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UNDERGROUND PHOTOGRAPHY.—ILLUSTRATED SUPPLEMENT.

Our series of illustrated supplements containing views taken by Mr. J. C. Burrow in the Cornish tin mines, and reproduced through his courtesy and that of Mr. William Thomas, who accompanied him and prepared an interesting description of the mines, has, we are pleased to note, already attracted considerable attention from engineers and others interested in mining matters. In view of the difficulties encountered in underground photography the results are in every way remarkable for their clearness and depth, and fully justify the warm praise which has been bestowed upon them.

In response to our request for photographs of underground workings in this country, we have received a number of views, some of them unusually good, and in order to make our series complete we again ask those of our readers who have photographs of mine interiors to forward them to us, so that, if suitable, we may use them in the continuation of this interesting and useful visual description of mining.

If there are any who may desire to try their hands at underground photography, and are unfamiliar with the means by which it may be accomplished, we will be glad to furnish them with information at our command as to the manner in which successful results may be obtained. Of course it is not to be expected that the extensive equipment of flash and lime lights used by Mr. Burrows will be at the command of everyone, but very fine results can be secured with the simple form of flash lamps if properly manipulated.

The Tariff Bill is not yet a law, the President having taken no action. There is no expectation of a veto, however, and in fact the Treasury Department is making all the necessary preparations to put the law into effect. The general expectation is that the President will not sign the bill, but permit it to become a law without his action. In that case the constitutional limit of ten days will expire at midnight on Monday, so that the law will be in effect from August 28th.

As with all general tariff bills, some minor mistakes have found their way in, which will have to be adjusted in a special bill. These do not include any items of much importance. The House bills putting coal, iron ore and sugar on the free list have been buried in committee in the Senate, as was generally expected.

From Europe an increasing demand for copper is reported, all the manufacturers of war material being busy either on orders received or in anticipation of demand from the East. No important changes in prices are yet reported, but futures are stronger, and even if Europe alone is considered this seems to be fully justified. In addition to this also there can be no doubt that the home demand for the metal, which has been so light for a year past, will increase rapidly with general improvement in business, and that the export surplus will be less than it has been. On the other hand the Japanese supply, which has been largely taken by China, will be deprived of that market for the time; but part of this will probably be absorbed by the government arsenals and factories, and the surplus will not be large enough to affect the European market to any extent. The total output of Japan last year, according to the "Mineral Industry," was 18,000 tons, or about 6 per cent. of the world's production, and this has been nearly stationary for some time. The latest news is that the Calumet & Hecla Company has made a large sale for October-December delivery at nine cents, which will block any rise on this market for the present.

In view of the discussion over the eight-hour bill in Parliament, the English "Labor Gazette" recently collected figures showing the number of days' work done by the coal miners in June. Returns were received from 1,000 collieries, employing 248,062 persons, and from these it appears that, taking the number of employees as a basis, there were 7.4 per cent. employed 14 days or less during the month; 55.1 per cent. from 14 to 22 days, and 37.5 per cent. from 22 to 26 days. The highest figures, 26 days, were reached only by 5 per cent. of the whole number, while 0.9 per cent. were employed for 8 days or less. The average number of days worked was 19.6 for all the collieries. This is an overstatement, probably, since the tables given by the "Gazette" show the total number of days on which work was done, without specifying whether a full day was made or not. The month of June was an average one, showing about the usual output, with no special disturbing causes existing to stimulate or check production. It may be assumed, therefore, that the coal miner does not work on the average over three-quarters of his time, while in many cases he works much less. In this respect the Englishman is no better off than his American brother.

The coal-owners generally oppose the eight-hour bill, and it is reported that a large section of the miners themselves do not favor its passage.

The report of the Arizona Copper Company for the six months ending March 31st last, which has just been received from Scotland, is of con-

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siderable interest. Changing the figures into American currency, we find that for the half-year the profits on copper were \$23,009, and the expenses of administration, taxes, etc., were \$20,380, leaving a surplus of only \$2,629. To this must be added, however, profits from the company's stores of \$38,650; rents, \$2,861, and from the railroad \$50,737, making a total of \$94,877. The sum of \$64,516 was required to meet interest on mortgages and debentures, leaving a net surplus of \$30,364 for the stockholders from the half-year's working.

It is interesting to note that were it not for the stores, which show a profit of no less than \$38,650 for six months, the business of the mining company proper would have shown a loss. The question of companies' stores, as well as companies' houses for employees, is always a delicate one. Public attention has again been called to it in connection with the Pullman strikes, and it is possible that we may see legislation at no distant date which will attempt to regulate rentals and profits where laborers are compelled by force of circumstances to become the tenants and creditors of the employer. In Arizona, probably some provision for supplying the employees' needs was necessary.

It seems to have been a wise step for the Arizona Copper Company to erect sulphuric acid works and a leaching plant to handle its silicious ores comparatively low in copper, as the profit on the leaching plant, which has been running but a short time, was one-quarter of the whole profit of the mining operations.

The total production for the six months was 2,360 tons (2,000 lbs. each) of black copper, and the price realized was £85,561, or about 8.79c. per pound.

The Arizona Copper Company is now endeavoring to place an issue of £100,000 of five per cent. "terminable" debentures, which are to fund the various obligations of the company, and to be protected by first mortgage on all the company's property in Arizona, including the railroad.

THE SITUATION IN THE COEUR D'ALENES.

The latest advices from the Coeur d'Alenes is that for the present the region is quiet, owing partly to the presence of three companies of United States troops, who have settled down in their quarters apparently for some time to come. Nothing has been done towards detecting or surrendering those concerned in the recent outrages, and the rewards, amounting to \$7,300, offered for the Kneebone murderers, remain unclaimed.

Several of the larger mines have resumed work under an agreement with the Miner's Union, which has been published, as follows:

"This agreement, made and entered into at Wallace, Idaho, this 30th day of July, A. D. 1894, by and between the Milwaukee Mining Company, the Standard Mining Company and the Coeur d'Alene Mining and Concentrating Company, parties of the first part, and the Central Executive Miners' Union of the Coeur d'Alenes, by Edward Boyce, its president, parties of the second part. Witnesseth: For the purpose of settling the difference existing between the parties of the first part and the parties of the second part, the following agreement has been entered into:

"The present maximum wages of \$3.50 per day shall be paid to all underground men.

"There shall be no discrimination in the employment of men, the men now in the country shall have the preference. No men shall be imported for the purpose of working in the mines.

"The men who lately left the employment of the company, who were objected to, shall not again have employment in any of the above mines.

"It is hereby agreed by both parties hereto that should any differences arise between the parties hereto, that the same shall be settled by arbitration.

"It is the desire of both the above parties that the long-existing differences be and are hereby buried for all time; that henceforth both parties be friends and work for the mutual benefit of both parties.

"In witness whereof we have hereunto subscribed our hands and seals the day and year above written.

"MILWAUKEE MINING COMPANY, A. B. Campbell, Vice-President.

"STANDARD MINING COMPANY, A. B. Campbell, President.

"COEUR D'ALENE MINING AND CONCENTRATING COMPANY, A. B. Campbell, Vice-President.

"A. L. GROSS.

"EDWARD BOYCE, President C. E. M. U.

"Witness: E. H. MOFFITT."

This agreement is probably the most extraordinary document ever signed in this country by employers, and its parallel can, indeed, hardly be found in any civilized nation. Under it the cold-blooded and deliberate murder of the man Kneebone by the Union—for every one in the region knows that the cowardly outrage was perpetrated by the Union—is tacitly endorsed as is also the blacklisting and exile from the country of others. The surrender to the Union is complete, and the companies which signed and actually agreed to employ none of the blacklisted men have virtually surrendered the control of their employees, and submitted, apparently without a question to the dictation of an irresponsible body, whose actions are decided by the voice and votes of the lowest element. What motives are likely to rule can be seen by the uncontradicted statement that the main offense of the men who were run out of the camp was "that they were reserved and unsocial and spent no money in the saloons and gambling-houses."

In return for this abject submission the companies have leave to work and to pay their miners \$3.50 per day, the Union supplying them with men. These privileges, apparently, are all that they have secured by their

surrender, and how long these will continue is uncertain, for in the very nature of things a body of men which has secured as much as the Union has will in due course of time ask for more.

The names of the companies which have signed this extraordinary contract we have given above; but it must be noted that not all the mines have entered into it. Of the larger companies the Hunter, the Last Chance, the Morning and the Sierra Nevada are all shut down, and intend to remain so; and the region is full of idle men who are ready for mischief, and are restrained from further outrages only by the continued presence of the Federal troops. That the withdrawal of the companies now stationed there would be followed by fresh disorder no one acquainted with the situation doubts in the least. That the companies have secured any permanent security by their cowardly surrender no one believes. Differences arising are to be settled by arbitration; but what an arbitration is likely to be in the Coeur d'Alenes can readily be imagined.

We have never questioned the right of workmen to combine for their mutual protection and advantage, nor have we doubted that in many cases such combinations are necessary and beneficial, but in this case the Miners' Union is not an association for the benefit of the members, but rather a conspiracy to perpetuate in the region the rule of the worst element and to put employers and employees alike at the mercy of a gang whose past actions have shown only too clearly what their future rule is likely to be. To speak of such a conspiracy no language can be too strong, and in this case the companies signing the agreement are just as much a part of it as the men, and deserve

quite as severe condemnation. There can be no safety or prosperity for the region until this conspiracy is broken up, the leaders driven out, their followers forced to submit to the rule of law and the domination of the reasonable and law-abiding majority established. Of course this cannot be done without a conflict, but the sooner that conflict is begun and "fought to a finish," the better for the region. Some such work as made Franklin B. Gowen famous in the anthracite region of Pennsylvania years ago is urgently needed in Idaho.

There is also an economic as well as an ethical side to the question. The mines which are running have agreed to pay the same wages to their miners as when both lead and silver were nearly double their present prices. Their competitors everywhere have reduced expenses and are running under schedules which correspond in some degree to the present conditions of the market. Now it is clearly impossible to keep this up for any length of time. If the mines are to keep open they must reduce expenses, and the miners must bear their share of the reduction: the companies cannot long run at a loss which must be continual. The end must come in an entire suspension until better times are reached. From this point of view alone, the companies whose mines are now shut down have taken the wiser course, since their losses in the end will be less than those of the mines which continue to work.

Of course new development in the region is at an end for the time, and none can be expected. New capital will not come under the circumstances, and in fact all capital will soon learn that the Coeur d'Alene region is a good one to stay away from. That capital will in this case be right, who can question?

NEW PUBLICATIONS.

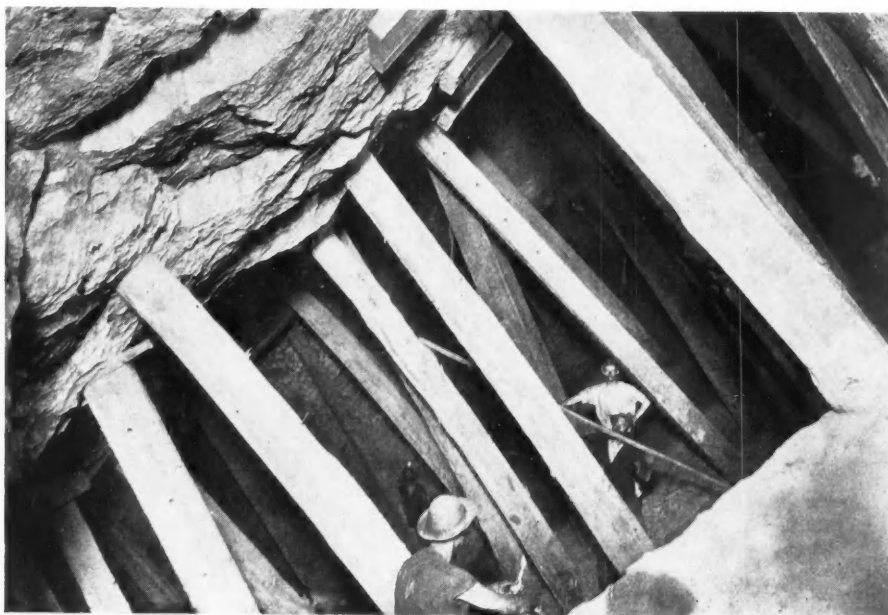
POOR'S MANUAL OF RAILROADS; 1894. H. V. & W. H. Poor, New York. Pages 1,800, with 70 maps. Price \$7.50.

The twenty-seventh annual number of this well-known authority on all matters pertaining to railroads has this year been enlarged by incorporating with it some of the main features of the handbook of investment securities and statements of street railways. The book as presented is one of those invaluable reference volumes which have become as essential to the business man as the dictionary and city directory.

This number is of particular interest, since it gives the railway statistics during a year when, at least in its latter half, the condition of trade was at its lowest ebb. The effect of this condition is shown in the marked falling off in new railroad construction. In 1893 the total increase was but 2,549 miles, the lowest since 1877, and but little over one-half the new mileage in 1892. The most noticeable decrease in new construction was in the Central Northern division, including Ohio, Michigan, Indiana, Illinois, Wisconsin, in which 965 miles were built in 1892, as against 450 in 1893. In the total liabilities of all roads there is shown an increase of \$352,195,089, and in excess of assets over liabilities an increase of \$18,280,793, the total assets having increased from \$11,359,561,019 in 1892 to \$11,730,036,801 in 1893. In passengers carried there was an increase of 53,196,295, or nearly 100% more than the average annual increase in the past five years. In passengers carried per mile of railroad there is an increase from 3,375 in 1892 to 3,627 in 1893, and also in the average number of passenger-miles per passenger train-mile there is an increase from 41.93 in 1892 to 44.80 in 1893, making the latter year the greatest since 1884, with the exception of 1886, when the number of passengers per train was 45.85. In tons of freight moved there has been an increase of 26,859,469 tons, or about the same as the increase from 1891 to 1892, though nearly 25% less than the average annual increase for the past five years. The average number of tons per mile of railroad increased from 4,282 in 1892 to 4,369 in 1893, while the average ton-miles per freight train-mile increased from 161.14 to 170.42.

Taking all of the statistics into consideration it is seen that while in some cases there is less increase between 1892 and 1893 than from 1891 to 1892, in greater part the increase is more, though it is in nearly all cases less than the average annual increase for the past five years.

SUPPLEMENT TO
THE ENGINEERING AND MINING JOURNAL, AUGUST 25, 1894.



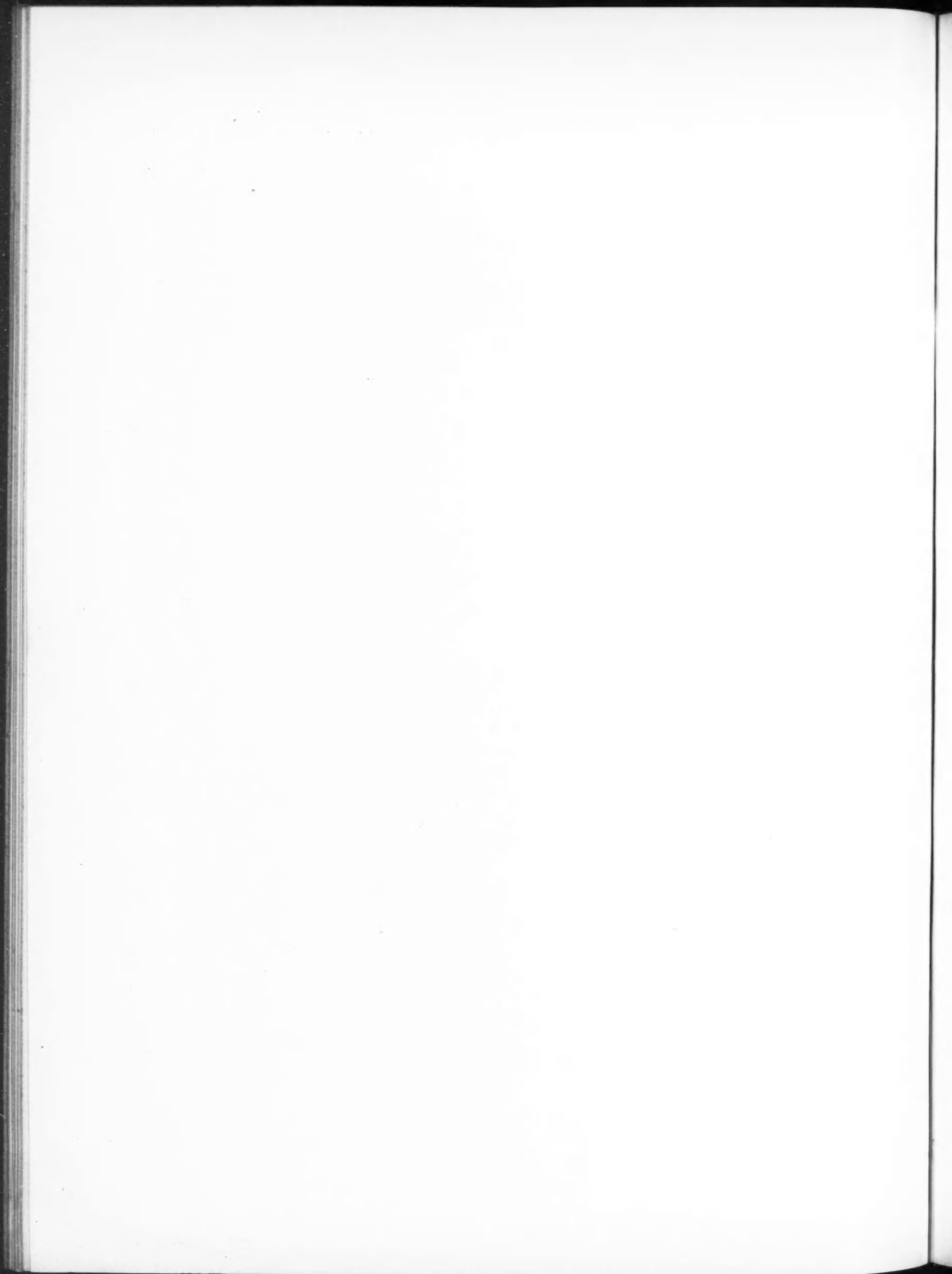
8. ABOVE THE 406, COOK'S KITCHEN MINE.



9. THE 66, BLUE HILLS MINE.

CORNISH TIN MINING IN PHOTOGRAPH.

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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 on another page of the Journal.

- Ecuador: Bulletin No. 64, Bureau of the American Republics. Washington; Government Printing Office. Pages 178; illustrated.
- Proceedings of the Lake Superior Mining Institute: Second Annual Meeting, 1894. Published by the Institute. Pages 112; illustrated.
- Tenth Annual Report of the Inspector of Mines of the State of Kentucky for the Year 1893. By C. J. Norwood, Chief Inspector. Frankfort, Ky.; State Printer. Pages 316; illustrated.

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 Cyanide Assay for Copper

EDITOR ENGINEERING AND MINING JOURNAL:
 Sir: Referring to the communication of Mr. H. Van F. Furman in regard to my warning in the last volume of the "Mineral Industry," as to the possible uncertainty of the cyanide assay for copper, I need only say that my remarks refer so obviously to the "direct" process, without the previous isolation of the copper, that I cannot understand how any one could take them in a different sense.
 Mr. Furman says, "The inaccuracy of this method is too well known to require comment." In this he is quite mistaken. It is, no doubt, thoroughly well understood in most portions of the United States; but it was just because I found it was not entirely understood in some other portions of the world that I went out of my way to give a warning which is very much needed.
 EDW. D. PETERS, JR.
 DENVER, Colo., Aug. 11, 1894.

Imports of Mining Machinery Into Colombia, S. A.

EDITOR ENGINEERING AND MINING JOURNAL:
 Sir: There is an article in your issue of May 26th, to hand by last mail, concerning a comparison of the amounts of British and American mining machinery imported into the Republic of Colombia, S. A., during the year 1891, according to the report of the British Vice-Consul at Bogota. The totals given are 73.9 tons English and 9.8 tons American.
 On referring to our back invoices, I find that this company imported 11.2 long tons of American mining machinery and tools during the year in question. Is it possible that the British Vice-Consul at Bogota is unaware of the fact that Panama is one of the Departments of the Republic and has taken his figures only from the Custom House returns at Barranquilla? The same authority accounts for the preponderance of British machinery to the fact that it is better suited to the local requirements than the American. With all due deference I should be inclined to attribute it to the dearth of American mining companies in the country. I do not know of one such in active operations. Naturally English companies use English machinery, unless some American specialty be required. I presume the same to be the case with American companies. During the year in question this mine was under American local management.
 Yours truly,
 ERNEST R. WOAKES,
 Manager The Darien Gold Mining Company, Limited.
 CANA, via Panama, Colombia, S. A., July 24, 1894.

The Mineral Industry, Vol. II., 1893.

