol is quoted all the way from \$3.50 to \$3.75; glycerine for nitro-glycerine, 11 1/2 @ 12 1/2 c., according to quality and quantity.

Brimstone.—This market continues very quiet and devoid of features of interest. There are no stocks on the spot. Quotations for shipment are \$19@19.25 for best unmined seconds, and \$18@18.25 for thirds. No sales are being made.

Fertilizing Chemicals.—The market is dull and featureless. Dealers find signs of encouragement in a few new sales, but improvement is prospective rather than real. Still this time of the year is also dull and light sales are a matter of course. There have been no changes in prices and the small stocks on hand are held firm. There have been a few sales of Western blood at prices equivalent to \$2.30 to \$2.55 in New York. We quote this week: Dried blood, \$2.30@2.35 per unit for high grade, and \$2.20@2.25 for low grade; azotine, \$2.35@2.40; sulphate of ammonia, \$3.15 for gas liquor, bone liquor is offering at \$3.10. Concentrated phosphate (30% available phosphoric acid), 75c. per unit. Acidulated fish scrap, no stocks on hand; dried scrap is quoted at \$27.50 f. o. b. fish factory. Tankage, high grade, \$27@29; low grade, \$26@28. Bone tankage, \$24@25; bone meal, \$24@25.50.

The price of double manure salts as fixed by the syndicate is as follows: New York and Boston,

\$1.12; Philadelphia, \$1.14; Charleston and Savannah, \$1.17 cwt., basis 48@50%, in 50 ton lots on foreign weights and analyses. Sulphate of potash, 90%-96%, basis 90%; New York and Boston, \$2.07; Philadelphia, \$2.09; Charleston and Savannah, \$2.127, sulphate of potash, 96-99%, basis 90%, is 4% higher. Phosphates.—Quotations for high grade land rock, f. o. b. Charleston are \$4.50@4.75. Freights are \$2.25.

Muriate of Potash.—The market is quiet. The only change from last week consists in a few inquiries from the South for future shipments. The prices fixed by the syndicate for 1893 are as follows: New York or Boston, \$1.78; Philadelphia, \$1.80; Southern ports, \$1.83. Arrivals, 750 tons at all ports and all sold for immediate consumption.

Kainit.—Practically nothing is doing in kainit. Quotations for shipments previous to September are as follows: New York, Philadelphia and Boston, \$8.75 for foreign, invoice weight and test, and \$9 for actual weight; Charleston, Savannah and Wilmington, \$9.50 for invoice weight and test, and \$9.75 for actual weight. Shipments after September 1st, 25c. higher.

Nitrate of Soda.—The nitrate market is dull and prices have slightly fallen, without, however, any increase of business. Quotations are: \$1.75@1.80 for goods on the spot and \$1.80 for futures, with no business to report in the latter. Stocks in Europe have shown a large decrease during the past year.

Messrs. W. Montgomery & Co. in their half-yearly report state that the stocks in Europe have remained at vanishing point in all ports during the past six weeks. Cargoes have passed directly into consumption as soon as they arrived, and it will probably be several weeks before any appreciable quantity of nitrate can find its way into warehouse. The stock to-day in Europe is down to 19,000 tons, as compared with 124,000 tons this time last year. This almost total absence of stock in the ports is a strong feature in the market and one which consumers should not overlook. It is certain to be a great factor in the strength and solidity of the position, which will probably be thereby assured throughout the year. Stocks also in dealers' and consumers' hands are down to the lowest possible ebb. Although the consumption fell off materially during the early months of the year it increased somewhat in May and June, and the result is a total consumption in Europe for the six months of 522,000 tons, showing a fall of 10% as compared with the previous year. This consumption, however, practically represents all the nitrate which had been available. The railway rates question—i. e., of carriage from the nitrate works to the shipping ports—has changed

slightly for the benefit of the producers during the past half-year. The Nitrate Railways Company has expressed its willingness to make a small concession in its rates.

Liverpool.

July 4.

(Special Correspondence of Jos. P. Brunner & Co.)

There are still no signs of improvement in the demand for heavy chemicals, and the market is as dull as ever.

In consequence of the depression in the coal trade, the colliery owners are giving notices to the miners on the 8th inst. of a 25% reduction in wages, which notices will expire on the 28th inst. Unless some compromise is come to before the notices expire, a very extensive coal strike is likely to be the result.

Soda ash is slow of sale and quotations are unreliable, depending upon market quantity, make, etc. For Leblanc makes, quotations are nominally as follows: Caustic Ash 48%, £4 10s. @ £5 per ton; 57 to 58%, £5 10s. @ £5 15s. per ton. Carb. Ash 48%, £4 15s. @ £5 per ton; 58%, £5 5s. @ £5 15s. per ton net cash. Ammonia Ash 58%, dull at about £4 7s. 6d. per ton, less 2 1/2%.

Soda crystals in fair demand at £2 17s. 6d @ £3 per ton, less 5%.

Caustic soda hangs fire and stocks continue to accumulate at works. Quotations are nominally without change, but the tendency is to lower figures. The nominal spot range is about as follows: 60%, £8 @ £9 per ton; 70%, £9 @ £10 per ton; 74%, £10 @ £11 per ton; 76%, £11 10s. @ £12 per ton net cash. For parcels under 10 tons, 5s. per ton extra is charged.

Bleaching powder is well maintained at £8 10s. @ £8 15s. per ton net cash for flatwood packages.

Chlorate of potash is still flat and prices on spot are quite nominal, as there are no buyers. Resellers are reported to be offering at 7 1/2 d. for prompt or July, while syndicate price is 3 1/2 d. We quote: July-December, 7 1/2 d. @ 7 1/2 d.

Bicarb. of soda is steady at £6 15s. per ton, less 2 1/2% for 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia continues very strong, owing to great scarcity, and £13 15s. per ton, less 2 1/2%, is about bottom spot price for 24-25%, in double bags f. o. b. here.

Nitrate of Soda.—The stock on spot being very light has enabled holders to force prices up, and £10 5s. @ £10 10s. per ton, less 2 1/2%, is asked for double bags f. o. b. here. Immediate delivery. These prices are only likely to be very temporary, however, as there are cargoes nearly due.

Carbonate of Ammonia.—3 1/2 d. per lb. for lump and 3 1/2 d. for powdered, less 2 1/2%.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified.

Table listing various chemicals and minerals with their prices, including Acetic, Ammonia, Alum, and others.

Table listing various minerals and metals with their prices, including Bromine, Cadmium, Chalk, China Clay, and others.

Table listing various minerals and metals with their prices, including Marble Dust, Metallic Paint, Mineral Wool, and others.

Table listing various minerals and metals with their prices, including Talc, Terra Alba, Tin, and others.

THE RARER METALS.

Table listing various rare metals with their prices, including Aluminum, Arsenic, Barium, and others.

NEW YORK MINING STOCK QUOTATIONS.

Table with columns for Dividend-Paying Mines and Non-Dividend-Paying Mines, listing company names, locations, and stock prices for various dates in July 1893.

*Ex-dividend. +Dealt in at New York Stock Ex. Unlisted securities. †Assessment paid. ‡Assessment unpaid. §Dividend shares sold, 2,511. ¶Dividend shares sold, 4,700. Total shares sold, 7,211.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Dividend-Paying Mines and Non-Dividend-Paying Mines, listing company names, locations, and stock prices for various dates in July 1893.

Dividend shares sold, 5,339. Non-dividend shares sold, 5,207. Total shares sold, 10,546.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Large table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and amount of last payment, listing various mining companies and their financial details.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, Name and Location of Company, Capital Stock, Shares, Assessments. Lists various mining companies and their financial details.

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood property paid \$275,000 in eleven dividends and the Terra \$75,000. ¶ Previous to the consolidation in August, 1884, the California had used \$31,320,000 in dividends, and the Com. Virginia \$2,390,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$190,000 before the reorganization in 1880. ‡‡ This company acquired the property of the Raymond & Kly Company which had paid \$3,075,000 in dividends. *** Previous to this company's acquiring Northern Belle, that mine declared \$2,400,000 in dividends against \$425,000 in assessments.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Stock Names, July 8-14, and Sales. Includes entries like Am. Coal, Balt. & Ohio, Buff. R. & P., etc.

Total shares sold, 181,530.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Stock Names, July 8-14, and Sales. Includes entries like Adams Express, Am. Cotton Oil, Am. Dist. Tel., etc.

Total sales, 308,348.

CALIFORNIA. San Francisco.

Table with columns for Stock Names, July 7-13, and Closing Quotations. Includes entries like Alpha, Alta, Belcher, etc.

Colorado Springs, July 8.

Table with columns for Stock Names, Bid, Asked. Includes entries like Anaconda Gold, Calumet, Cleopatra, etc.

Denver.

Table with columns for Stock Names, High, Low, Sales. Includes entries like Anaconda, Bangkok-Cora Belle, etc.

COLORADO. Aspen.

Table with columns for Stock Names, July 1, Bid, Asked. Includes entries like Aspen Juniata, Aspen Contact, etc.

MONTANA. Helena.

Table with columns for Stock Names, Bid, Asked. Includes entries like Bald Butte (Mont.), Benton Group, etc.

MARYLAND. Baltimore.

Table with columns for Company, Bid, Asked. Includes entries like Balt. & N. C., Conrad Hill, etc.

MINNESOTA. Duluth.

Table with columns for Stock Names, Bid, Asked. Includes entries like Biwabik M. Iron Co., Cincinnati Iron Co., etc.

Table with columns for Stock Names, Bid, Asked. Includes entries like Adams Iron Co., Agate Copper Mining Co., etc.

Table with columns for Stock Names, Bid, Asked. Includes entries like Kentucky Iron Co., Lehigh Valley Iron Co., etc.

MISSOURI. St. Louis.

Table with columns for Stock Names, Bid, Asked. Includes entries like Adams, American & Nettie Colo., etc.

PENNSYLVANIA. Philadelphia.

Table with columns for Stock Names, Bid, Asked. Includes entries like Bloomington C. & C., Buck Mountain C., etc.

London Quotations.

Table with columns for Buyer, Seller, July 4, 1893. Includes entries like Alaska Treadwell, Alaska Ter., etc.

Paris. June 29.

Table with columns for Stock Names, Francs. Includes entries like Belmez, Spain, Golden River, etc.

New York Mining Stocks.

Table with columns for Stock Names, Bid, Asked. Includes entries like Alice, Alta, Belcher, etc.

ASSESSMENTS.

Table with columns for Company, No., Dlnqt. in office, Day of sale, Amt. per sh/re. Includes entries like Aita, Nev., Best & Belcher, etc.