EDITOR ENGINEERING AND MINING JOURNAL:
 Sir: We beg to acknowledge receipt of the second volume of the "Mineral Industry," for which accept thanks. We were very anxious to obtain this volume, and had wired our New York office in order to have same sent promptly, as we desired to obtain information which could only be found in your publication.
 CONSOLIDATED KANSAS CITY SMELTING AND REFINING COMPANY.
 KANSAS CITY, Mo., June 6, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:
 Sir: The "Mineral Industry" is a splendid work, one that should find a place on the book-shelf of every one in any way interested in it.
 BOISE, Idaho, June 6, 1894.
 JOSEPH J. TAYLOR, Mining Engineer.

EDITOR ENGINEERING AND MINING JOURNAL:
 Sir: The second volume of the "Mineral Industry" is truly a wonderful work, with a wealth of information. Allow me to congratulate you upon it. I do not see how you have managed to gather in so short a time so many new and valuable parts. The work is certainly a monument to the industry of yourself and staff. I have examined only the chapters on lead and zinc critically, and even these not exhaustively; but I find they contain much which is of direct use and interest to me in connection with our report on lead and zinc.
 ST. LOUIS, Mo., June 13, 1894.
 ARTHUR WINSLOW,
 Geologist and Mining Expert.

EDITOR ENGINEERING AND MINING JOURNAL:
 Sir: Acknowledging receipt of your "Mineral Industry," for which I thank you, would say I highly appreciate the value of this volume. It is a great work.
 NEW YORK, June 13, 1894.
 EDGAR C. MOXHAM,
 Bertha Zinc and Mineral Company.

EDITOR ENGINEERING AND MINING JOURNAL:
 Sir: Volume II. of the "Mineral Industry" is a worthy successor of Vol. I. It is an immense compendium of valuable matter to all persons in any way interested in these great industries. The labor in collecting and arranging must have been very great. I am gratified to learn of its success.
 JOHN FULTON,
 Mining Engineer.
 JOHNSTOWN, Pa., June 15, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:
 Sir: Some years since, when you succeeded in issuing in an early January number of the "Engineering and Mining Journal" the statistics of the production of the United States for the preceding year, I thought then that you had accomplished a great feat; but that pales in the presence of your success with the issuance of a "Mineral Industry" of the world, which contains not only the recital of facts and tabulated statements of the world's wealth, but also matter which is food for every industry and engineer. The discussions of the past year's progress in metallurgy, etc., make the volume before me invaluable, because comprehensive, concise and "up to date." I do not feel guilty of any platitude when I say that it should be in every office in the United States, whether for reference or for compilation. I confess that we have used liberally of the matter in your Vol. I. for the preparation of our lecture notes, and Vol. II. is far in advance of the predecessor. Such an amazing piece of enterprise is worthy of great praise. I accord it with pleasure, and beg to add my mite of encouragement to the editor.

M. C. IHLESEN,
 Professor of Mining Engineering and Geology,
 the Pennsylvania State College,
 STATE COLLEGE, Pa., June 17, 1894.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

SUPREME COURT OF KANSAS.

Liability for Injury to Mining Employee.—The mere fact that a coal miner engaged by a mining corporation in sinking a coal shaft in the ground is a small stockholder of the corporation will not prevent him from recovering damages for a personal injury caused by the negligence of the corporation. Such a stockholder has no personal control or management of the coal shaft, or of the corporation or its property.—Morbach vs. Home Mining Company, 37 Pac., Rep. 122.

SUPREME COURT OF OREGON.

Location of Mining Claim.

Where the discoverer of a mineral lode, instead of marking out his claim, takes three months in exploring the lode, and some one else, in his absence, makes a valid location on the find, the latter is entitled to the claim, under the statutes, providing that "the location must be distinctly marked on the ground," and the discoverer is not entitled to any time before marking out his claim for exploring his find, in the absence of local custom or statute.—Patterson vs. Tarbell, 37 Pac., Rep. 76.

What Constitutes Possessory Title.

Possession within a mining district, to be protected, or to give vitality to a title, says Chief Justice Wade, "must be in pursuance of the law and the local rules and regulations. Possession, in order to be available, must be properly supported. It must stand upon the law and be a result of compliance therewith. Representation of claim in the manner provided by law and the local rules and regulations of the mining district is the life of the possessory title to such claim. Possession, without a location, carries no title. Possessory titles do not live upon possession alone. They must be supported by a proof of compliance with the law that gives the right to and sustains the possession. The mere naked possession of a mining claim upon the public lands is not sufficient to hold such claim against a subsequent location made in pursuance of the law, and kept alive by a compliance therewith. Hence we say that, upon an issue joined as the forfeiture of the right to the possession of a mining claim, by reason of failure in complying with the rules and regulations of the district, proof of the actual possession, or of the delivery of such possession, from the date of the location to the trial of the issue, if unaccompanied by testimony showing that such possession was taken and held under and by virtue of a compliance with the local rules and regulations of the district, is immaterial proof. . . . There is no grant from the government, under the act of Congress, unless there is a location according to law and the local rules and regulations. Such location is a condition precedent to the grant. Mere possession, not based upon a valid location, would not prevent a valid location under the law." And the Supreme Court of the United States, in affirming this decision, says: "The right to the possession comes only from a valid location. Consequently, if there is no location, there can be no possession under it. Location does not necessarily follow from possession, but possession from location. A location is not made by taking possession alone, but by working on the ground, recording and doing whatever else is required for the purpose by the acts of Congress and the local laws and regulations."—Patterson vs. Tarbell, 37 Pac., Rep. 78.

SCANDINAVIA AS A SOURCE OF IRON ORE SUPPLY.*

By Jeremiah Hoar, M. Inst. C. E.

Sweden and Norway have been known as iron-producing countries for several centuries. Swedish charcoal pig iron, and Swedish bars of great purity, have long been imported into this and other countries; but on account of their costliness, they have been used but sparingly, and only for special purposes. Pig iron to the extent of about 500,000 tons is annually produced at Orebro, Kopparberg, and elsewhere, from about 1,000,000 tons of the rich ores of the central and southern provinces; and the greater part of this is further worked into finished iron and steel. The total number of persons employed in these Swedish industries is about 35,000.

A similar trade exists, but to a very small extent, in Norway. In 1891 one blast furnace remained at work in the whole country, namely, that at Naes, near Grimstad, producing 75 to 100 tons per week of charcoal pig iron. The ore used was self-fluxing, obtained from local magnetite mines. It contained about 50% of iron, and produced a pig in which the phosphorus amounted to 0.035%.

During 1888 Great Britain received from Norway 720 tons of iron ore.

* Abstract of an article read before the British Iron and Steel Institute.

and the imports from that country to the United Kingdom have ever since been quite insignificant. With Sweden, however, the case is altogether different. In 1888 the total exports rose from 41,765 (the figure for 1887) to 117,530 tons, and those to the United Kingdom from 657 to 62,672 tons. This sudden increase was due to the operations of an English company called the Swedish & Norwegian Railway Company (Limited), which had during the previous year made a railway 132 miles long from the iron ore deposits at Gellivara in Swedish Lapland, to Lulea, a seaport on the western shore of the Gulf of Bothnia. The concession included also the right to work and export iron ore from the deposits at Gellivara, Kirunaavara, Luossavara and Svappavara, which lay on or near the selected route, at a royalty of from 6d. to 8d. per ton. Another company, called the Anglo-Scandinavian Steamship Company, closely allied with the railway company, was established to purchase steamers and convey the ore to British and other ports; and a third, called the Magnetic Iron Mountain Smelting Company (Limited), was formed to take on rental and work two blast furnaces at Walker-on-Tyne, belonging to Messrs. Bell Brothers (Limited).

The imports into the United Kingdom fell from 62,672 tons in 1888 to 15,427 tons in 1889, 5,534 tons in 1890, and to 3,108 tons in 1891; and, as far as this country was concerned, the Gellivara mines might just as well have ceased to exist.

The Swedish Government did not regard with complacency the total abandonment of the enterprise. It took over the railway, and, after a time, granted favorable rates to a Swedish company, which established four grades, A, B, C and D, grade A, intended for acid processes, containing about 69% of iron and 0.01% of phosphorus, and grade D, intended for the basic Bessemer process, containing about 65% of iron and 1 to 2% of phosphorus. Ore containing appreciable phosphorus, but not enough to render it unfit for acid purposes, was called grade B, while grade C comprised all between that and grade D.

The yield of the quarries, of which there are 131, was found to be composed of grades A and B to the extent of 20%, while 80% belonged to the lower grades.

The effect of these improved arrangements soon became apparent. The imports of Swedish iron ore into the United Kingdom gradually rose from 3,100 tons in 1891 to 13,722 tons in 1892 and 35,601 tons in 1893. Almost all this was of A quality, and was delivered to furnaces in the Cleveland district at prices averaging 18s. per ton. The imports during the present year are expected to reach 130,000 tons. The general verdict of those who have tried it is that the guaranteed standard of richness and purity has, so far, been well maintained.

That Continental iron companies have been still more enterprising than their English competitors in utilizing the new source of iron ore supply will be evident from the statistics of total exports from Sweden:

During the year.	To Great Britain.		To all countries.		During the year.	To Great Britain.		To all countries.	
	1. From Sweden.	2. From Norway.	3. From Sweden.	3. From Sweden.		1. From Sweden.	2. From Norway.	3. From Sweden.	3. From Sweden.
1870	2,485	1892	.....	.....	.....	20,200	
1871	18,132	1883	.....	.....	.....	22,319	
1872	11,908	1884	.....	.....	.....	40,000	
1873	18,662	1885	.....	613	2,410	25,819	
1874	23,883	1886	.....	743	804	17,288	
1875	27,210	1887	.....	657	2,485	41,765	
1876	14,920	1888	.....	62,672	720	117,530	
1877	12,491	1889	.....	15,427	135	118,571	
1878	13,534	1890	.....	5,534	105	187,332	
1879	12,570	1891	.....	3,108	305	174,148	
1880	29,670	1892	.....	13,722	31	320,871	
1881	24,932	1893	.....	35,601	.....	417,931	

In other words, since 1887, when the Gellivara-Lulea Railway was completed, to December, 1893, the total annual exports have increased by over 400,000 tons, of which 35,000 tons came to the United Kingdom and the remainder went mostly to Germany and Austria.

It will now be obvious to all that during the last six years Scandinavia has become a most important source of iron ore supply to the principal iron producing countries of Europe. The ore travels about 1,680 miles to English (Cleveland) and 1,690 to German (Dortmund) works, and 1,400 miles to Witkowitz. This is farther than from the celebrated Lake Superior mines to the Pennsylvania steelworks. Only very rich ores could bear such cost for transit.

The value of grade A ore, containing 69% of iron and 2% of silica, is at present about 18s. 6d. per ton delivered at Middlesbrough furnaces. Spanish Rubio ore, containing 50% of iron and 8% of silica, costs 12s. 6d. per ton, or 6s. per ton less. But the extra 19% of iron is worth, at say 5d. per unit, 7s. 11d. per ton, and the 6% less silica, at say 1d. per unit, is worth 9d. per ton. Adding these figures and deducting the 6s., we obtain : 7s. 11d. + 9d. - 6s. = 2s. 8d. as the equivalent of the advantage of grade A over Rubio ore to the extent it is used. In other words, the use of A grade ore, under present conditions, should enable smelters to cheapen the cost of production of pig iron for acid steel purposes to a substantial extent.

For the manufacture of pig iron for acid steel processes, there seems to be no doubt whatever but that a valuable new material has now become available in grade A Gellivara magnetite ore. The large and growing importations into Germany, and the five to six years' experience at Witkowitz, seem also to afford sufficient proof that grade D is equally of value in the manufacture of pig iron intended for the Bessemer basic process as carried on in those countries. The question remains, How far can we in England use to advantage grade D, with or without our native phosphoretic ores, and with or without puddlers' tap, in making pig iron suitable for the Bessemer basic process. During the twelve years 1882-93 the production of puddle bar in the United Kingdom has decreased by 53%, and in the Cleveland district by 73%.

The Gellivara deposits are 4 to 5 miles long by 1 to 2 miles broad. The ore in sight, or which can be detected by the dip-needle, covers an area of 160 acres. Borings have been made to a depth of 175 ft. without reaching the bottom. The quantity of ore has not been determined, but there is no doubt that it is enormous; indeed, enough to supply all probable demands for several generations.

The cost of the calcined Cleveland ironstone necessary for the production of a ton of Cleveland pig iron is about 15s. If this were displaced by Gellivara ore yielding 65% of iron, 1½ tons would be required. At the same total cost, 15s. per ton of pig produced, this would admit of the

price of two-thirds of 15s., or 10s. per ton of ore delivered to the furnaces, being paid for it. According to custom-house returns, the lowest average value of iron ore imported from Sweden into the United Kingdom since 1888 is 16s. per ton.

Mr. J. T. Smith, who visited Gellivara in 1888, considered that when the output reached 1,500,000 tons per annum, the cost of raising, conveying, and putting f. o. b. at Lulea would not exceed 5s. 6d. per ton, including royalty and some other charges. But as the output has not yet reached one-third of that quantity, and as all charges have not been included, we may, I think, fairly increase his estimate to say 6s. per ton. Taking the cost of railway freight at only ½d. per ton per mile—3s. 8d. per ton for railway dues, leaving 2s. 4d. per ton for getting, breaking, hand-picking, wheeling, loading, putting f. o. b. at Lulea, interest and superintendence, and 6d. per ton for royalty. A total cost price of 6s. 6d. per ton f. o. b. Lulea is at all events not too high an estimate.

From Bilbao, which is 1,030 miles from Middlesbrough, the present rate of sea-freight for conveyance of ore is about 5s. 3d. per ton. In view of the fact that Lulea is 1,550 miles, or fully 1½ times as far, and that, on account of ice, the traffic has to be done during five months only of the year, I think that an additional 1s. 3d., or a total of 6s. 6d., per ton is not too high an estimate for the average freight from thence. This brings the lowest cost price of Gellivara ore to 6s. 6d. + 6s. 6d. or 13s., per ton delivered in Cleveland, without reckoning any profit to producers.

These conditions were by no means ignored by the original Swedish & Norwegian Railway Company. Their concession, which was first obtained in 1883, authorized them to continue their line through to Victoriavavn, on the Ofoten fiord. That fiord, and indeed the whole of the west coast of Norway, is always free from ice, however severe the winter, due to the fact that it lies in the path of the Gulf Stream, and of the warm winds which are continually moving from the tropics to the polar regions.

On the way to Victoriavavn, and 115 miles from it, or nearly the same distance as Gellivara is from Lulea, the projected railway passes the deposits of Kirunavara and Luossavara. These are similar in character to those at Gellivara. Middlesbrough is only 1,170 miles from that port, whereas it is 1,550 miles from Lulea. Rotterdam is 1,323 miles from Victoriavavn, against 1,550 from Lulea. Antwerp is 1,400 and 1,628 miles respectively. Stettin is considerably nearer to Lulea.

Relatively to Germany and Austria, England, and especially the Cleveland district, will secure the greatest advantage by the opening out of the Victoriavavn route. The average sea freight is, however, scarcely likely to be reduced more than 1s. per ton, or from 6s. 6d. per ton from Lulea to 5s. 6d. per ton from Victoriavavn. There is, therefore, little prospect of Swedish ore of any kind being delivered to Middlesbrough, even via Victoriavavn, at less than 12s. per ton; and this is a higher price than can be expected at present for any kind except grades A and B.

The careful and elaborate surveys of the Gellivara and the three neighboring deposits which were made in 1875 by a commission of experts sent for the purpose by the Swedish Government seem to have established the following facts, viz.:

1. That the ore is all more or less magnetic, the metallic iron contained being in the condition of protoxide, peroxide, or magnetic oxide, or a combination of these oxides.
2. That it is found in lodes or veins, which, together with the bedrocks in which they lie, appear to have had an intrusive origin, and are usually more or less distorted.
3. That the lodes are associated with gneiss, quartz, felspar, granite, hornblende, and mica schist. Corundum, fluorspar, calcspar, actinolite, adamantite, asbestos, epidote, and garnets are also found in or about them.
4. That the phosphorus is in the form of apatite (Ca_3PO_4), and can to a great extent be separated by hand-picking.
5. That ore sufficiently free from phosphorus for acid steel purposes is but a portion, say one-fifth, of the whole.
6. That the deposits generally protrude at the surface of the mountains, where they are easily distinguishable from a considerable distance by their dark color. The ore in sight, or traceable by the dip-needle, constitutes usually about 5% of the total surface area of the deposits.
7. That the more elevated and more outlying portions of the deposits yield, as a rule, ore containing less iron and more impurities than the less elevated and more central portions; and that samples taken from the interior of the lodes give better analyses than those taken from near the surface.

In the summer of 1891 I visited several magnetic iron ore deposits in the neighborhood of Grimstad and Arendal, on the south coast of Norway. The ore seemed to lie in nearly vertical lodes or veins of very variable thickness. In former times several of them had been extensively worked, as testified by the pits, headings, heaps of bedrock and ore, and even remains of winding apparatus still to be seen. Near Soggendal, between Christiansand and Stavanger, is the titaniferous iron ore deposit formerly worked by the Titanic Iron Company, Limited, but now inoperative. It is a mile and a half long and 60 to 70 yards thick. There is a similar deposit near Ekersund, three miles long and 2 to 12 yards thick. To the north of Trondhjem is a vein of magnetite 11 yards thick and of unknown length.

In June, 1893, I again visited the west coast of Norway, passing from Bergen to the Lofoten Islands and back to Stavanger. I explored one mountain situated alongside of a deep-water fiord somewhat farther to the north of Trondhjem, in which magnetite ore was protruding at various points, and which I estimated to contain not less than 25 millions of tons. Not far from this deposit is another of similar character, which I call Trondhjem Y. It is 16 miles long by 44 yards broad. Its depth is unknown. One end of the deposit is within 12 miles of a small seaport situated at the head of the fiord. The bedrocks are ingenious and metamorphic, and generally similar to those of the Swedish deposits.

Still farther to the north are other deposits of magnetic and specular iron, which I call Trondhjem Z. Specimens taken from them yielded 64% of iron, 0.2 to 0.9 of phosphorus, and 0.01 to 0.3 of sulphur.

In one of the Lofoten Islands I examined several detached deposits. The specimens I selected yielded on analysis 61% of iron and only traces of phosphorus; but they contained no less than 9.2% of titanic acid. The deposits do not appear ever to have been worked, although within a quarter of a mile of a good navigable fiord.

THE STRENGTH AND RESILIENCE OF CAST IRON.*

By Prof. J. B. Johnson.

The working qualities of structural castings are of extreme importance, so much so that the necessity for these qualities goes without saying. Furthermore, these qualities can be tested, and are tested, of necessity, in the finishing of the castings for service. Any failure of the working qualities is immediately discovered by the machinist and corrected by the foundryman. The strength and the toughness of the castings, however, are two qualities which are not usually determined at all except by such incidental indications of strength and toughness as come from the breakage of these parts in practice under loads or shocks which they were assumed to be able to resist. This indication is, of course, a very inadequate one, and gives at best no measurable test of the strength or toughness of the iron.

Cast iron is not usually used in structures to carry tensile stress alone, but generally for columns and beams. In machinery castings, however, where all the parts are made of cast iron, some parts are subjected wholly to tensile stress. There are three kinds of strength, therefore, of cast iron, which may be determined by actual tests—namely, tensile strength, compressive strength, and strength in cross bending, as a beam.

The most convenient form for a test specimen of cast iron for cross-bending is a rectangular cross-section about 24 in. long. The size of the cross-section should have some relation to the thickness of the webs or parts in the structural forms into which the metal is run and for the strength of which the tests are made. Thus, if the iron is to be used in forms where the thickness of the metal is about 1 in., the test specimen should be made about 1 in. square. If, however, the metal is to be used in parts the thickness of which is not more than 1/2 in., then it would be well to make the test specimens 1/2 in. in thick and perhaps 1 1/2 to 2 in. wide.

In the case of stove iron the test specimens should not be more than 1/2 in. thick and about 2 in. wide. The length of the specimen is immaterial, and should be such as is adapted to the testing machine or apparatus.

In testing such a bar it should be supported on knife-edges near the ends, these knife-edges being at a definite distance apart. This specimen is then broken by placing a load at the center, preferably by means of another knife-edge, and this load applied slowly and uniformly and without shock. About the only way to do this properly is by means of a screw turned steadily and very slowly. The modulus of rupture of cast iron in cross-breaking corresponds to the tensile strength of the iron, and if the iron were perfectly elastic up to the point of rupture this modulus of rupture would be the same as the tensile strength in pounds per square inch; but since cast iron takes some permanent set before it breaks, the theoretical formula no longer applies, so that the computed modulus of rupture, as determined from cross-breaking tests, is found to be always very much larger than the true tensile strength of the cast iron, its average value being from 1 1/2 to twice as much as the strength per square inch in tension. If the cast iron has a tensile strength of 20,000 lbs. to the square inch, its modulus of rupture in cross-bending will be, therefore, from 30,000 to 40,000 lbs. It is common to assume that a tensile strength of 20,000 lbs. corresponds to a cross-breaking strength, or modulus of rupture, of about 36,000 lbs. per square inch. To find this modulus of rupture from a cross breaking test on a rectangular bar we use the following simple formula:

$$f = \frac{3}{2} \left(\frac{Wl}{bh^2} \right)$$

where f = modulus of rupture in cross-bending in pounds per square inch; W = load at center of beam in pounds; l = length of beam between bearings in inches; b = horizontal breadth of beam in inches; h = vertical height or depth of beam in inches.

It is much better to use this formula and compute f from the cross-breaking weight W, and the dimensions of the bar b, h and l, than to use some thumb rule, as, for instance, that a bar 1 in. square and 12 in. long should carry a load of 2,000 lbs at the center. This would give a modulus in cross-breaking of 36,000 lbs., which indicates a very fair quality of cast iron, so far as strength is concerned; but if the specimen should prove to be a little more than 1 in. square, or a little less, there is nothing in the specification to show by how much the loads should vary to compensate for this change of size. Whereas, if it be specified that the modulus of rupture should be 36,000 lbs., that could be determined from the above formula very easily, whatever the dimensions may have been. In fact, b and h should always be measured to the nearest 1/100 in., and, of course, the castings could not be made of any given size to anything like this degree of accuracy.

In all cross-bending tests of cast iron some means should be provided for accurately measuring the deflection of the bar up to the point of rupture. This can only be properly done by the aid of some kind of attachment to the testing machine itself. These deflections should be measured to the nearest 1/1000 in. The use of the deflection is to enable us to compute the resilience or elastic spring of the iron, as will be explained below.

Resilience signifies the toughness or the ability of the material to resist a shock or blow. Thus, if the total breaking load be multiplied by the total deflection of the beam, and this product divided by two, the result is the resilience of the beam in inch-pounds, provided the load were measured in pounds and the deflection in inches. This product varies directly with the form and volume of the beam, irrespective of its dimensions, so that if the half product be divided by the total number of cubic inches in the beam, the result represents the resilience of the iron for a rectangular beam in inch-pounds per cubic inch of metal. This is an absolute measure of the resilience or toughness of the iron, but it is easier to weigh the specimen than it is to compute its volume in cubic inches. Hence we may find the resilience of a rectangular beam per pound of metal by dividing the total resilience by the number of pounds in the specimen, just as before we found it per cubic inch by dividing by the number of cubic inches in the specimen. The writer prefers this latter method, and therefore he recommends the following:

* Abstract of a paper read by Prof. J. B. Johnson, of St. Louis, Mo., before the Foundrymen's Association.

Rule: Multiply the breaking load in the middle of the beam by its deflection at the time of rupture, and divide the product by twice the weight of the beam in pounds.

The result should be not less than 20 for ordinary cast iron, and may be as high as 50 for the best quality of refined cast iron, such as is commonly known as gun metal.

In all tests of cast iron in tension the specimen should be cast round, free from all defects, and then turned down in a lathe throughout its entire length, the middle portion being reduced to a somewhat smaller diameter than the ends. Such a specimen can only be broken upon a regular tension testing machine, such as few foundries have in their outfit, and hence these tests are not so well adapted to common practice as the cross breaking tests described above.

Several concerns manufacture cross-breaking testing machines which give indications of the deflection, such as are required in the application of the rule given above for determining resilience. In these tests it is very necessary that the load be put on slowly and with perfect uniformity, and this is accomplished in all these machines by means of a screw.

It must be noted that both the strength and the resilience can be determined from the same test. Having measured the length, breadth and height of the bar, and determined the breaking load, we can compute the breaking strength as described above; also having weighed the bar and determined its breaking load and its deflection, the resilience in inch-pounds per pound of metal can be determined so that a single test in cross-breaking fixes both the strength and the resilience or toughness of the iron. It must not be forgotten that these two qualities are entirely distinct, and must not be mistaken the one for the other. Thus, one mixture may be very strong and brittle, and another comparatively weak but very high in resilience. It is not impossible, however, to obtain both great strength and high resilience from the same mixture, and this, of course, is the ideal kind of cast iron. Such iron offers the greatest resistance, both to dead loads and heavy strains, and also to such shocks and blows as it may receive either in actual practice or from some accident.

ALKALI LANDS IN NORTH CHINA.

A correspondent of the North China "Herald" gives the following information concerning the alkali lands in the north part of that country:

Chinese may often be heard to say, in the North especially, that certain ground is useless on account of alkalinity. The following report shows that this land has a value of its own which will probably be appreciated hereafter.

During the dry time of the year the surface of the land in many parts of the North of China is covered with a white incrustation of salts, called *chien* by the natives, which easily dissolves in water and therefore disappears during the rainy season. A sample collected in the neighborhood of Peking, a few li to the S. W. of the city, contained:

Chloride of sodium (common salt).....	23.8%
Carbonate of sodium (soda).....	12.4%
Sulphate of sodium (Glauber's salts).....	63.8%
	100.0%

I obtained large quantities of these salts by having the ground swept with a broom and hixivating the sweepings with warm water. Over a third of the material thus collected proved to be soluble matter. It may be separated from the solid residue either by filtering or by syphoning the supernatant liquor and evaporating the saline solution, which shows a strong alkaline reaction on account of the carbonate of sodium contained in it. When sufficiently concentrated, the liquid, on cooling, deposits a large mass of crystalline matter, which for the most consists of sodium sulphate, a part of it, together with the sodium carbonate and chloride and sodium, remaining in the mother liquor. The latter, on being evaporated by dryness, yields a brownish looking substance—the color being due to organic matter—which, on being treated with vinegar, shows a brisk effervescence. It is to all intents and purposes the same substance as the one called *Tzu-chien* by the Chinese, which is an impure carbonate of soda extensively used in dye works. Not only does it serve for the cleansing of textile fabrics, but, owing to its large amount of sodium sulphate, is also used as a mordant, for instance, in coloring cotton cloth with a solution of indigo, etc.

Judging from the above, there appears to be an abundance of sodium sulphate in some parts of China which may become valuable some time or other when, with the introduction of foreign industries, such as the manufacture of glass and soap, a greater demand is created for this chemical substance than exists at present. As there is plenty of limestone and coal in many places, all the materials wanted are possessed in abundance. This, in addition to the cheapness of labor, makes it not improbable that at some time or other China will become one of the chief producing countries of soda.

In the table below I give an analysis of each of the four kinds of soda distinguished in trade. The samples were obtained from one of the great depots outside the city. For comparison, the English commercial "degrees" have been added. Taking the quotations of a London trade report, I find that on the whole prices in Peking, at present exchange, do not rule much above those at home.

Color.	Water.	Carb. of soda.	Chlor. of sodium.	Sulphate of sodium.	Eng. Price per 100 catties or 1 picul.
	%	%	%	deg.	
K'ou-chien (from Kalgan):					
1.—P'ien chien, yellowish, white....	45.61	53.90	1.33	traces	31.41 49.4 Tiao, S'hai Tls. 3.8
Hsi-k'ou-chien (from Shansi):					
2.—Pai chien, white..	52.60	45.71	1.07	traces	27.09 46.8 Tiao, S'hai Tls. 3.6
3.—Tzu chien, first quality, dirty yellow.	28.65	41.61	6.29	23.46	24.66 39.0 Tiao, S'hai Tls. 3.0
4.—Do, second quality, brown	17.30	33.13	18.14	31.27	19.19 35.1 Tiao, S'hai Tls. 2.7

At present this substance is extensively used by the Chinese for cleaning purposes, taking the place of soap in foreign countries. It also serves as a baking powder in the preparation of Chinese bread. As far as I have been able to ascertain, the article which is sold at Peking is nearly all derived from places outside the Great Wall. There are two different kinds—

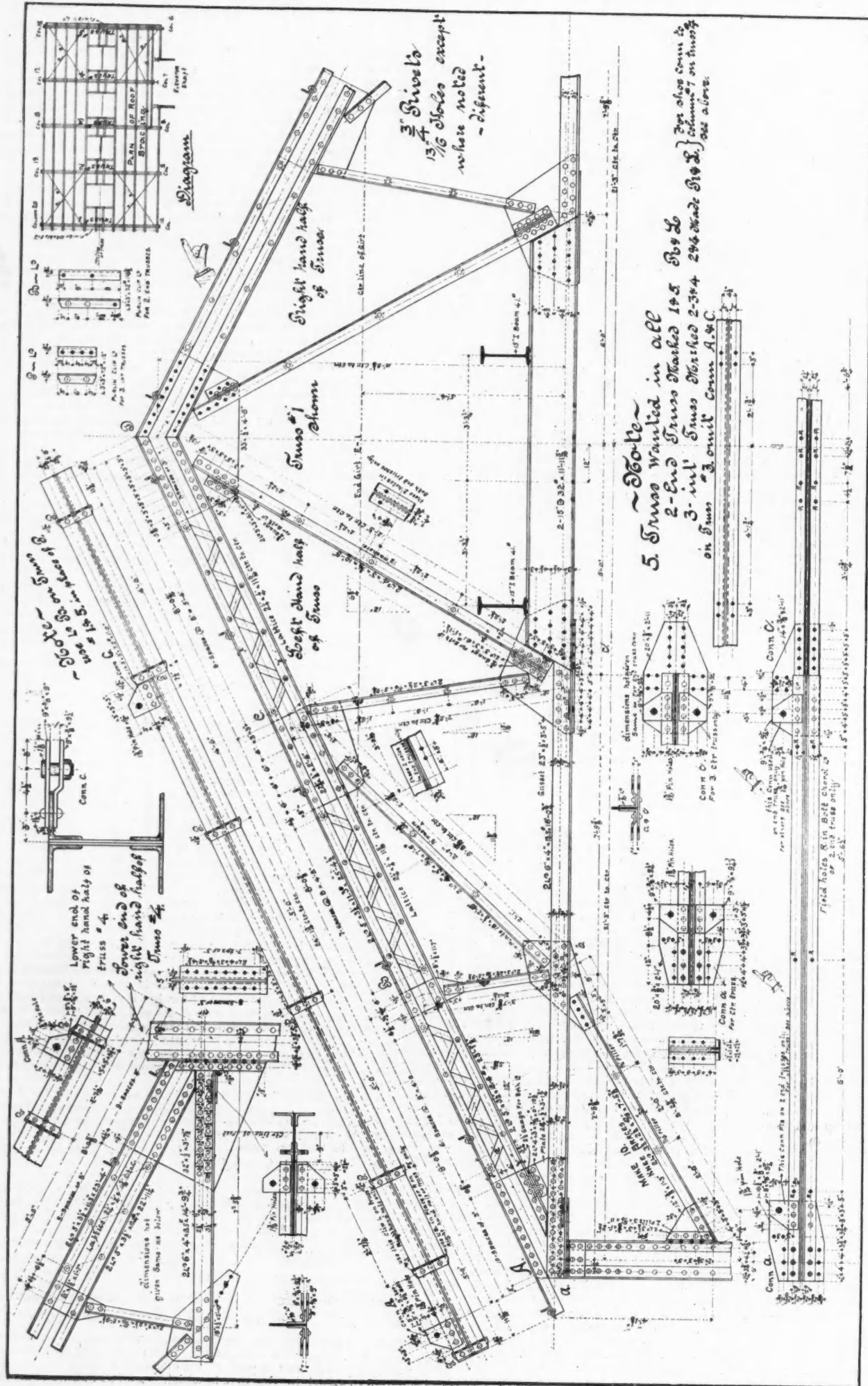


FIG. 3.—DETAILS OF ROOF TRUSSES FOR OHIO STEEL COMPANY BUILDING.

"Kouchien," which is brought here from Kalgan, and "ksik'ouchien," which comes from the northern part of the province of Shansi, the prefecture Tat'ungfu. The former, I am told, is obtained from salt lakes, pools, or pits dug for the purpose of collecting the brine with which the

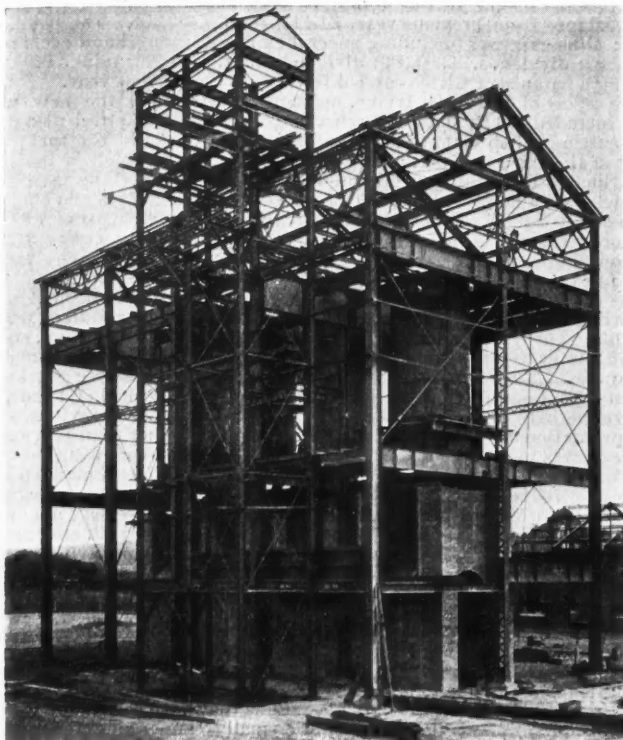


FIG. 1.—CUPOLA HOUSE, OHIO STEEL COMPANY.

scil is impregnated. It is a very superior article, almost free from impurities and largely used in the preparation of *mantou* and other kinds of bread. The material which furnishes the *ksik'ouchien* is found as a

THE OHIO STEEL COMPANY'S BUILDING.

The plant of the Ohio Steel Company at Youngstown, O., which is now nearing completion, promises to be one of the best plants of the kind in the United States. The entire work, including the buildings, machinery and all appliances, was designed by Mr. Julian Kennedy, consulting engineer, of Pittsburg, Pa., who has had a wide experience in this class of work, both in Pittsburg and throughout the entire country.

There are some 20 separate buildings, all of them carefully designed, as regards detail, and of sufficient weight and strength to last a length of time greater than ordinary metal buildings. Those which we illustrate are especially worthy of note.

The cupola house, shown in Fig. 1, is of such size as to accommodate four cupolas, as it is 42 ft. wide by 78 ft. long by 80 ft. high to the top of the elevator frame. The first, or track floor, is of steel plates fastened to I-beam joists, with counter sunk rivets, while the cinder floor, almost on the same level, is of brick arches, set in between steel beams. The tapping floor, directly above this, is composed of steel plates on steel joists, and while the charging floor at the top is of $\frac{3}{4}$ -in. steel plate with counter-sunk rivets to attach it to the joists, the same as the others. All these floor plates are fitted up with tight joints, and have been given a very close fit all round the cupolas and columns. The roof trusses, of which the details are given in Fig. 3, support, in addition to the weight of the covering, the hoods and stacks of the cupolas. The corrugated sheeting, which is No. 18 gage, rests directly upon the steel truss purlins, and is connected to them by clips of $\frac{3}{4}$ -in. by No. 16 straps, three to each sheet, while the other seams are stitched with small rivets about every 12 in. The drawings show the character of the details on the framework, which are uniformly heavy, and calculated to resist the wear and tear to which they will be subjected. As will be noted, the charging floor, which will carry an enormous weight, from the materials used in charging the cupola, is supported by riveted plate girders 5 ft. deep, which are riveted to the outside columns, and are supported at intermediate points by Z-bar columns. All the columns rest upon cast iron bed plates set on brick piers, and are anchored by bolts which are built into the brickwork.

The pit furnace building, of which an illustration is also given, in Fig. 2, is 54 ft. wide by 175 ft. long by 60 ft. high, and the columns are built double for part of their height, the shorter half carrying steel plate girders for the traveling cranes. These cranes, which were built by the Morgan Engineering Company, are of similar type to those exhibited by that firm at the World's Fair. The details of the building are fully shown in the illustration, and are similar in their make-up to those described on the cupola house.

Both of the buildings described were built by the Youngstown Bridge Company, of Youngstown, which also had the contract for the bottom house, extractor building, boiler house, producer house, mill building, saw shed, hot-bed building, the elevator building for the boiler house, and the elevator shaft for the cupola house. The mill building is 80 ft. wide by 420 ft. long, and has columns of heavy double construction for carrying crane girders to support the traveling crane which handles the machinery

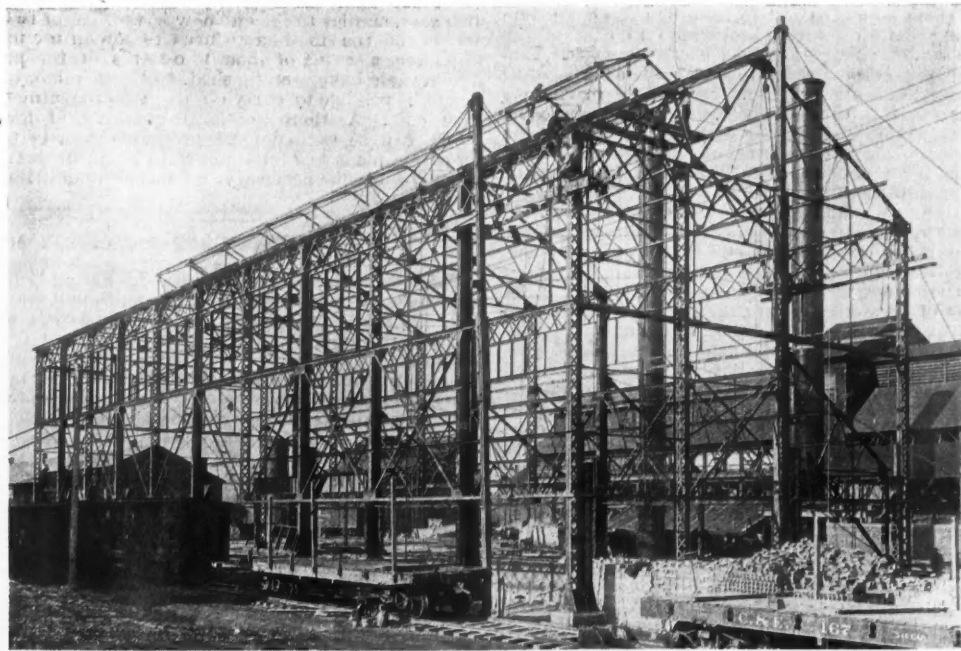


FIG. 2.—PIT FURNACE BUILDING, OHIO STEEL COMPANY.

white efflorescence on the soil, similar to that observed in the neighborhood of Peking. According to the account given by the Chinese, it forms layers of considerable thickness in some places, and is a good deal richer in the carbonate than what is to be got hereabout. There are several sorts of it, one of them called "*pachien*" being of an excellent quality. It is almost free from chlorides, and shows hardly a trace of sulphate, which is all the more remarkable, as it is said to be prepared by a process of crystallization from some of the inferior sorts of *tzuchien* already spoken of.

Reservoirs for High Pressures.—The Societe John Cockerill, at Seraing, Belgium, recently filled an order for reservoirs or holders for carbonic acid, which were guaranteed to stand a pressure of no less than 300 atmospheres.

of the blooming mill and roll trains. It is expected that the plant will be in operation before long, as the machinery is being rapidly placed in position.

Locomotives by Weight.—A contract was recently offered for locomotives for the Egyptian State Railroad, in which the tenders were made by weight, a method which will strike our locomotive builders as something entirely new. The bids received were as follows: Societe Franco-Belge, 1,025 fr. per kilo.; Neilson & Co., Glasgow, Scotland, 1,043.634 fr. per kilo.; Ansaldo & Co., Genoa, Italy, 1,100 fr. per kilo.; Societe John Cockerill, Seraing, Belgium, 1,152 fr. per kilo. The contract was given to the Societe Franco-Belge at its bid. At the rate named the price of a 40-ton locomotive would be a little over \$8,000.

ELECTRIC TRANSMISSION OF POWER FOR MINING PURPOSES.*

One of the most interesting cases of the electrical transmission of power for coal mining purposes in Europe has been completed and set in operation at the Decize Collieries in the Nièvre Department of France, and which are owned by MM. Schneider & Co. This installation is remarkable from the fact that diphas alternating currents are employed for the transmission, and diphas alternating current motors are used for reconverting the electrical energy into mechanical power at the different pits. In designing this plant the problem to be solved was to erect a central generating station for the distribution of electrical energy at the different pits where it could be utilised in electromotors for operating ventilating fans, hauling machinery, pumps and for lighting purposes. A general idea of what had to be accomplished is shown in the annexed table:

Site.	Distance from generating station. Yards.	Electrical machinery or lamps receiving the current transmitted.
1.—West.		
Puits des Chagnats.....	5,090	30-H. P. Electric motor.*
Puits des Lacots.....	3,466	" " " "
Puits des Coupes.....	2,058	" " " "
Puits des Zagots.....	1,084	Electric hauling machine of 15 H. P.†
2.—Generating Station.		
Various installations.....	—	Six arc and 100 incandescent lamps; ‡
3.—East.		
Puits des Marizy.....	1,300	30-H. P. electric motor and 24 arc lamps.§
Sorting and washing shops of the		
Pré-Charpin.....	2,490	500 incandescent lamps of 16-C. P.‡
Champvert.....	3,250	12 H. P. electric motor.¶

* Used for ventilating fan. † Inclined plane. ‡ Lighting. § Ventilating fan and lighting. ¶ Pumping.

The generating station is situated respectively at distances of from 3.1 miles and 1.86 miles from the extreme points which have to be supplied with current. It contains a battery of six boilers and two units (steam engines and dynamos), each of a capacity of 100 kilowatts; a further unit will shortly be laid down. The two units may be worked singly or in parallel. The engines are of the horizontal non-condensing type, running at 200 revolutions per minute, and driving the diphas alternators by means of belting. A notable feature in this connection is the fact that each electrical unit comprises a twin alternator, or in reality two machines, placed one at each end of the shaft, the driving pulley carrying the engine belt being arranged in the middle of the shaft. Of course, in a case like the present, where current is employed both for lighting and for power purposes, one of the circuits may become more loaded than another, and in this event the equilibrium must be established by varying the ratio of the electromotive forces. The arrangement adopted in the Decize installation allows of this being accomplished, as each of the two circuits having a distinct field, it is only necessary to vary the exciting current by means of rheostats to get the desired effect. The generators introduced are Zipernowsky 10-pole alternators, with revolving field magnets. The 10-field magnets are connected together in series, and the exciting current is led to them by means of two metallic rings carried on an extension of the driving shaft on the opposite side to that of the driving pulley—that is to say, on an outer extension of the shaft. Two ordinary brass brushes press upon these rings, to which the exciting current is furnished by a direct current dynamo. This latter machine is operated by a belt from the shaft of the alternator. At 900 revolutions a minute this direct current dynamo supplies the exciting current for the twin alternator, being between 25 and 30 amperes at 110 volts. The fixed armature of the alternators is formed of 10 coils, any one of which can be withdrawn and replaced with little trouble.

After passing through the switchboard, the current is transmitted mainly by means of overhead wires to the points of utilization, the only portion laid underground being towards the end of the principal line leading to the Chagnats Pit. The wires forming the overhead line are of silicon-bronze, and are carried on porcelain insulators attached to poles 24 ft. high. The diameter of the wires constituting the principal line to the western part of the district is 6 mm., and 4 mm. in the case of the remainder of the line. It is noteworthy that the same poles carrying the transmission wires also support telephone wires, the latter being arranged 12 ft. from the ground. In order to counteract the effects of induction in the telephone wires, the line conductors are crossed at distances averaging 540 yards, and by this means the difficulty of understanding conversation along the telephone wires which use the earth as return, has been overcome. The small portion of underground line forms a lead-covered cable, laid in a wooden conduit, as also does the telephone line for the same distance. Suitable lightning conductors are provided at the generating and distributing sub-stations and at intervals along the line. The electromotors at the sub-stations, where the current is utilized for the different purposes mentioned in the table given above, are of the same type as the generators. These diphas motors are easily set in operation, and are to all intents and purposes left to themselves for several hours together. The only attention they receive is the visit of an employee every six or eight hours to ascertain whether the motors are working properly. The sub stations are situated in the forest, and the facility of working on this system as compared with the erection in each place of a boiler, steam engine and ventilating fan, is considered to be remarkable, apart from the question of the cost of transporting fuel.

Coal Mining in Bengal.—There are about sixty collieries in Bengal, and the works extend over an area of about 500 square miles. The miners are all drawn from the aboriginal tribes, chiefly Sonthals and Bauris, who are noted for their endurance and docility. In the larger and better mines coal is raised by steam power from pits or shafts and inclines, and in the smaller mines by hand labor. Twenty-five of these collieries turned out during the last year 1,041,706 tons of coal and manufactured 14,631 tons of coke, utilizing 92 engines of 1,907 H. P. Ventilation is ordinarily natural by a proper system of air openings, but in some cases is assisted by furnaces and fans. The lighting is by ordinary open oil lamps. The total number of work-people employed was upward of 20,000.

* "Colliery Guardian."

ABSTRACTS OF OFFICIAL REPORTS.

Mount Morgan Gold Mining Company, Queensland.

The report of this company for the year ending May 31st, 1894, shows total receipts for the year as follows: Gold account, £489,001; sundries, £28; balance from previous year, £4,424; total, £493,453. The payments were: Mine expenses (including general expenses, interest and exchange), £177,288; dividends, £300,000; dividend duty, £15,000; total, £492,288, leaving a balance of £1,165 carried forward to the current year.

The report of Mr. G. H. Irvine, manager, shows that the new work done included 968 ft. shaft and winze sinking, and 2,869 ft. drifting and crosscutting. Especial attention has been given to plans for the treatment of the low-grade ore, a very large quantity of which is in sight, but which will require entirely different processes from those used with the richer ores heretofore worked. As there were 102,227 oz. gold obtained from 65,076 tons of ore during the year, the average yield was 1.57 oz. per ton. The total expenses were £177,288, the average cost was \$13.075 per ton of ore worked, or \$8.323 per ounce of gold obtained. The largest item in expenses was for wages, which were 54.1% of the total.

The report of Mr. G. A. Richard, superintendent of ore treatment, says: "During the year 65,076 tons of ore have been treated, yielding 102,227 oz. gold. The greater portion of this consisted of ordinary ore, sinter-kaolin, sinter ironstone, etc., from the upper workings of the mine; the remainder, 2,325 tons, being mundic ore from the Grasstree workings. About 2,300 tons of the above amount consisted of crushed and calcined ore which had been allowed to accumulate during the previous year. The proportion of gold extracted has been slightly higher than previously, and amounts to within a small fraction of 95% of the assay value.

"Considerable alterations have been made to the different plants for the purpose of reducing the cost of treatment and to increase their capacities. At the Upper Works two sets of Krom rolls with necessary appurtenances were added to the crushing plant and started in April, effecting an increase in its capacity of about 900 tons per month. A revolving furnace was erected at the Upper Works and started working in the beginning of April, since which time it has been working constantly with very satisfactory results. The chlorination plant has been completely altered, 12 25-ton vats being put in place of the barrels, small vats, etc., previously in use; a chlorine still, and set of chlorine towers, and tanks for reserve of chlorine solution, being erected in order to enable the use of cheaper materials for producing chlorine.

"At the Lower Works the only alterations that have been made were in the chlorination plant; these consist of a small steam engine for working the vacuum pumps in place of a larger engine and boiler before in use. A chlorine still, towers and a chlorine solution tank have been put in for the purpose of using manganese, salt and sulphuric acid, for producing chlorine in place of the chloride of lime previously used. An amalgamating plant, consisting of six arrastra pans and an equal number of Berdan pans, has been erected for the purpose of treating the poorer filter ash, etc. One of the assay offices has been closed, and all the assays are now made in the other by one assayer and an assistant.

"Plans and specifications have been prepared for three revolving furnaces, similar to the one now in use, but of twice the capacity. These will enable the small hand-furnaces now in use to be dispensed with, and will effect a saving of about two-thirds of the present cost of calcining. When these have been finished, and some minor changes have been made, it will be possible to carry on the whole treatment at about half the previous cost. As there are large quantities of low-grade ore in the mine, which can be treated more profitably than by the present means, I am preparing plans and estimates for a plant for this purpose. An additional plant will also be necessary, as larger quantities will have to be dealt with."

ANTIMONY AND BISMUTH IN BOLIVIA.

The Consul-General of France at La Paz in Bolivia has recently made a special report on the mines of bismuth and antimony in that country. The only deposit of bismuth ore actually known is that of Quechisla (also known as Chorolque), though some exploration for others has been made, but without success. The returns show that the production of this mine is about 500 Spanish quintals, or 23,000 kilos., per month. This production, however, is regulated in concert with the European producers. In addition to bismuth the Quechisla mine yields some tin and a little silver.

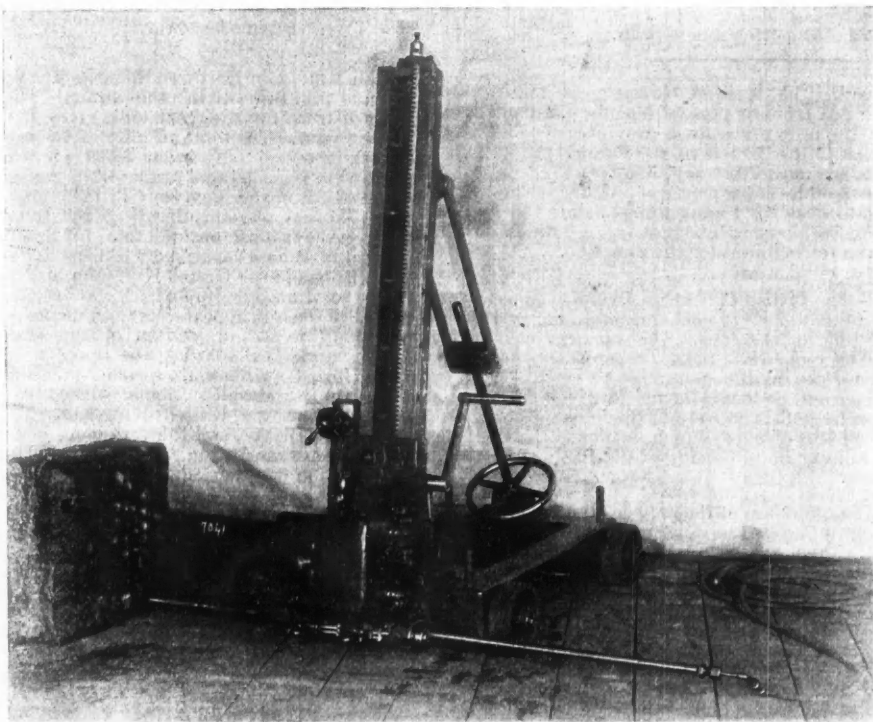
Antimony is found in many places in the department of Potosi, generally in connection with gold and silver ores. In the province of Chayantla there are many veins of the sulphuret of antimony, which have become more accessible than formerly since the building of the Antofagasta Railroad. Owing to the present low price of the metal, however, it does not pay to work the poorer deposits. The Amayapampa Company, a recently formed Bolivian corporation, is now producing and exporting 100 metric tons a month of 65% ore. The mine is 18 miles from the railroad, over a difficult mountain trail. With better transportation the output could be largely increased. It is said, however, that all the veins so far found diminish in richness with depth. The industry is just beginning in Bolivia, and the government has freed the producers from all direct tax and also from export duty.

The Age of Niagara.—The age of the Niagara Falls has been variously estimated at from 6,000 to 55,000 years, according to the data employed by the computers. In a paper read before the Royal Society recently Professor Spencer, after considering the whole geological and other antecedents of the lake country, arrives at the conclusion that the years of the Falls are 31,000, to which must be added another thousand years, as the age of the river before the nativity of its great cataract. The recession of the Falls he calculates at 3.75 ft. per annum. But any inferences from this must be complicated by the fact that the lake region is slowly rising at the rate of from 1.25 ft. to 2.5 ft. in a century. Accordingly, if the present rate of uplift continues, the falls will be brought to an end before they have reached Lake Erie by the diversion of the waters of the Upper Lakes by way of Chicago to the Mississippi. However, as this event cannot take place for 7,000 or 8,000 years, there is no necessity for making immediate preparations against this evil day.

ELECTRIC GADDER DIAMOND DRILL.

An ingenious adaptation of quarrying by electricity is the electric gadder diamond drill, recently put out by the General Electric Company. The table on which the actuating mechanism rests can be inclined at any angle with the floor and allowed a travel of 7 ft. parallel to its face. In addition, the drill can be so lowered as to drill within two inches of the rock bed, and by a change in the driving and feed-nut gears the automatic feed may be adjusted to the nature of the rock. The motor is provided with a reversing switch, which, with a proper arrangement of gears, makes it possible to cut into a corner in either direction by reversing the feed screw in the feed device; that is, the gadder can cut either to its right or left side. The machine is of 2 K. W. capacity and is provided with a quick return mechanism. While cutting into the rock the drill is fed slowly; in marble the speed is about 1 ft. per minute, and when it has reached the desired depth it can be given a quick back feed by the simple movement of a lever.

The motor is of the iron-clad, waterproof and dust-tight type. The end thrust of the feed screw in both directions is taken up by the ball thrust bearings. The drill rod can be made of any reasonable length up to 12 ft.



ELECTRIC GADDER DIAMOND DRILL.

An advantage which this machine possesses is that there can be no discoloration of the marble by flying oil.

The electrical gadder diamond drill can be operated on any power circuit, and its simplicity brings it into the class of devices which may be operated by ordinary labor.

Railroad Building in Japan.—Except two lines in progress, one to extend from Tsuruga by Kanagawa, into Etchin, and the other from Fukushima on the main northern line, by Yonezawa and Akita, to Awomori, there are no government railways being made in that part of Japan east of the Biwa Lake, but a fresh impulse has been given to the construction of private lines. The company owning the main line from Tokio to Awomori contemplates the construction of a line from Tokio through Mito to Sendai, and is considering the connection of Shimbashi Station, Tokio, with their terminus at Ueno by a direct line across the city. A metropolitan line is being constructed to the center of Tokio, near Ueno. The connection of Nagoya with the Kensei Railway at Yokkaichi by a direct line across the Kisagawa, by the head of the Owari Gulf, which will afford an alternative and shorter route to Kioto, is being proceeded with.

A Disinfectant from Coke Oven By-Products.—The new disinfectant "Izal" was discovered by J. H. Worrall, chemist to the Thorncliffe collieries, near Sheffield, Eng. While investigating the nature of the by-products derived from the Thorncliffe patent coke ovens, he discovered that one of the products was a previously-unknown oil intermediate in its general properties between the benzene series and its derivatives on the one hand, and the paraffin series on the other. From this oil he extracted a body which was found to possess much greater antiseptic power than pure crystallized carbolic acid. Its mean boiling-point is considerably higher than that of pure carbolic acid, and the body itself is of greater density than water, in which it is insoluble. This insolubility in water is one of its special advantages, inasmuch as it prevents the disinfecting principal being washed away from the part which requires to be disinfected, as usually happens with other antiseptic agents. Though insoluble in water; the particles of the new body when finely divided remain permanently suspended, forming a beautiful milk-white emulsion. In this way the two most important desiderata of a disinfectant—viz., insolubility in water, and easy distribution by water—are attained.

Coal Mining in China.—A recent dispatch from Tientsin states that the Kaiping colliery, recently mentioned in these columns, is now working extra time and producing over 1,000 tons per day.

Analysis of Bermuda Asphalt.—The following is a complete analysis of asphalt from Bermuda: Specific gravity at 60° Fahr., 1.071; bitumen soluble in carbon disulphide, 97.22%; mineral matter or ash, 1.5%; non-bituminous organic matter, 1.28%; portion of total bitumen soluble in alcohol, 11.66%; portion of total bitumen soluble in ether, 81.63%; loss at 212° Fahr., 1.37%; loss at 400° in 10 hours, 17.8%; loss at 400° calculated to amount of bitumen present, 18.308%; softening point, 113°; flowing point, 150°. Physical tests give the following results with two separate sets of samples: Average tensile strength, 399 lb. and 508 lb. at 32°, 116 lb. and 204 lb. at 64°, and 20 lb. and 44 lb. at 108°. The ultimate compressive strength per square inch at 32° was 1,750 lb., and at 65° 667 lb.

Minerals, Railways and Roads of Honduras.—The British Minister of Guatemala in a recent report on the economic condition of Honduras, says it is essentially a mining country, and in the opinion of American experts and prospectors the mineral wealth hidden beneath its serrated

soil is enormous; yet on this so vital point, hardly any statistics are published. The country, considering its area, may be almost described as depopulated, and is seriously affected by the scarcity of labor, toward which the apathy and inherent aversion of the native is so great that unless recourse is had to foreign immigration on a large scale, the republic is likely to remain, for years to come, in its present backward and undeveloped condition. Antimony, copper, gold, iron, lead and silver are found in almost every department, and brown coal is said to be plentiful on the north coast. Recently, coal of a superior quality has been discovered near Sanpedro Sula. The coal, of a semi-anthracite character, is in a vein 5 ft. thick, cropping to surface in close proximity to the Atlantic port of La Ceiba. This discovery will be of the greatest importance to the republic, as the establishment of a coaling station in one of the central American Atlantic ports is one of the most urgent wants of steamers plying in that region. According to the mining code of Honduras, coal deposits are the exclusive property of the state, and cannot be denounced like other mineral-bearing deposits, but it is hoped that the government will assist in securing some of the coal lands, and opening up the hidden treasure. The hitherto non-success of many mining enterprises must be attributed chiefly to gross incompetence and often to dishonesty on the part of their managers. In addition, former administrations, in their anxiety to foster and extend the mining industry, made the mistake of conceding extensive tracts of land to applicants not in a position to turn their concessions to account, and often actuated by dishonest motives. The consequence was that so-called companies and syndicates acquired vast tracts of land, to the detriment of legitimate enterprise and honest prospectors. An idea of the worthlessness of these companies may be formed from the fact that while in the years 1887-9 no less than 800 mines were discovered, up till to-day hardly two or three of these claims have made a pretence of honest development. The want of good international communication is a serious drawback, which can only be removed by earnest and immediate endeavors of the government to open up the remote districts of the country. No extension of the railway system has been made in the past year. The only line running is that from Puerto Carter, one of the Atlantic ports, to San Pedro Sula, a distance of about 87 miles. A contract has been signed by Messrs. Valentine and Van Auken, American contractors, to extend this line to Amapala, on the Pacific coast, and thus connect the two oceans. If this contract be carried out the Republic will benefit to a very great extent, as vast tracts of rich land and virgin forests will be opened out.

CORNISH TIN MINING IN PHOTOGRAPH.

WITH SUPPLEMENT.

Through a typographical error in our issue of August 18th, the figures named in the description on page 154 did not correspond with those in the supplement. The first two, Figs. 4 and 5, are correct, but the Fig. 4 following the latter should have been Fig. 6, and the last, Fig. 20, should have been Fig. 7.

This week we present two more illustrations of the same subject, showing the method of timbering when the roof is weak.

Fig. 8 shows the workings in the 406-fathom level in Cook's Kitchen mine. In this level the hanging wall has given much trouble from falls and some serious accidents have occurred. The vein lies at an angle of about 45°. The photograph is so excellently taken that the treacherous character of the hanging wall can readily be seen, and also, by comparison with the miners, the relative size of the timber used.

Fig. 9 shows the stope above the 66-fathom level in the Blue Hills mine, where the lode is only from 4 to 5 ft. wide and lies very flat. The roof, while somewhat similar to that in the 406-fathom level of Cook's Kitchen, is stronger and needs less timbering to support it. In the middle background is shown a "pare" of men setting a new prop.

The Trans-Caspian Railroad.—The Russian Government has decided to extend the Trans-Caspian line from its present terminus at Samarcand to Merghilan, the capital of the newly acquired province of Ferghana. This will carry the line almost to the borders of the Pamir, the disputed region whose possession, English authorities say, involves the control of Afghanistan, Tibet and the mountain provinces of western China. It will put Russia in a position to siege the Pamir almost before the English could hear of it. The line to Tashkent will be built as a branch of the line. Orders have been given for material for the new line.

Coal Imports at Brindisi.—The British Consul at Brindisi reports that a small decrease occurred in the imports of coal and pitch during 1893 as compared with 1892, amounting to 5,956 tons. The importations during those years were: 1893, 124,491 tons, 1892, 130,447 tons. Last year's total included 3,544 tons of pitch for use in the manufacture of patent fuel. The Italian Government imported no coal during 1893 for the use of government vessels. The falling-off is entirely in the coal imported by the railway company, the importance of which is dependent on the traffic requirements of the railway lines meeting at the Brindisi Station.

Tungsten for Bullets.—The reduction of the caliber of guns is necessarily accompanied with a diminution in the weight of the projectile. The length of the latter, in fact, cannot exceed a certain limit, beyond which it would no longer have sufficient stability in its trajectory. It would therefore be of considerable interest to have at our disposal, for the manufacture of rifle balls, a metal of reasonable price and heavier than lead. One of the metals upon which hopes may be founded, remarks the "Revue d'Armes Portatives et de Tir," is tungsten. This metal, which is almost as hard as steel, has a density varying from 17 to 19.3, say 1½ times that of lead. By reason of such qualities, balls of tungsten, of equal dimensions, possess a power of penetration much greater than that of lead. Thus, a tungsten ball penetrates a steel plate 3 in. in thickness at a distance of 650 yds., while a similar one of lead penetrates a 2½ in. plate at 325 yards only. The present obstacle to the use of tungsten is its relatively high price, but there are indications that this will soon be lowered to reasonable figures.

The Sulphur Industry of Japan.—The sulphur industry of Japan is undergoing considerable expansion. Sulphur is found as a glossy product of sublimation, often covering the crater walls, crevices and clefts of active and extinct volcanoes throughout the country. By far the greatest amount of Japanese sulphur is formed by decomposition of the sulphurated hydrogen of the very numerous "solfataras." The export trade in this article has grown rapidly since the opening of the country to foreign commerce. In 1868, the earliest date for which reliable customs statistics are available, 131 tons were exported. The greater portion went to China. Last year there were 84 mines in operation, of which only 13 produced annually more than 100 tons each. Ninety-five other mines were located and under trial excavation by government permit. The production, as stated in "The Mineral Industry," has increased from 703 metric tons in 1881 to 21,403 metric tons in 1892, while the exports have increased from 1,163 metric tons in 1882 to 19,149 metric tons in 1891.

German Iron Ore Imports.—An interesting statement compiled by Mr. F. W. Luermann for "Stahl und Eisen," as to the imports of iron ore into Germany, shows that iron ores were received by that country in 1893 from no fewer than 20 different outside sources, which included several districts in Spain, north and south, Gellivara in Swedish Lapland, Algiers, Elba, Turkey, Russia, and other countries or places. The following shows the different centers of the iron ore industry whence the chief supplies were obtained, according to information supplied to Mr. Luermann by a leading firm of importers in Rotterdam: Bilbao, 540,476; Lulea (Gellivara), 167,061; Oxelosund (Grangesberg), 142,130; Caen (North of France), 48,708; Benisaf (Algiers), 55,151; Seriphos (Greek Archipelago), 17,363; Bona (Algiers), 20,810; Poti (Caucasus), 40,115; Rio Marino (North-west Africa), 18,552; Ergasteria (Greece), 13,195; Elba (Italy), 12,194; Portman (South of Spain), 6,268; Santander (North of Spain), 6,897; Gerrucha (Spain), 7,314; other districts, 10,026; total, 1,139,559 tons. The most interesting feature is the large import from Lulea and from Grangesberg, which are comparatively new sources of supply.

Shipbuilding in the United States.—During the fiscal year ending June 30th there were built and documented in the United States 894 vessels with a tonnage of 134,390. This does not include unrigged vessels, but

it includes many river and harbor craft. The Bureau of Navigation does not classify vessels as destined for the foreign or the coastwise traffic, though it classifies them geographically. A large proportion of the shipbuilding, especially of the larger steamers, is on the lakes. Almost all the rest is for local or coastwise traffic. Of this total there were 45 steamers of iron or steel with an average tonnage of something more than 1,000, and 308 wooden steamers, many of which must have been tugs, for their aggregate tonnage was 42,458. There were also 541 sailing vessels with a tonnage of 42,458. The total tonnage for the year was about two-thirds that of last year, and very considerably less than in any previous year since 1886. In April last there were in process of construction in England 346 steamers of a tonnage of 663,396, and 68 sailing vessels of a tonnage of 61,812. The total was 414 vessels and 725,208 tons, of which 116 steam and sailing vessels with a tonnage of about 150,000 were on foreign orders. For four years past the number of vessels has been:

	Steam.		Sail.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.
1890-91.....	488	185,037	896	181,765	1,384	366,802
1891-92.....	438	92,531	957	107,101	1,395	199,632
1892-93.....	380	131,368	576	77,271	956	211,639
1893-94.....	541	42,458	353	91,932	894	134,390

It will be seen that there was a considerable decrease in the average size of vessels built last year.

Iron Mining in Northern Spain.—Mr. Victor de Larrea, Acting British Consul at Bilbao, in the annual commercial report of that consular district for the year 1893, gives particulars of the mining of iron ore in Spain. The total number of the mines registered in Spain is over 15,000, of which only about 2,000 are worked. The province of Biscay gains very considerable profits from its rich iron ore mines, as may be deduced from the fact that in 1893, of a total production in Spain of 5,497,540 tons, the consular district of Bilbao was responsible for 4,986,650 tons; while in 1892, out of a total for Spain of 5,405,170 tons, the consular district of Bilbao furnished 4,573,560 tons. The exportation of iron ore from Bilbao to the United Kingdom in 1893 was over 3,000,000 tons, and, as the total foreign import of iron ores into the United Kingdom was 4,065,863 tons, it appears that shipments of Bilbao ores made up 75% of the total foreign importation of iron ores into the United Kingdom in 1893; and, calculating the yearly production of iron ores in the United Kingdom to be 14,000,000 tons, it would appear that Bilbao supplies about the fifth part of the iron ores yearly consumed in the United Kingdom. With regard to the output of iron ore in Biscay, and the very considerable quantities exported for the last sixteen years at the rate of 3,000,000 tons to 4,000,000 tons per annum, the question has been raised as to how long the mines may be expected to continue this yield. This is a matter very difficult to forecast, but it may be observed that the number of mines yielding good quality ores is becoming smaller, with the inevitable result that in the course of time the exportation will decrease and the quality deteriorate. The deposits are bedlike in form, and appear with an exposed surface, or simply covered by shale, or overlaid by heavy beds of limestone. They are all quarried. The number of men employed in the working of the iron ore mines in the province of Biscay is estimated at 12,000. In "The Mineral Industry" the production by provinces is given, and also cost of operations.

PATENTS RELATING TO MINING AND METALLURGY.

United States.

The following is a list of the patents relating to mining metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

TUESDAY, AUGUST 14TH, 1894.

- 524,311. Drop Hammer. William A. Cornbrooks, Moline, Ill. Assignor to the Williams, White & Company, same place. Combination with main frame, rollers and board of shifting rod and rockshaft.
- 524,313. Tunnel. Alexander S. Dandridge, Leetown, W. Va. Metallic core or shell with chamber for filling.
- 524,317. Smoke-Consuming Furnace. Henry Engel, West-Cleveland. Assignor of one half to August G. Hig, Cleveland, O. Combination of flue chamber, bridge-wall and combustion chamber.
- 524,328. Furnace. Franklin W. Ingram and Elmer E. Carr, Chicago, Ill. Combination of firebox and perforated brick arch for directing the draft.
- 524,361. Method of and Apparatus for Detecting and Measuring Inflammable Gases. Benjamin C. Tighman, Jr., Philadelphia, Pa. Combination of a source of electrical supply, a conductor of relatively high resistance adapted to change its resistance under the influence of inflammable gas or vapor.
- 524,390. Kiln for Firing Pottery, etc. Lewis Lawton, Trenton, N. J. One or more furnaces in combination with flues leading to the bottom of the firing chamber, the latter having a perforated crown.
- 524,392. Furnace. Dougal J. McKenzie and William Martin, Chicago, Ill. Combination with firebox and combustion chamber of special air passages leading into the latter.
- 524,443. Brick Kiln. Carl F. Kaul, Madison, Neb. Kiln of horse-shoe shape, having main underground flues with branch flues connecting with the interior.
- 524,502. Hoisting and Conveying Apparatus. Thomas F. Moore, Buffalo, N. Y. Combination with tracks running lengthwise of the trench to be excavated, of a conveyor car, hauling bucket and traveling carriage for dumping the load.
- 524,544. Apparatus for Making Gas. Edwin R. Ellsworth, Brooklyn, N. Y. Combination of generator, superheater provided with an atomizer for hydrocarbon, and passages connecting with the holder.
- 524,551. Preparing Charges for and Changing Metallurgical Furnaces. William B. Hughes, Philadelphia, Pa. The method consists in forming the charges into blocks and then feeding such blocks in succession.
- 524,577. Revolving Coal Screen. George W. Cross, Pittston, Pa. Combination of frame, outer screen and internal conical section.
- 524,579. Fuel Feeding Device. Joseph Davies, Bridgeport, Pa. Combination of conveyor and distributor pipe projecting into the furnace.
- 524,586. Ore Concentrating and Gold Saving Apparatus. Calvin M. Fitch, Chicago, Ill. Combination of reciprocating tank having an elevated feed and discharge with a series of transverse amalgamated plates presenting oblique surfaces to a passage of the slimes.
- 524,592; 524,593. Ore Concentrator. George H. Hooper, Hague, N. Y. Jigging screen with side bars, front bar with outlet, waste overflow or chute and screen.
- 524,602. Process of Extracting Gold and Silver from Ores. John C. Montgomerie, Dalmore, Stair, Scotland. Improvement in the cyanide process by introducing an alkaline dioxide in the presence of oxygen under pressure.
- 524,600. Method of Treating Gold or Silver Ores. Edward D. Kendall, Brooklyn, N. Y. The method consists in mixing sodium dioxide with a cyanide solution.

PERSONALS.

Mr. John E. Rothwell is at Cripple Creek, Colo. on professional business.

Mr. James McKennelly, a well known miner of Salt Lake, Utah, is now examining some mines in Baker County, Oregon.

Mr. Edgar G. Tuttle, mining engineer, lately the Superintendent of the Alamo and Coahuila coal companies, at San Felipe, Coahuila, Mex., has opened an office at Newark, N. J., as consulting mining and railroad engineer.

OBITUARY.

Isaac Overton, an old pioneer of the Comstock lode, died at Virginia City, Nev., on August 14th, aged 73 years. During his early life he traveled about in the South, locating for a time in Georgia, where was engaged in the railroad business. He went to the Pacific States in 1849 and divided his time between the Comstock and San Francisco. He was one of the founders of the electric light company at Virginia City, and for many years its secretary. For seven years prior to his death he was associated with his brother in the water company.

SOCIETIES AND TECHNICAL SCHOOLS.

University of Wyoming.—Professors Slosson and Colburn have been engaged in making a large number of analyses of specimens of Wyoming coal and petroleum.

American Association for the Advancement of Science.—We gave last week the report of the opening of the meeting in Brooklyn. On Monday of this week Prof. Joseph Le Conte, of the University of California, presented an invitation for the Association to meet in San Francisco, Cal., next year. He said that the influence of the association was greatly needed in California. One or two hundred members could be added, and the association would be benefited in other ways. The matter was referred to the council. An amendment to the constitution was proposed to admit libraries and scientific societies to membership in the association, so that they can secure the reports of the meetings. The Pratt Library, of Brooklyn, had applied for this privilege, and other institutions desired it. It was proposed to have the institutions represented in the association by president, curator or librarian. James A. Skilton proposed that a section in sociology be added to those in the association. These amendments went over for a year under the rules. Each of the nine sections met.

A number of papers of special interest were read before the Section in Geology and Geography. Among the authors were Arthur Winslow, N. H. Winchell, Warren Upham, Oscar H. Hershey, J. W. Spencer, W. G. Levison, D. S. Martin, C. H. Jenner, F. H. Newell, Joseph H. Hunt, S. H. Williams and Erasmus Haworth.

Before the Section on Physics, presided over by William A. Rogers, papers were presented upon: "A Caloric Effect of the Velocity of Migration of Hydrogen Ions," by Samuel Sheldon; "On the Radiation of Obscure Heat by a Metallic Bar," by Benjamin W. Snow; "The Infra-Red Spectra of Metals," by E. P. Lewis and E. S. Ferry; "On Magnetic Potential," by Frederick Bedell; "On Electric Strength," by Geo. W. Pierce; "A Phonographic Method for Recording the Alternating Current Curve," by C. J. Rolleson; "On the Solution-Tension of Metals," by Harry C. Jones; "A New Recording Thermometer for Closed Spaces," by W. H. Bristol; "On Some Magnetic Characteristics of Iridium," by S. H. Brackett; "Lighting as a Cause of the Dissipation of Energy," by N. D. C. Hodges; "Some Peculiar Lightning Flashes," by Alexander McAdie.

The Section on Anthropology listened to a number of papers, and passed resolutions thanking Prof. F. W. Putnam for the work he did in the way of anthropology advancement at the Chicago exhibition.

The papers before the Section on Economic Science and Statistics were upon: "A Study in Social Economy," by Laura Osborne Talbot; "A New Plan for Proportional Representation in Legislative Bodies," by William H. Goodyear; "Rate of Interest in the United States Considered Geographically," by Henry Farquhar; "The British Land Difficulty—Poultry and Eggs," by James V. R. Swann; "Weeds as Related to Civilization," by Byron D. Halsted; "The Providential Function of Government," by B. E. Fernow; "A Misleading Statement of Gresham's Law," by E. T. Peters. Papers were also read before the other sections. In the afternoon there was a steamboat excursion down the bay.

On Tuesday the first business that occupied the members was a general meeting in the Polytechnic Institute in Brooklyn, when the officers of the association for the ensuing year were elected and other business matters were disposed of. President Brinton, who presided, announced that the Royal Society of England proposes publishing a general index of science and scientists, which is a work greatly needed. He also read a report from the council stating that 213 new members had been elected during the present session, and that 48 distinguished scientists have been honored with fellowships. Notice was also given that the Section of Geography and Geology will be divided into two sep-

arate sections. An excursion has been arranged to take those members of the association interested in forestry on a visit to the White Mountains. After San Francisco had been selected as the place for holding the next annual convention, provided satisfactory rates of fare could be obtained, the Committee on Nomination made its report, which was unanimously adopted.

The officers elected were as follows: President, E. W. Morley, Cleveland; vice-presidents—mathematics and astronomy, E. S. Holden, Lick Observatory, Mount Hamilton, Cal.; physics, W. Le C. Stevens, Troy, N. Y.; chemistry, William McMurtrie, Brooklyn, N. Y.; mechanical science and engineering, William Kent, Passaic, N. J.; geology and geography, Jed. Hotchkiss, Staunton, Va.; zoology, D. S. Jordan, Palo Alto, Cal.; botany, J. C. Arthur, Lafayette, Ind.; anthropology, F. H. Cushing, Washington, D. C.; and economic science and statistics, B. E. Fernow, Washington, D. C.; permanent secretary, F. W. Putnam, Cambridge, Mass.; general secretary, James Lewis Howe, Louisville, Ky.; secretary of the council, Charles R. Barnes, Morison, Wis.; secretaries of the sections—mathematics and astronomy, E. H. Moore, Chicago, Ill.; physics, E. Merritt, Ithaca, N. Y.; chemistry, William P. Mason, Troy, N. Y.; mechanical science and engineering, H. S. Jacoby, Ithaca, N. Y.; geology and geography, J. Perrin Smith, Palo Alto, Cal.; zoology, S. A. Forbes, Champaign, Ill.; botany, B. T. Galloway, Washington, D. C.; anthropology, Mrs. Anita Newcombe McGee, Washington, D. C.; and economic science and statistics, E. A. Ross, Palo Alto, Cal.; treasurer, R. S. Woodward, New York.

After the business meeting came to an end different papers were read by their authors before the members of the various sections.

On Wednesday morning the members began their last day's proceedings for the 43d annual meeting, with the transaction of business in the hall of the Polytechnic Institute in Brooklyn. The council held a preliminary meeting, and settled the details to be presented to the association. Only two of the sections remained, but the American Forestry Association and the Society for the Promotion of Engineering Education were also in session.

The general meeting was presided over by Dr. Brinton. It was voted to appropriate \$100 to Prof. F. W. Hooper, of Brooklyn, for use at the Biological Laboratory at Cold Spring Harbor, L. I., for original research. The total number of new members added to the association this year is 216. It was decided to elect to life membership the remaining original founders of the association, including Dr. Charles E. West, of Brooklyn; Prof. James D. Dana, of New Haven; E. S. Dixwell, of Cambridge; Thomas T. Bouve, of Boston; Dr. Traill Greene, of Easton, Pa.; J. H. Redfield, of Philadelphia, and Bela Hubbard, of Detroit.

A general session was held this evening in Art Association Hall, at which the final business will be transacted, but the formal adjournment will not take place until August 25th, after the return of the members to the city from excursions. The following persons have been elected fellows of the association, for their services to science, by the council of the present meeting:

Prof. Arthur Latham Baker, Rochester; Elias H. Bartley, Brooklyn; Charles Baskerville, University of North Carolina, Chapel Hill, N. C.; Frederick Bedell, Cornell University, Ithaca; Miss Mary A. Booth, Longmeadow, Mass.; William H. Bristol, Stevens Institute, Hoboken, N. J.; M. A. Carleton, Agricultural Experiment Station, Manhattan, Kan.; Prof. L. H. Charbonnier, University of Georgia, Athens, Ga.; Lellen Sterling Cheney, Madison, Wis.; James Christie, Pencoed, Pa.; Richard T. Colburn, Elizabeth, N. J.; Prof. C. S. Crandall, Fort Collins, Col.; Dr. Hilborne T. Cresson, Philadelphia, Pa.; Charles W. Crockett, Rensselaer Polytechnic Institute, Troy; John Daniel, Vanderbilt University, Nashville, Tenn.; Robert G. Eccles, Brooklyn; Prof. D. R. Ford, Elmira; Nelson H. Genung, Ardmore, Pa.; Adam Capen Gill, Northampton, Mass.; Prof. Edward Lee Greene, University of California, Berkeley, Cal.; Prof. Mark W. Harrington, chief of Weather Bureau, Washington, D. C.; Charles Willard Hayes, United States Geological Survey, Washington, D. C.; Henry Allen Hazen, Washington, D. C.; William J. Humphreys, Washington College, Chestertown, Md.; Lewis R. Jones, Burlington, Vt.; Daniel S. Lamb, Washington, D. C.; Prof. Henry Lefaver, Williams College; William H. Lennox, Brockport; Prof. Conway MacMillan, University of Minnesota, Minneapolis, Minn.; Frank O. Marvin, University of Kansas; William Metcalf, Pittsburg, Pa.; William S. Miller, Madison, Wis.; Prof. N. T. Moreland, Lexington, Va.; Prof. Edward A. Ross, Cornell University; W. W. Rowlee, Cornell University; H. L. Russell, Poynette, Wis.; Robert H. Sayre, South Bethlehem, Pa.; Samuel Sheldon, Polytechnic Institute, Brooklyn; James Perrin Smith, Leland Stanford Junior University, Palo Alto, Cal.; C. H. Smyth, Jr., Clinton, N. Y.; George B. Sudworth, Department of Agriculture, Forestry Division, Washington, D. C.; Prof. M. B. Thomas, Crawfordsville, Ind.; Edward Burton Uline, Lake Forest, Ill.; L. G. Weld, State University of Iowa; Prof. Edward H. Williams, Jr., Bethlehem, Pa.; Prof. Thomas A. Williams, Agricultural College, Brookings, S. Dak.; Dr. S. E. Wolff, Cambridge, Mass.; Carroll D. Wright, Department of Labor, Washington, D. C.

The papers before the American Forestry Association, at its 13th annual session, included one by Gen. C. C. Andrews, of Minnesota, ex-minister to Sweden-

Norway, on the "Prevention of Forest Fires." He showed that they caused losses in the United States of \$25,000,000 annually. He cited several European countries which had long managed their forests so as greatly to prevent such fires. A paper was presented by Dr. Horace E. Hovey, of Newburyport, Mass., concerning the remarkable petrified forests found in various parts of the Southwest, and particularly in Arizona. Dr. Hovey said that there was a time when regions now arid and barren were covered by dense forests and pines and cedars 200 ft. high. A photograph was exhibited showing such a tree still standing, though changed to solid stone. Generally the trees were felled, presumably by an earthquake, but after their petrification, as appears from the way in which the trunks and branches and twigs were fractured. The petrification may have been by a flood of silicious water from geysers. After prostration they were covered by showers of volcanic ashes that changed into a soft sand-stone.

The Society for the Promotion of Engineering Education has been discussing the best methods of teaching engineering in the technical schools of the country. The society was organized at the World's Engineering Congress in Chicago last year, and has a membership roll of about 150, comprising many well-known engineering educators. Among the subjects presented were: "Graduate and Post-Graduate Engineering Degrees," which was discussed by Prof. Palmer C. Ricketts of the Rensselaer Polytechnic Institute; George F. Swain, of the Massachusetts Institute of Technology; Robert H. Thurston, director of Sibley College, Cornell University. Prof. J. B. Johnson, professor of civil engineering at Washington University, St. Louis, Mo., spoke on "The Teaching of Specifications and the Law of Contracts to Engineering Students." Prof. Mansfield Merriman, of Lehigh University, read a paper on "Teachers and Textbooks in Mathematics for Technical Schools."

The excursions arranged for the afternoon included trips to Upper Montclair, N. J., for mineralogical specimens, and to the Atlantic Highlands by geologists.

The last excursion provided for the association took place Thursday, to West Point, a party of at least 2,000 going.

INDUSTRIAL NOTES.

La Belle Iron Works, at Wheeling, W. Va., is now working full force.

The first cast of iron at the Memphis Car and Foundry Works was made on August 18th.

The Gates Iron Works, of Chicago, has received an order for a lot of mining machinery, to be shipped to the Transvaal, Africa.

The Richmond Iron Company's furnace at Van Deusenville, Mass., is being put in repair preparatory to starting up in the fall.

The North Branch Steel Company's plant at Danville, Pa., is in full operation. It is now manufacturing 77½ lb. steel street rails.

The Riverside Tube Works and the Wheeling Steel Plant, at Wheeling, W. Va., have resumed operations, giving employment to a large number of men.

The Huron Iron Company, Chicago, has been incorporated by Melton S. Sanders, J. Blair Kennedy and Frank J. Grimm. The capital stock is placed at \$50,000.

The Varley Iron Works Company, Cleveland, O., has been awarded the contract to construct an iron bridge at West Bethlehem, Pa., which will cost nearly \$12,000.

At Lebanon, Pa., the East Lebanon rolling mill has started up working on double turn. It has orders for all the iron it can manufacture from Eastern parties.

The La Follette Coal and Iron Company, of La Follette, Campbell County, Tenn., has commenced to develop its coal and iron ore mines. Houses are now being built.

The Bertha Zinc Company, at Carter's Ferry, Va., on New River, has completed new reduction works to utilize the zinc carried off in the slimes and tailings from the ore washers.

The Montour Iron and Steel Company, of Danville, Pa., is in full operation, all departments running to the full capacity. Skelp iron is being made at the present time and over 700 men are employed.

The Ashland Iron and Steel Company, of Ashland, Wis., is making arrangements to blow in the Hinkle charcoal furnace on or about September 1st. It has been out of blast for some six months.

The Illinois Pure Aluminum Company, of Lemont, Ill., has an order for a 60 gallon steam jacketed kettle for the "Montgomery." This will be the same as that which is made for the cruiser "San Francisco."

It is said that the Colorado Fuel and Iron Company has signed a contract to supply the Choctaw Coal & Railway Company, of Indian Territory, with

15,000 tons of steel rails at a price said to be close to \$21 per ton.

After several weeks of enforced idleness the Otis Steel Works are again in operation. About 500 men are now at work, this being about one-third of the number employed when the plant is worked to its full capacity.

The Mabel and Ella furnaces, at Sharon, Pa., resumed on August 23d. The Sharon Iron Works and also the Stewart furnaces have resumed and several others contemplate starting. They will give employment to about 1,500 men.

The North East Rolled Forging and Machine Company has been organized at Kittery, Me., for the purpose of manufacturing machines for rolling and forging of metals. The officers are: H. P. Bartlett, president; R. A. Cameron, treasurer.

The contract for rebuilding the works of the Ellis & Lessig Steel and Iron Company, at Pottstown, Pa., to replace those recently destroyed by fire, has been awarded to Cofrode & Saylor, incorporated, of Philadelphia. The new building will be of iron.

Walter M. Stein, of Philadelphia, has an order for a washing plant for small size anthracite coal and sand, for the Carbon County Improvement Company, Weissport, Pa., also one for a bituminous coal washer for the McCreary Coal Company, Graceton, Pa.

A charter has been granted to the Longmead Iron Co., of Conshohocken, Pa. The incorporators are: Jawood Lukens, Conshohocken; James E. Salter, Philadelphia; Albert L. Murphy, Conshohocken; Lewis M. Lukens, Elizabeth, N. J.; Thomas C. Yocum and Henry M. Tracey, Conshohocken.

The Crozer Iron and Steel Company, of Roanoke, Va., has put in a new ore washer at the Rich Hill mines, in Wythe County, so as to increase the output to 200 tons per day. Over 200,000 tons have been shipped from these mines within the last eight years from six acres of land.

The Glamorgan Pipe and Foundry Company, of Lynchburg, Va., is now the name of the old Glamorgan Company, whose plant was recently destroyed by fire. A new plant is rapidly nearing completion and is expected to commence operations in all departments by October 1st.

The Whitehall Engine and Picket Ice Machine Company, of Newburg, N. Y., has issued a very complete catalogue of its ice machines, giving a full description of each. In order to accommodate its rapidly growing South and Central American trade a similar catalogue has been issued in the Spanish language.

Mr. Orlando Harvey, who was recently appointed master to look into the advisability of selling the Wellman Iron and Steel plant, has asked the court for time for another hearing. The judge refused the hearing and ordered Mr. Harvey to have his report ready to submit to the court by the first Monday in September.

The Berlin Iron Bridge Company, East Berlin, Conn., is furnishing the iron roof for the new boiler and dynamo room for the Larchmont Electric Company, at Mamaroneck, N. Y. The Geo. W. Helme Company, at Helmetta, N. J., has placed the contract for its new roasting house with the Berlin Company. The roof will be covered with the company's patent anti condensation corrugated iron roof covering.

The New Albany Steam Forge Works and Rolling Mill, at New Albany, Ind., have been sold at public auction to satisfy a mortgage of \$50,000. Alexander Dowling bought the plant on behalf of the bondholders for \$25,000. The works, which cost \$100,000, have been idle for three years, and for several years prior to their shutdown are said to have been operated at a loss. It has not been determined what disposition will be made of them.

The stockholders of the Carborundum Company, Monongahela City, Pa., met a few days ago, when it was resolved to sell \$50,000 worth of bonds and put in a new and very much larger plant. To effect this it was decided to call for a vote on issuing \$45,000 additional bonds, and a stockholders' special meeting will be held for that purpose. Several offers were placed in the hands of the committee from towns desiring the location, and making tenders of free ground and a cash bonus to secure the location of the works.

The Ingersoll-Sergeant Drill Company has added to its air compressors and other mining machinery the Pohle air-lift pump. A special department has been made of this branch of the business and placed under the direct supervision of Dr. Pohle. This pump dispenses with the necessity of valves, brackets, rods, pistons and other movable machinery under water or in the artesian well or mine. The Pohle air-lift pump is secured by a number of United States and foreign patents, and has now been before the public about two years, during which time over one hundred pumping plants have been installed in non-flowing artesian wells, water works plants, brine wells, ice factories, mines and other technical industries.

A manufacturing enterprise of importance was consummated during the week in Chicago. It involves the union of the Grant Locomotive Works, the Siemens-Halske Company of America and the

Wells French Company. The latter two companies were burned out in the recent fires in the lumber districts of Chicago, and it is now understood they will occupy the building of the Grant company in the township of Cicero. The capital stock of the new corporation (which will be called the Siemens Company) will be \$2,250,000, and the manufacture of locomotives, railroad cars and electrical devices will be conducted on a large scale. The receivers of the Grant Locomotive Works have petitioned, as a preliminary step, the County Court of Cook county for permission to allow the Siemens-Halske Electrical Company to rent the Grant works for \$12,000 a year. This petition Judge Scales granted.

Work has begun on the Illinois and Mississippi Canal, commonly known as the Hennepin Canal. At Princeton, Ill., August 23d, 130 men were put to work clearing the trees and undergrowth from the right of way, and in less than three weeks more than 2,000 will be at work constructing the ditches and in making ready for the locks. This canal, which, with the Chicago drainage canal and Illinois River, is to form an important waterway connecting the North western States with Chicago, will now be pushed forward with as much speed as the present and future appropriations of Congress will allow. The route at the east end for a distance of 35 miles has been definitely settled upon. Twelve miles of this distance has been condemned by the District Court and eight miles has been paid for and possession secured. Additional tracts are now being condemned as fast as the machinery of the court can operate. August 27th the contracts for the first four miles will be let, with the provision that active work be begun by the contractors within 10 days.

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.

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GENERAL MINING NEWS.

ARIZONA.

Graham County.

Arizona Copper Company.—This company's report for the six months ending March 31st shows the following results: Profit from copper, \$4,794; from company's stores, \$8,052; rents, \$596; railroad, \$10,570; total, \$24,012. The expenses for administration, taxes, etc., were \$4,246; interest on mortgages and debentures, \$13,438; total, \$17,684, leaving a profit balance of \$6,328 for the half-year.

Yavapai County.

Crowned King.—A new body of ore has been struck by a shaft recently sunk at this mine in Bradshaw Basin. The discovery of the new deposit was made in the lower tunnel and the ore is said to be richer than ever before encountered on the property.

Red Buck.—This 20-stamp mill at Walnut Grove has started up, there is an abundance of ore already on the dump or in sight in the mine to keep them pounding away for several months, while there is a water supply for 100 stamps. The company is contemplating putting in 20 stamps more. The water is pumped from the Hassayampa through a pipe line a little over one mile in length. The mill is built at the mine, the ore being dumped from the mouth of the tunnel into the mill.

(From an Occasional Correspondent.)

Copper Mountain.—Three men at work driving a tunnel to intersect the vein at about 300 ft. below the present workings; progress is very slow at present owing to a band of jasper having been encountered. Smelting and all other departments of this concern standing idle.

Little Jessie, Big Bug District.—Mr. J. S. Jones is taking about \$300 daily from the plates of his 15-stamp mill; in addition to this he is selling concentrates of about 3½ to 4 oz. per ton gold to the smelter at Curtiss.

Lynx Creek District.—The Lynx Creek Gold Company has a Bucyrus placer mining machine at work; giving satisfaction to the owners. The placer ground is proving profitable.

McCabe Mining Company.—This company is pushing development work and stoping only sufficient ore to meet expenses. The five stamp mill is kept busy on the free milling stuff, while the auriferous mispickel, containing 3 to 5 oz. gold per ton, and also the mill concentrates, are sold to local smelters.

Yuma County.

Harqua Hala Gold Mining Company, Limited.—The following is the estimated return for July: Ore crushed during the month, 3,261 tons; estimated gross value of gold produced, \$25,000; miscellaneous revenue, \$500; total, \$25,500; estimated total expenses, \$11,500; estimated profit for the month, \$14,000.

CALIFORNIA.

The California Debris Commission last week granted a permit to Joseph Hustler of Nevada County to mine by the hydraulic process. His mine is at Cherokee and is known as the Hustler. In his application Mr. Hustler estimated the approximate storage capacity of his proposed restraining works at 210,000 cubic yards. The permit granted allows him to wash only half an acre of ground. A number of other applications is still pending. They relate to mines in Plumas county, and the Commission has specified the works required to be constructed.

Amador County.

(From our Special Correspondent.)

New London Mining Company, Plymouth.—The English company that took a bond on the property a year ago has paid the purchase price of \$15,000. Superintendent Coleman is now working with four shifts draining the mine, after which it will be thoroughly developed. The hoist and rock crusher belonging to the Pacific company have been purchased and removed to the London mine.

Nevada County.

California Gold Mining Company.—This company has been incorporated at Salt Lake, Utah, by Albert S. Bower, Julius E. Shettle and others, the articles of incorporation fixing the capital stock of the company at \$1,000,000, divided into 200,000 shares of the par value of \$5 each. The trustees of the company consist of the five incorporators. The officers are A. S. Bower, president; M. B. Sowles, treasurer; W. A. Byers, secretary; J. E. Shettle, general manager. The property of the new company consists of the Oakland, Crown Point and Washington, situated in Meadow Lake mining district. It is indebted by an indebtedness of \$2,400.

COLORADO.

For the first 15 days in August the net value of the gold bullion received in the Denver Mint was \$338,443.92, says the Denver "Republican." This is a gain of \$208,942.79 over the amount deposited during the same period last year, or an increase of 161%.

The Suffolk Gold Mining Company, of Ophir, in San Miguel County, sent in a retort on August 16th weighing 268.53 oz. The De Lamar mill, in the Cripple Creek district, sent a retort weighing 131.46 oz. The Gold Mountain Mining and Milling Company, of Telluride, sent a consignment of 72.25 oz. From Gilpin County the Sleepy Hollow deposited 54.70 oz., the Dorris 71.19, and smaller deposits were made by the Modoc, Alps and First Centennial.

Colorado Fuel and Iron Company.—The annual meeting of the stockholders of this company was held at Denver last week. President Osgood made a short report in which he detailed the effects of the coal miners' strike on the affairs of the company. The report showed the company to be in a good condition and prepared to do a large amount of business if it can be had. The report covered the steel works at Pueblo, showing that immense plant to be in good condition and in good running order, with some business in view. The election of directors resulted as follows: J. C. Osgood, H. R. Wolcott, Dennis Sullivan, W. H. James, C. H. Toll, J. L. Jerome, J. A. Kebley, A. C. Cass, D. C. Beeman, W. L. Graham, Paul Morton, E. Thalman, G. H. Prentice; the latter was elected to succeed C. F. Meek. The old officers and executive committee were re-elected.

Clear Creek County.

Big Chief Mining Company.—This company has leased the amalgamator at Empire owned by the Raig-Burg Milling Company at that place. It is treating about 10 tons of concentrates per day from the Big Chief mine, which is located near Empire.

Costilla County.

(From an Occasional Correspondent.)

In the larger portion of the district around San Luis mining is limited. At Creede only such mines as the Amethyst and New York Chance are really working, because they can mine their ores at an almost nominal cost, and have no waste ground to remove. Everything mined whether in stoping or development work is ore and, including treatment charges and transportation, I doubt whether silver will ever get so low that those mines cannot produce it at a profit, though the difference with a normal price of silver makes an enormous decrease in the gross profits for a year's work. Several mines are being developed at Creede, however, and I understand the Judson Tunnel Company is beginning to erect a cyanide process plant to treat its low-grade ores, \$5 ore having yielded a very fair profit. The Happy Thought is being developed, and several other mines, such as the Ethel and Bachelor and Manhattan, furnish employment to a few miners each, with what results I do not know. At Platoro everything is practically idle, though it is reported that the Mammoth company is about to start up with a good force. At Summitville several mines are at work, but all on gold ores. The camp at Amizette, N. M., is practically dead, and will remain so until silver reaches a higher value, that being mainly a silver camp, though some gold is also found, all of the ore being low grade, though found in large bodies and wide veins. Prospecting work is going on everywhere. About 35 miles south of San Luis a new camp has been located where gold has been found in what appears to be paying quantities; at least the prospectors in some of the lodes located can and do

rock and pan enough gold out of the vein matter (a sort of Andesite breccia, filled with quartz and the whole considerably altered), by merely pounding up the rock, to pay for their supplies. A few months' development work will surely indicate the probable value of the product and its permanency. Several placer claims have yielded very good returns while the water supply, which is limited, lasted. Prospecting work is going on steadily at Duncan Camo, and a rich find has been recently reported from there; its truthfulness is as yet not fully established. The Anna mine near Villa Grove is now in ore, and is expected to make a shipment soon. The new camp above mentioned is located on the Costilla Estate (the southern half of the Sangre de Cristo grant) in Taos County, New Mex., about 18 miles from Costilla, an equal distance from Elizabethtown, and 35 miles from Catskill, which latter place is the nearest railroad point, being the end of the U. P. R. R. or one of its branches. The above company is doing development work in a large body of low grade auriferous pyrites, with promising prospects. As nearly as I can state in a few words a summary of the mining being done in this district is: 1, extensive prospecting; 2, working mines are gold mines, very rich silver mines, and development work; 3, new camps found (gold camps), Spring Creek, New Mex.

El Paso County.

Lawrence Chlorination Works.—According to Cripple Creek advices the De Lamar chlorination plant at Lawrence is doing well. The Moose, Portland, Independence and Raven mines are furnishing the bulk of the ore and it runs from \$35 to \$69. Under the ruling rates of freight and treatment \$35 ore is being sent to the smelters. The Lawrence plant is now successfully handling 40 tons a day. The treatment charge is \$12.50 a ton, and 95% of the assay value is paid for the gold contents. This is a better figure for the mineowners than shipping out of camp. These works contribute about \$75,000 per month to the gold product of the district. Mr. John E. Rothwell is at work on plans for enlarging and improving the Lawrence works, as well as plans for a new chlorination plant that will shortly be erected in the district. At the outstart this new enterprise will have a capacity of 80 to 100 tons in 24 hours. The location of the plant is not yet decided upon.

(From our Special Correspondent.)

Anaconda.—The property, which did so much to bring the camp prominently before the public, and subsequently did so much to give the district an unenviable notoriety, is more than self-sustaining at present. The mine is now being worked in the interest of the owners, and not at the caprice of stock brokers.

Buena Vista.—This mine, the property of the Isabella company, has a daily output of 12 tons of shipping ore, and a larger output of milling ore. About 45 miners are at present employed. The workings are principally confined to the second level.

Clayton C.—This property recently made an important strike, which gradually improves with development. The strike was made on the north slope of Gold Hill, a section of the camp which for two years has not received much attention, although only 500 yards from town.

Cripple Creek District.—The output of the camp for August will exceed by fully \$60,000 the output of any single month in the history of the camp.

Pharmacist.—The four carloads which were recently shipped from this property, and supposed to yield 10 oz. of gold per ton, sampled from 3 to 5 oz. of gold. This shaft is the deepest shaft in the camp, 375 ft. on the incline. The work at present is confined principally to the second level. One of the causes of the depreciation of this property is the strife between the three principal owners, the ex-president and general manager, owning 3,000 shares, not being allowed to enter the mine this week. This property has paid \$34,000 in dividends, the last having been paid in May, 1893.

Rising Sun.—This claim, owned by the Free Coinage Company, this week yielded some of the richest specimens ever found in the camp; they were found in the second level, and entirely in virgin ground.

Victor Gold Mining Company.—This company's property last month yielded over \$40,000 worth of shipping ore, the output of the mine being from 90 to 100 tons of ore per month. The total cost in July to ship \$40,000 was less than \$5,500. There are on the dump 7,000 tons of milling ore awaiting economical and efficient treatment by some new process. It is not the intention at present to resume the sinking of the old shaft, which is down 45 ft. at a 45° dip. The developments of the drifts are being prosecuted with the usual energy. Only two ore-sorters are employed on the mine.

Fremont County.

According to the local papers the coal mines of Florence are getting into shape for full working capacity. The mines tributary to that point are all working again except the Western Fuel Company's mine at Chandler. The Colorado Fuel Company at Coal Creek is working 200 men and is putting others to work as fast as places can be made for them. Owing to the long period of inactivity at the mine a great deal of ridding up must be done before the management can find room for its 450 men. The mine is making shipments daily. The Canon City Coal Company's mine at Rockvale is working about two-

thirds of its regular force, 500 men, and is sending out a trainload every day. The United Coal Company at Williamsburg began shipping last week and is now taking out about five cars a day. The Western Fuel Company, at Chandler, is making extensive improvements to its plant and is not ready to start; besides, the work of repairing washouts on the branch of the Denver & Rio Grande to the mine is not yet completed. A few days prior to the strike fire destroyed this company's tipples. While replacing it the company is putting in the latest improved elevators for separating all the various grades of coal and, it is said, will put in loading facilities for handling 1,000 tons of coal a day. An electric plant is also being constructed for the mine. Postmaster Wilson, of Williamsburg, and four other practical coal miners of that place have recently secured a lease upon a tract of coal land belonging to Hon. H. M. Teller, have erected a hoister and are now hoisting and shipping coal. This makes 10 coal mines that will operate in this county during the winter.

Rocky Mountain Oil Company.—This company has begun suit in the District Court of Arapahoe county against the Florence Oil Company, to recover the sum of \$8,654.62, amount claimed for oil which the Florence company, it is alleged, failed to deliver according to contract. Not caring to wait for the courts to settle the matter the Rocky Mountain company last week proceeded to tap a tank belonging to the Florence Oil Company and would not permit the local representative of the latter company to go upon the premises. Mr. A. R. Gumaer went to Fremont on the next day, and in company with Sheriff Blythe arrested two men who were running the oil pump, stopped the machinery and locked up the tank. The Florence Oil Company has a counter account against the Rocky Mountain company of \$9,000, which it claims is due for storage, hence its failure to deliver \$8,000 worth of crude oil to the Rocky Mountain Oil Company.

Lake County.

(From our Special Correspondent.)

Big Pittsburg.—Three sets of lessees are working three different shafts on this property and all are shipping. Good carbonate ore is being taken out of the Lent and Keen shafts, while a fine body of iron ore has just been opened up in the Parker shaft.

Big Six Consolidation.—For some months past very important work has been carried on in the Nettie Morgan property of the Big Six consolidation. Recently a rich stringer of gold ore was met with some 60 ft. from the shaft; and a winze was sunk on this which resulted in opening up at only a short depth a streak of 18 in. A sample taken from the whole width of the vein assays high in gold and 31 oz. of silver to the ton. This property is one of the oldest locations in the camp, and gold was found there in 1879. It seems certain that the streak just caught will lead to a large and rich body of gold ore.

Bonair Mining Company.—The shaft has been re-modeled and a fine new plant of machinery placed in position, which was started up this week. The work of draining the shaft has commenced in earnest. This property was formerly known as the Star of Hope. Just as soon as the water is taken out the shaft will be in good ore and the mine will be on the shipping list.

C. B. Thompson has filed an injunction suit against David Bitner, and Otis Graves and the Arkansas Mining Company. The suit involves about \$15,000 of rich ore shipped from the Solux Tye at Granite. Thompson claims that he has an interest with Bitner and Graves in the lease on this property, and as they refuse to acknowledge it, he now asks the Court to restrain the Arkansas Valley Smelter from paying over to the defendants any money due them for ore.

Hulda Mining Company.—In the Garbutt shaft at a depth of 425 ft. a body of sulphide has been opened up that assays 17 oz. silver and 1/2 oz. in gold. Drifting is being carried on, and the ground is to be thoroughly developed. Small streaks of ore have been encountered by the drill as it is sent downward, and the Garbutt gives promise of becoming one of the leading mines of the camp.

Star.—Lessee Clanton is working the only lease on this property at present and is shipping iron ore from two shafts, which gives a good iron excess, making shipments profitable.

Yak Mining and Milling Company.—The big tunnel is being driven slowly, and the management in the mean time will develop the big reserves in the Silver Cord property. The new mill is running and is turning out about 15 tons of concentrates daily.

Ouray County.

According to the local papers the mining outlook in Ouray county has brightened during the past two months. A large number of the mines reopened lately are either gold producers or at least carry more or less of the yellow metal to help the silver along. The Union, the Grizzly Bear and several other producing mines on Bear Creek, near the Sivyver, resumed last week, and are working fairly good forces of men. All of them carry both gold and silver. The Sivyver is working in ore which runs 2 oz. in gold and from 2 to 600 oz. in silver.

Grand View.—The mill being erected just below Ouray by the Grand View company is nearing completion. Mine and mill together will work probably 150 men. The ore is said to be rich in gold. Fifty-seven men are now employed.

Paquin.—In the Paquin district there is more activity than for several years. The Bell tunnel enterprise has helped out that district. The Calliope will soon be started, and the Bachelor continues to take out good ore.

Red Mountain.—All the great mines in the Red Mountain district are working large forces and shipping all the ore to the Durango and Silverton smelters that the Rainbow Railroad can handle. The National Belle mine alone at Red Mountain, keeps the Silverton smelter busy. Its ore carries a large percentage of copper, as well as silver and some little gold. The Yankee Girl, under new management, is taking out large quantities of ore. The Washington, a new producer in the Red Mountain district, is developing into a good mine. The Virginian and Revenue Tunnel are working more men now than they have at any time since last year, and the other mines in the Sneffels district are all making good showings, everything being considered.

Park County.

Como Iron, Coal and Land Company.—George W. Iechner is organizing a new company to consolidate with the Como Iron, Coal and Land Company, to develop and operate Mineral Hill properties in Tarryall district, says the Alma "Bulletin." The properties to be included in the new stock are the Bonny Bill, Live Yankee, Iron lodes 1, 2, 3, 4, 5 and 6, Dicky, Aldrich, Ben Hur, Pickwick and McCarthy lodes.

Rhine Mining Company.—This company's property is the old Vanderbilt lode, which lies on the south side of the Blue River, just above the Monte Cristo. The vein has been exposed for over 500 ft., and where developed has a width of about 60 ft. between walls, with a value of \$25 per ton. It is expected the company will erect a mill.

Saguache County.

Creede District.—The Manhattan lessees are driving ahead on their tunnel. They have some good mineral, but not in quantity, says the Creede "Miner." The Alpha is shipping from four to six cars of ore monthly. The grade improves with depth. The Bachelor is employing 14 men sinking, drifting and raising. They have 3 ft. of shipping ore and any quantity of low grade 30-oz. ore. No shipments this month.

Ethel.—The lessees on the Ethel are shipping a car of lead ore this week from their new opening, and it will return about 4 oz. gold, 10 to 20 oz. silver and 60% lead to the ton.

Kreutzer Sonata.—This mine has been shut down for some time, but the owners contemplate starting work at an early day. This property has shown some very high grade ore, but not in shipping quantity. The main vein has not yet been tapped.

New York Chance.—This property is in good ore and a quantity of it. The owners have stopping ground to keep up their shipments for three or four months and are continually opening up new ground. Everything is working nicely for the Chance.

Ridge.—The Ridge is in good ore and a large vein; says the Creede "Miner." The force of men will be increased at once. The owners will soon have two extra jigs in place, which will increase the mill's capacity for concentrates.

IDAHO.

Acting under instructions from the State Attorney General, the county officials are this year assessing tunnels on mining claims as taxable improvements. This action has raised many strong objections.

Boise County.

Boulder.—At this mine, says the Boise City "Statesman," the mill cleaned up \$5,000 from 120 tons of ore, and only succeeded in saving half the gold. The other half is in sulphurets, but they have saved the tailings for treatment by the cyanide process.

Mammoth.—Ten men are at work in this mine on Summit flat. The mine had been idle for a good many years. The saw mill has been cutting a large supply of timbers.

Muddy Group.—It is said that work will soon be resumed in the long tunnel run to drain this group. It is already in 1,850 ft., and has drained the shaft, which is 228 ft. deep.

South Africa.—The mill was started up recently on ore taken from the west drift at the depth of 100 ft. The ore assays well.

Wilson Placers.—Four of these placer claims at Pioneer are still running, and, should there be water enough, will continue until freezing weather.

Owyhee County.

Tip Top.—Col. G. V. Bryan has taken a bond on this mine on Florida Mountain. He proposes to sink the shaft from its present depth of 40 ft. to 100 ft. and to test its value thoroughly.

ILLINOIS.

A convention of coal operators met in Springfield, Ill., August 21st. The objects of the convention, as stated in the call, are: (1) The adjustment of the scale of mining rates throughout mining districts Nos. 1, 2, 3, 4 and 5. (2) The establishment and maintenance of a sub-district organization throughout the various fields of the State as will be presented to the convention by the State officials. (3) The propagation and maintenance of the State organization throughout Illinois, and the transaction of such other business as may be presented to the conven-

tion. President Crawford says the business condition is very unsatisfactory. There is no uniformity in prices, and the demand for the product of the mines is so slight that if all the mines in the district were run to their full capacity 1½ days per week, the product would be sufficient for the market. In northern Illinois fields, where the mines are in operation, the rate paid in most instances is about 10c. per ton below the scale adopted in June last in Springfield, notwithstanding which most of the miners in other parts of the State, where any work is doing at all, are paying the scale. The Springfield, Peoria and Canton districts are paying the Springfield scale, with the exception of the White Breast Company, which operates the Dunfermline, the Buckhart, and the Bryant mines. This company has imported 125 or 130 negroes from Kentucky and Tennessee. President Crawford has advices to the effect that the negroes have decided to go out until the white men go to work.

INDIAN TERRITORY.

Choctaw Coal and Railway Company.—The reorganization committee of this company has selected a new name for the property—The Choctaw, Oklahoma & Gulf Railroad—by which it will be hereafter known. The committee also awarded a contract for 15,000 tons of steel rails for the 120 miles extension to the Colorado Fuel and Iron Company.

MAINE.

Piscataquis County.

Monson Slate Company.—This company has recently started up the Oakland quarry, making four in operation now in Monson, besides the Merrill quarry in Brownville which the Monson company now controls.

Washington County.

Maine Red Granite Company.—This company recently took out a column 20 ft. long and 30 in. in diameter from its Shattuck quarry. The column was sent to the works at Calais to be finished.

MICHIGAN.

Copper.

Franklin Mining Company.—The opening on the conglomerate, from which rock is now being taken to the mill from the 27th level of No. 2 shaft, Franklin, was made several years ago, says the Calumet "News." The lode was found of great thickness, some 45 ft., but as far as explored at that time was not thought to be good enough to continue on. The reason was because the drifting which was done was along the middle of the vein. Now the drift is being run along the foot-wall, and much better ground is found. The intention in working once more on the conglomerate is to get enough rock from No. 2 shaft to keep up the usual amount going to the mill. The shaft on the amygdaloid is down to the boundary, and although the upper levels are not as much worked as are the lower, still not the usual quota of rock could be expected from this shaft, and it is expected, with the better showing of the conglomerate, that this quota will be maintained.

Iron—Marquette Range.

A short time ago, says the Marquette "Mining Journal," one of the sub-contractors on the Chicago canal work paid a visit to the upper peninsula, and while in Ishpeming his attention was called to the mud at the bottom of Lake Angeline, the water from which was pumped out less than two years ago. As he had a contract for removing the mud from two miles of swamp at that time, he said he would like to furnish the companies with an estimate of what it would cost to do the work, and a few days after his return to Chicago an engineer arrived here, who is now engaged in making soundings of the troublesome deposit. The Cleveland-Cliffs company has been anxious for some time to have the bottom of the lake cleared of the mud, as its Lake Shaft mine extends directly under it. About a year ago the company figured in pumping it out, but when the mine closed down this idea was abandoned. As work in the shaft has been resumed, it is quite possible that some plan of getting rid of the mud will now be adopted. The mud is very soft, and in case of a break underneath it the mine stands in danger of being damaged greatly, or perhaps ruined by having the workings flooded with it. It will run almost as freely as water, and a very small opening would let it through. The surface of the mud is now so soft that a man cannot walk over it. It has hardened somewhat near the edges, but even there it is not solid enough to sustain any great weight. In the center weeds and thistles of various kinds are growing quite thickly, but from appearances the muck will never be harder than it is now. The Cleveland-Cliffs company has a pump in operation there keeping the water out of the swamp. At times when the water is low, mud is lifted, but not to any great extent.

Iron—Menominee Range.

Chapin Mining Company.—A dispatch from Ironwood, Mich., says that suit has been begun by the bondholders of this company to foreclose the mortgage and sell the property. The company will be reorganized.

MINNESOTA.

Iron—Mesabi Range.

(From our Special Correspondent.)

A visit to the ore body near Hibbing, on the western part of the range, reveals a most astonishing condition of affairs. Test pitting and exploring has been going on here for 2½ years quietly, and

over 300 pits have been sunk in the ore. A well defined body of generally high grade ore, 3½ miles in length by from 1,000 to 4,000 ft. in width, has been exploited and is now being opened for operations. The average depth of this ore is about 80 ft. On the body the Lake Superior Iron Company, of Duluth, has three mines, worked under an operating lease by the Lake Superior Consolidated, or Rockefeller Company; the Mahoning Ore Company has three; the Sellers, one, and the Sheridan, one. The Mahoning Ore Company, which is owned by a syndicate of Mahoning Valley furnace men, has one row of four 40 acre tracts, 2 miles in length by 1,320 ft. in width, that is almost entirely ore, under from 13 to 20 ft. of earth. The Lake Superior has a tract of the same shape and much the same condition as to ore. Besides the properties mentioned the Merritt Brothers have a sublease from the Mountain Iron Company of 160 acres of a school section, where they have lots of ore. All the properties in this deposit are under lease to the operators, the price varying from 25 to 40c. a ton. The Duluth, Missabe & Northern road reaches Hibbing, which is at the eastern end of this deposit, and the Duluth, Mississippi River & Northern, which will handle the Mahoning Ore Company's product, is building, and is only two miles distant.

Cincinnati Iron Company.—This company will soon be a thing of the past if suits filed by the fee-holders this week can be won, and the indications are that they can be. They sue for an annulment of leases.

Legal proceedings for rights of way by the Duluth, Missabe & Northern for branch lines of track to the Adams, McInnis and Helmer properties, in the south of town 58-17, have begun, as well as similar proceedings for lines to the mines of the Mahoning Ore Company in town 57-21.

Lont Jack.—Formal papers of the lease of this mine to the Olver, mentioned in June in this column, have been filed. The royalty is 25c. and the minimum output 50,000 tons annually. The Olver already has steam shovels at the property, and will work it as a continuation of its present mine.

St. Louis County.

(From our Special Correspondent.)

Iron ore shipments for the season to date have been 1,650,000 tons, of which the Duluth & Iron Range road has sent out a trifle over 1,000,000, and the Duluth, Missabe & Northern road 650,000 tons. The Minnesota and Chandler mines have shipped nearly 700,000 tons, the Mountain Iron and Olver each about 300,000. Shipments are going forward very rapidly at the present time, and will be in the neighborhood of 2,750,000 gross tons for the season from both ranges.

Reports still are favorable from the new gold property on Rainy Lake at the northern boundary of the county. The five-stamp mill is to be replaced and the Little American mine is being developed in a systematic way. A second working shaft is being sunk 350 ft. on the vein from No. 1, and No. 1 is to be driven 100 ft. farther. Though the mine is on an island and the rock is a slate, water has so far not hindered. About next spring, if the work now planned is carried out, it will be possible to tell something of the probable permanency of the district.

MISSOURI.

(From our Special Correspondent.)

Joplin, Aug. 20.

The past week has showed a marked activity, particularly in the zinc mining of this district. The zinc ore market is advancing and the producers begin to feel a confidence that the market will soon reach \$20 per ton. The top price paid last week was \$19.50, with an average of about \$17.50 for the entire district. Lead ore showed some decline, opening at \$18.50 and closing at \$17.75. Considerable zinc ore has been contracted for this week's delivery at \$19.50 per ton.

Following are the sales from the different camps for the week: Joplin, 821,860 lbs. of zinc ore and 371,020 lbs. of lead, value, \$14,359; Webb City, 532,130 lbs. of zinc ore and 61,910 lbs. of lead, value \$6,084; Carterville, 1,179,860 lbs. of zinc ore and 330,300 lbs. of lead, value \$16,924; Zincite, 532,130 lbs. of zinc ore, 10,380 lbs. of lead, value \$793; Oronogo, 41,070 lbs. of zinc ore and 93,430 lbs. of lead, value \$2,157; Carthage, 195,000 lbs. of zinc ore, value \$1,910; Wentworth, 84,000 lbs. of zinc ore, value \$714; Spring City, 91,260 lbs. of zinc ore and 14,770 lbs. of lead, value \$1,072; Springfield, 86,000 lbs. of zinc ore, value \$744; Stotts City, 83,000 lbs. of zinc ore, value \$643; Aurora, 839,000 lbs. of zinc ore and 256,000 lbs. of lead, value \$10,565; Granby, 317,530 lbs. of zinc ore and 109,280 lbs. of lead, value \$4,672; Galena, Kan., 1,196,750 lbs. of zinc ore and 383,970 lbs. of lead, value \$16,898. Lead and zinc belt's total value, \$76,725.

The marked improvement in the mining industry is being felt in a favorable way by our manufacturers of mining machinery. Wm. M. Leckie, of the Joplin Machine Works, reports an improvement in trade. Shenlender's Sons have just completed and put in running order one of their large 12 in. double acting Cornish pumps at the Perry mines of Carterville, and last week shipped a carload of concentrating machinery to the Gobblin mine at Wentworth. J. W. Freeman has been sending out a number of steam hoisters.

Spring City, seven miles due south of Joplin, in Newton County, comes to the front again with a strike of silicate at a depth of 65 ft. in Jas. A. Bolen's land. The shaft has been sunk into the deposit for 26 ft. and is still in ore. Drifts have been sent

to the north, south, east and west and proved the deposit to be from 40 to 50 ft. wide. This is the largest deposit of silicate that has been opened in this district.

MONTANA.

Deer Lodge County.

Bi-Metallic Mining Company.—In the new part of the Bi-Metallic mill, which has lately been completed, fires have been lit in the furnaces, and everything in connection with the plant is moving in good shape. The operating of this plant will give employment to a large number of men. It is thought there is enough tailings on hand to keep the plant in operation about 18 months. Work in the big drain tunnel between the Bi-Metallic mine and the mill is being pushed with rapidity, and the contractors are of the opinion it will be completed about May 1st, 1895.

NEVADA.

Lincoln County.

White Pine District.—The Helene "De Lamar Nugget" publishes the following items of mining news of that district:

The tunnel on the Sunrise is now in about 175 ft. The De Lamar company has put a force of men at work developing water in Cedar Wash. Last week the company shipped several hundred pounds of ore to the chlorination works at Cripple Creek for tests on different modes of reduction.

On August 8th the Apex ledge in the Flagstaff was struck, showing a good character of ore and resembling closely, it is said, the first ore discovered in the Monitor Jim Crow. The character of the ore is talc and manganese mixed up with porphyry and quartz and gives good assay returns. The ledge was struck on the hanging wall and has been cross-cut 11 ft., the only change being that the ground is getting some harder. The tunnel made this development at a distance of 400 ft. with a force of 7 men.

Storey County—Comstock Lode.

Alta.—The south drift from the north winze was advanced to a total length of 37 ft. A crosscut was started west at a point 10 ft. south from the winze and extended 15 ft., all in quartz, but of a grade too low in value to pay for milling. We continue to extract some ore from the north stope, the average assay of which, according to car samples, is \$34.06 per ton.

Alta Consolidated Mining Company.—The annual meeting of this company was held in San Francisco last week and 104,427 shares of stock out of 108,000 shares were represented. Directors were chosen as follows: John Landers, H. Zadig, E. Goodrich, James McBoyle and W. Stauff. Mr. Landers was elected president, and J. E. Jacobus secretary. A year ago the mine was in debt to the extent of \$16,500. This has all been paid, together with operating expenses for the year, and there is a cash balance of \$1,600.

Crown Point Mining Company.—Superintendent Gorham, of this company, writes: A sudden and unexpected falling off in the water of the Carson River has necessitated the shutting down of the Mexican mill. We have over 500 tons of ore in the mill, on the road and in the dumps at the mine. As it will be impossible to work this ore until the water rises in the river, and as the time is somewhat problematical, I deemed it best to close down the mine, which was done on August 15th. The mill company has sent a man up the river to see what can be done toward securing the water that is now reported to be going to waste.

Occidental.—From the west ledge above the 400 level we continue to extract about 8 tons of ore per week of the average assay value of \$41 per ton. The ore found on the 30 level near the timber chute continues and holds up in value to about \$35 per ton. The west crosscut, started near No. 3 upraise on the 500 level, is now in 83 ft.; face in porphyry and clay. Milled during the month of July 112 tons of ore and slimes, and produced bullion valued at \$1,884.

Following are extracts from the latest weekly official letters of the superintendents of Comstock mining companies:

Consolidated California & Virginia.—In stoping out between south drifts 2 and 3 below the 1,650-ft. level in the new ore body we extracted 347 tons of ore, the average car sample assay of which was \$60.83 per ton. Shipped to the Morgan mill during the week 650 tons of ore, the average railroad car sample of which was \$61.85 per ton. Milled during the week 630 tons, the average battery assay of which was \$61.58 per ton. Bullion on hand in the assay office about \$11,000. The faces of the ore body to the south and west in the 1,650 level stopes continue to look well. On the 1,700 level, 22 ft. below south drift 3, operations during the week have been confined to timbering the south drift and putting in place square sets of timber. No advance has been made in extending the south drift, and the face remains as before reported. One thousand level.—From the bottom of the winze which was sunk 28 ft. on the east side of the main drift, 280 ft. south from the shaft station on the east crosscut was started and advanced 42 ft. in porphyry and quartz of low value. The west crosscut started from the main drift, 345 ft. south from the shaft station, has been advanced to a total length of 160 ft., continuing in porphyry and quartz formation of low value. Some repairs have been made in the main drift. The repairs to the Consolidated Virginia shaft from

the 1,100 station are nearly completed, and pipes will soon be put in place to take down to the 1,650 level the water which is flowing from the workings of the West Consolidated California & Virginia on the 1,100 level.

Savage.—On the 1,100 level we continue to extract fair-grade ore from the face of the north lateral drift from the station. This ore shows a width of about 10 ft. On the 1,050 level the west crosscut from the sixth floor of the south ore stopes was advanced to a total length of 70 ft.; face in porphyry and quartz. The last prospecting drifts, started from the 4th and 10th floors of these ore stopes, are each advanced 20 ft. The former is in low grade ore, and the latter in porphyry and quartz giving low assays. At a point 20 ft. back from the face of this drift we have started an east crosscut and advanced the same 15 ft., face in quartz and porphyry. During the week we have hoisted 25 cars of ore. Car samples average \$24.77 per ton.

Washoe County.

Reno Borax Company.—This company's works are now in successful operation, says the Reno "Journal." The marsh is situated in the extreme north-western part of the county, near the California line. The result of the first day's work under unfavorable conditions was 900 lbs. of crystallized borax.

NEW MEXICO.

Bernalillo County.

Cochiti District.—The Union is stacking ore ready for shipment. The Lone Star is now producing a lot of fine ore. Work has begun on a 90-ft. tunnel on Last Chance No. 2. The La Roba in Colla canon has an 80 ft. tunnel showing up some good ore. Some of the richest ore ever mined in the camp is now being taken out of the lower level of the Crown Point mine. The Albemarle, Pamlico, Huron and Ontario groups are showing up well.

Parties are now figuring on the building of a narrow gauge railroad from Bland to a point on the Rio Grande River where it is intended to erect large mills to treat Cochiti ores, says the Santa Fe "New Mexican."

The new tunnel through Gold Hill will be of benefit to Colla canon as well as the entire district. Work is now in progress. This tunnel will start in on the west side of Pino canon 300 ft. from the Bland townsite, running west and terminating in Colla canon, piercing Gold Hill at a depth of 950 ft. below the apex of the Washington mine. It will be 2,000 ft. in length, and will cut the veins of the Black Girl, Wilson, Iron King, Chicago, Remnant, Last Chance No. 2, Washington, Free Trade, Lone Star and King Solomon mines.

OHIO.

Stark County.

O. Young Coal Company.—This company has receded from its former position and has agreed to pay the 15% differential, which was the question at issue with the miners. The mines were opened August 20th.

OREGON.

Baker County.

Pyx Mine.—The owners of this mine, Messrs. Collier, Berry & Co, says the Baker City "Democrat," now find themselves in full possession of about \$17,000 worth of new and valuable improvements on their property, the result of the expiration of the bond on the mine held by J. G. Chapman and others.

Rock Creek Mining Company.—This company, says the Baker City "Democrat," is just now seriously considering the introduction of a chlorination plant in addition to a new mill. The mill used the past few months by the company was owned by the Robinson Mining Company and fell into the hands of Mr. P. Basche, who sold it, and it is to be taken away from its present site. This prevented its use by the Rock Creek Company, and the Beckwith mine is now without a reduction plant.

Rye Valley Placers.—There has been very active work done on these placers during the present season, the supply of water having been abundant.

Linn County.

Brazos.—This mine in the Mabel district has a shaft down 59 ft. At that point the vein is 32 in. wide, carrying free gold. A tunnel is now in 130 ft., and is expected to cut the vein about 125 ft. below the surface.

Union County.

Chicago Mining Company.—At this company's Ollie Woodman mine, the vein was reached last week. It is 26 in. wide, carrying free gold.

Estella.—This mine, also near Cornucopia, is developed by about 200 ft. of tunnel. The vein is 3 ft. wide, and the ore shows well in go'd.

Last Chance.—At this mine, near Cornucopia, a winze is down 75 ft. The ledge has increased in width from 6 in. to 5 ft. in that distance. It carries free gold.

PENNSYLVANIA.

Bituminous Coal.

At a meeting of the railroad coal operators of the Pittsburg district on August 21st, a resolution was adopted declaring that it would be unwise to operate below and in defiance of the Columbus agreement, as it would result in a return to the conditions before the great strike, which were profitable neither to the operators nor the miners. This is

taken as a threat that if the 60% rate is not generally maintained the railroad operators will also reduce the wages.

The Sonman mines, near Johnstown, resumed work on August 21st, giving employment to 200 men.

Pittsburg and Chicago Gas Coal Company.—This company last week made application to Sheriff Richards for a force of deputies for duty at the Snowden mines, where, it is claimed, the striking miners have been interfering with the new men imported by the company. Considerable disturbance has marked the attempt of the company to break the strike at Gastonville and Snowden, and the situation is alarming. Twelve deputies were sworn in by Sheriff Richards, and were sent to Snowden, which is close to the Washington county line, under command of Edward Lewis. A force of Washington county deputies are on duty at the Gastonville mines.

SOUTH DAKOTA.

Harney Peak Tin Mining Company.—In the United States Circuit Court, in New York, August 20th, Judge Lacombe made an interlocutory order continuing Dr. Albert R. Ledoux as receiver of this company. A full account of the suit was given in the "Journal" for June 30th last. The Court further appointed a hearing for August 28th, when the final form of the order will be settled. In making the order continuing Dr. Ledoux in charge Judge Lacombe said: From the documents put in evidence, it is reasonable to infer that the complainants will be able to prove at final hearing that the second mortgage of \$4,850,000, issued incidentally for the acquisition of further properties, and the cash advance to the company, was really to open the property of the corporation in order to effect a sale of so much of the stock as held by a syndicate comprising a majority of the board of trustees; that by such sale, which, but for the creating of this new mortgage, apparently could not be carried out, they obtained in exchange for their stock, not only nine-tenths of the new bonds, but also a large sum, \$400,000, in securities of another corporation, presumably valuable; that their fellow-shareholders who were not in the syndicate were in no way benefited by this transaction and obtained thereby no opportunity to sell their stock, the value of which was unnecessarily reduced by the creation of the mortgage, all the bonds under it being issued, although, as is alleged, the mining properties promised as part of its consideration were never turned over, and, as is conceded, the cash advance stipulated for was never fully paid. If the mortgage had been created in the interest of the corporation, its officers, assuming them to possess common sense, would have seen to it that the bonds were issued pari passu with the receipt by the company of the consideration. If it were issued for the purpose of enabling these officers to dispose of their own stock, it was not to be expected that they would concern themselves to secure that consideration for their company, and they seem not to have done so. The preponderance of proof indicates that the president and trustees have availed of their official positions to benefit themselves at the expense of the corporation and of their fellow-shareholders. That is quite sufficient reason for removing them from control of the books, papers and property of the corporation until the case can be tried, the facts fully brought out and the application to remove them from office finally determined. The motion to continue the receiver until final hearing is therefore granted.

TENNESSEE.

Bradley County.

It is reported that a company has been organized by Mr. Frank Arzyle, of the North American Lead and Zinc Company, of Burlington, Ia., to purchase the property of the Blue Springs Lead mines, now owned by Saml. Divine and other parties in Chattanooga, Tenn.

Hickman County.

The companies now operating on the phosphate deposits are the Duck River Phosphate Company at Totty's Bend, eight miles from Centerville; the Southwestern Phosphate Company at Fall Branch, four miles from Aetna, and the Tennessee Phosphate Company, at Nunn's Farm, three and a half miles from Aetna. The phosphate is being hauled to the railroad stations in wagons. The daily shipments from all three mines amount to about 150 tons, though the output is somewhat in excess of this. Most of the shipments are made to Atlanta.

UTAH.

Juab County.

Bullion-Beck & Champion Mining Company.—The daily output of the Bullion-Beck mine is now about 60 tons of ore of a high grade, and the amount is being increased as fast as possible, says the Salt Lake "Herald." In order to reduce the low grade rock it is now proposed to put in a 200 ton mill. It is stated that experts are now at work upon the plans of the proposed plant, and upon their completion formal consideration of the matter will be given by the directors.

Salt Lake County.

Shipments of ore and bullion from Salt Lake City for the week ending August 11th were: Bullion, 224,498 lbs.; silver and lead ores, 1,543,750 lbs.; copper matte 49,980 lbs.

The receipts of ore and bullion in Salt Lake City for the week ending August 16th were to the aggregate value of \$119,946, of which \$74,650 was in ore and \$45,296 in bullion. The receipts of Pennsylvania base bullion amounted to \$16,496, and Germaniabullion \$28,800.

Salt Lake Copper Manufacturing Company.—Rapid progress is being made with the completion of the buildings and the placing of the remainder of the finer machinery, says the Salt Lake "Herald." For some time past one furnace has been operated on Copper Mountain ore, and a second furnace will be fired up next week and operated on Copperopolis ore. The ores from these two properties are radically different, that of the Copper Mountain being exclusively copper, and that from the Copperopolis containing copper, gold and silver.

Summit County.

Mears Silver Mining Company.—A strike was made last week in the bottom of a 250-ft. incline that is being sunk from the 600 level. The vein is about 8 ft. wide, and about half of it is said to be in rich ore seams. It lies on a quartzite foot-wall with lime hanging, and all the features are similar to the Ontario and the Daly. The ore assays 240 oz. in silver per ton, some gold and little lead. The mine is thoroughly drained of water by adjacent workings.

WYOMING.

Carbon County.

Syndicate Improvement Company.—This company has received two large boilers and other machinery, which are now being set up at the Johnstown Soda lakes. The company purposes working on a large scale.

Sweetwater County.

A Rock Springs letter says that the copper deposits discovered late last fall on Gold and Mill creeks and on the east branch of the Sweetwater are attracting at this time much attention. Developments show a broad copper lead which has been traced a distance of nine miles so far. For the most part it is brown oxide of copper, carrying gold, but has not been prospected at any point to a depth of more than 15 ft. Assays show that it contains copper, gold and silver. The lead which extends across the country is 140 ft. between well defined walls. The property has been taken up by a number of miners without capital, who for some months past have been trying to interest mining men of means. A syndicate composed of Cheyenne, Denver, Rock Springs and Lander men have had the property examined with a view of doing enough development work to test the real values in the deposit. It is proposed to expend \$75,000 in work which shall show what there is at great depth, and at the same time to cross-cut the lead from wall to wall. The syndicate proposes to put in a small smelter of the capacity of 40 tons per day. William Sturgis, Jr., of Cheyenne, a man of large experience in copper mining and copper smelting, is at the head of the enterprise and he is now having tests made of the ore. The locality in which this great lead is found is about 65 miles north of Rock Springs.

Gilbert Peak District.—A number of claims have been taken up in this new camp, and preparations are being made to work on a large scale. Several claims have been bought up by Salt Lake men, who propose putting up a mill.

FOREIGN MINING NEWS.

AUSTRALIA.

During the past six years—1883 to 1893, inclusive—the output of coal from the local mines has increased considerably, the number of tons raised having been 8,573, 14,500, 14,601, 22,834, 23,363 and 91,726 for the respective years. The number of tons imported from New South Wales for each of the same years has been 611,313, 746,379, 672,631, 843,813, 739,619 and 602,136, respectively. Prices during this period have gradually decreased. Five years ago Newcastle coal retailed in Melbourne cost 25s. a ton. Two years later it had come down to 21s., the Railway Department paying in the same year 17s. 6d. a ton. Now the retail price, both of Newcastle and local coal, is about 16s. per ton. Recently a seam of brown coal, 60 ft. thick at one point, and at depths of 324 ft. and 350 ft., has been struck by the Altona Bay Estate Company on its property beyond Williamstown. The company intends setting about permanent sinking at once. It will obtain the necessary winding machinery, and hopes to have the coal on the market in six months' time. As the company has a railway line connected with the State system at Williamstown which runs to the mouth of the bore, and also a jetty giving 16 ft. of water at the end, it has every facility for speedy and cheap delivery. A Williamstown company, which has proved the existence of an 18 ft. seam of brown coal nearer the town, applied to the Premier for assistance to sink a shaft, but as it is only brown coal, and a narrow seam at that, no government help will be given.

BRITISH COLUMBIA.

(From an Occasional Correspondent.)

Boundary Creek District.

The government is building a wagon road through the district at a cost of \$10,000. It is circuitous, 15 miles long, and connects with the wagon road from Marcus, Wash., to the Kettle River, and will be an

outlet for the Wellington, Greenwood, Providence, Deadwood, Copper, Smiths' and American Boy camps, the ores from which have heretofore been shipped on horseback to Kettle River, en route to the Puget Sound Smelters. The Chief Commissioner of Lands and Works states that the road will be finished by the latter part of September.

Defiance.—Ore has been found again in place a few feet from where it cut off in the bottom of the shaft.

Skylark Mine.—A carload of ore from this mine, owned by the Spokane & Great Northern Mining Company, was smelted at Everett, Wash., on July 30th last, and reported to yield 100.40 oz. silver, 1.23 oz. gold, and 5.60% lead per ton.

The American Boy.—A cave-in of ground caused by the spring moisture has disclosed some ore on one side of the main shaft. It is being followed up, and if it continues can easily be reached by the 200-ft. tunnel already run on the quartz ledge. The tunnel starts from the bottom of the shaft, and runs parallel with the ore disclosed, which also shows in a shaft sunk on the vein about 100 ft. higher on the hill.

The Providence.—Work has been resumed, the water having been taken out of the main incline shaft. The last lot of ore shipped from this property was smelted at Tacoma, and yielded 4.30 oz. silver and \$10.60 gold. It has run as high as \$107.60 in gold.

Slocan District.

Deadman Group.—Until quite recently, this claim and the Wild Goose, although located over two years ago, and being each 1,500 ft. square, were known only to their owners, Messrs J. M. Harris, F. T. Kelly, S. M. Wharton and Evan Jones, nearly all Spokane men. The property was lately bonded for a satisfactory figure to Frank Curter and active development work commenced. The ledge had been opened in six different places for 600 ft. in length and the dump piles augmented by galena and carbonates coming from 4 ft. in width of the vein, its extreme thickness being unknown.

Rico Group.—This is the Deadman's nearest neighbor on the east, and consists of the Rico, Texas, New Denver, Clifton and Ephraim, owned by about the same parties as the Deadman, but worked by the original owners. The main Rico lode has been traced on the surface a distance of about 5,000 ft. It crosses the steep mountain in such a direction that tunnels can be run in on the vein gaining nearly foot for foot. The vein is from 11 to 12 ft. in width, in massive slate formation, with whose strata run porphyry dykes varying from 6 to 200 ft. in width. The lead cuts the formation on an angle, but has very smooth, well defined walls through all the country rock. Two tunnels have been driven on the vein, over 225 ft. in length, 117 ft. below the surface at face, and the other 353 ft. long, 325 ft. in depth at face. The ore consists of galena and carbonates, ore of high grade considering the quantity. There is now on the dump 1,000 tons of carbonates which sample 75 oz. silver and 25% lead per ton, which will pay to market when the Nakusp-Slocan railway reaches Three Forks.

MEXICO.

The following decree in relation to the gold mining concessions has been published:

The Executive is hereby empowered, during the period of one year dated from the promulgation of this law, to make contracts for the prosecuting and operating of gold mines and placers, in accordance with legislation now in force, and subject to the following conditions amendatory of said legislation:

First. The contracts shall be in the form of concessions, which the Executive shall issue freely, and upon the hypothesis that it is in possession of data sufficient to justify the belief that such concession is to cover the mining of gold in the district to be developed.

Second. For the purpose of this decree, gold mining regions shall include deposits of that metal, whether alluvial or not, as well as deposits wherein the gold is found mixed with some other metal, but where the commercial value of the gold exceeds that of the other concomitant metals.

Third. No region shall be considered as gold-bearing if the average show of metals in all the mines included therein is less in gold than expressed in the foregoing paragraph.

Fourth. As soon as the nature of the ore changes in such manner that the average yield mentioned in the foregoing paragraph is not realized, the contracts granted under this law shall be revoked.

Fifth. Each contract shall clearly specify the limits of the tract to be developed.

Sixth. Within the limits of such tract, the concessionaires can designate and acquire as many claims as can be located upon unoccupied territory, or incorporate therein claims belonging to the concessionaires prior to the date of the contract, as well as any others they may hereafter acquire by purchase or other legal manner.

Seventh. Concessionaires shall obtain prospecting permits, subject to the laws in force, all other companies or private individuals being inhibited from prospecting in that district for any kind of metals, but with the proviso that such permits shall be good for six months and no longer, and that, once lapsing and during the two years immediately succeeding, neither the concessionaires nor any other party can obtain such exceptional prospecting permits.

Eighth. The concessionaires can import into the Republic, free of import duties, the machinery, in-

struments, tools, and necessary apparatus for the purpose of prospecting and development of materials of construction for mines and metallurgical offices, provided such concessionaires first advise in each case with the Department of the Treasury, and abide by the regulations thereby imposed. Should the concessionaires sell a portion of all the supplies thus imported, without the consent of the Government, they shall lose all such supplies thus sold, and forfeit, also, all the franchises granted in the concession, unless such sale be rendered necessary by bankruptcy or liquidation.

Ninth. The concessionaires shall enjoy a rebate on the annual mining tax for a period up to ten years, paying in the first year at the rate of one-tenth of the impost in force, and an increasing amount each year until the full tax becomes payable in the eleventh year.

Tenth. During ten years' time, the concessionaires shall be exempt from all federal taxes, with the exception of the tax alluded to in the foregoing article, and with the exception of taxes payable in stamps and mintage and assay taxes or dues.

Eleventh. The concessionaires shall invest in their undertaking during the first three years a capital of \$500,000 at least, to be increased to \$1,000,000 during the following five years.

Twelfth. The concessionaires shall, within the time and the terms designated in the contract, present the plans, samples, ores, descriptive reports and geological specimens resultant upon their prospecting.

Thirteenth. The concessionaires shall allow an inspector, appointed and salaried by the Executive, to examine the work of prospecting and mining.

Oaxaca.

A press dispatch from the City of Mexico says that the government has granted to Fernando de Leresa a valuable mining concession for the working of the rich gold placers in several districts of the State of Oaxaca. The terms of the concession provide that \$1,000,000 must be expended by the concessionaire within five years, and that he must erect reduction works capable of handling 400 tons of ore weekly within two years.

Fourteenth. The concessionaires shall guarantee compliance with their obligations by a deposit of a minimum of \$10,000 in bonds of the public debt, to be furnished at the time of signing of the contract, which they cannot redeem until they have proven the investment of capital (see Article 11) of at least \$200,000. If the bonds deposited bear interest, the depositors may withdraw the coupons in due time for collection.

Fifteenth. The exemptions from taxes mentioned in the ninth and tenth articles do not include the mining of alluvial gold. In such case, the concessionaires, if discoverers thereof, shall pay, during the mining of such alluvial gold, at the rate of one-third of the imposts in force.

Sixteenth. Within two years from the date of this contract, the concessionaires shall establish a metallurgical establishment, capable of treating at least 400 tons of ore per week, or, in place of such establishment, any other concern capable, in the judgment of the secretary of public works, of such amount of work.

NEWFOUNDLAND.

A company of American prospectors recently opened an iron mine at Belle Isle, Conception Bay, Newfoundland. The ore is said to contain 54% of iron. It is reported that the company is working in the interests of the same parties who control the Dominion Coal Company.

ONTARIO.

Sudbury District.

(From an Occasional Correspondent.)

The five principal nickel mines in this district are being worked on the usual scale this season, and their total output is over 400 tons of ore a day now.

The coal strike in the United States threatened to necessitate the temporary closing down of the smelter at the Murray mine lately, but the company has managed to keep the works going with Montreal gas coke.

At the Stobie mine, which has heretofore been worked by an adit in the side of the hill, a vertical shaft is being sunk from the top of the ore bed.

An important discovery of Sperrylite (platinum) was made this week in the township of Snider, near the Tam o' Shanter mine. It was first noticed at a turned-up root in a swamp, and the deposit is evidently larger and richer than at the Vermillion mine, in Denison.

A wagon road is being built from Worthington Station to the Duluth mine, in the township of Till.

Free gold has been found in more than 40 different places in this district, and nearly all the nickel ore mined on the range carries more or less gold and platinum. But the Wahnapiatae section promises to be the richest in gold, and a wonderful discovery has recently been made there on what is known as the Pelequin claim.

A stock company is to be formed to work this property as soon as machinery and supplies can be got into it.

Preparations are also being made to test a gold claim in the township of Denison with a diamond drill. It is a remarkable fact that with all the gold discoveries made here not a single gold property

has so far been properly developed or opened up. The want of capital is the main cause.

SOUTH AFRICA.

A special meeting of the Chamber of Mines was held at Johannesburg to consider the proposed State cyanide monopoly. The executive committee, which had been considering the matter, reported that it had visited the State President, and ascertained that he was favorably inclined to establish such a monopoly. The Executive Council then addressed a communication to the government protesting against such action, and pointing out the injury which it would occasion to the mining industry. The actual terms of the proposed monopoly are as follows:

1. The State to have a monopoly of the extraction of gold from ores and tailings by the use of cyanide of potassium for a period of 20 years, the African Gold Recovery Company surrendering its disputed patent, No. 47, to the government.

2. Mr. W. W. Webster to be appointed agent for the government, with the right to refuse the use of cyanide for gold extraction in such cases as he may think fit.

3. In the event of the monopoly being canceled before the 20 years the patent above referred to to be revived in favor of the African Gold Recovery Company, and to be of force for such unexpired portion of 20 years.

A consideration of all the facts of the case shows that the monopoly would be injurious to the mining industry and that the interests of large and small producers are absolutely identical:

1. The validity of the patents held by the African Gold Recovery Company has been questioned; and should the decision of the High Court be favorable to the mining companies, the use of the cyanide process will be free to every one without charge.

2. If the patents should be declared valid they would have only a further period of 8 years to run, and under the monopoly the mining industry would be burdened by the imposition of a royalty charge for 12 years longer.

3. The African Gold Recovery Company holds two patents (both in dispute), one for the use of cyanide of potassium in certain forms and the other for the precipitation of the gold by zinc shavings. The former is to be surrendered to the government, the latter being retained by the company, which, in addition to the royalty imposed under the State monopoly, would be able to charge a further royalty for precipitation by zinc, in which case the apparent reduction of tariff might prove to be no reduction at all.

4. The proposed monopoly would give the African Gold Recovery Company the sole right to use cyanide to extract gold, and this the patent rights do not at present confer on them.

5. The company, in the event of the monopoly being abandoned by government, could not revenge itself by imposing an excessive royalty on users of the process, as by Article 21 of our Patent Law it is provided that in such a case "the Government, by advice and consent of the Executive Council, can order the patent-right holder to grant rights under such conditions as the case may require."

6. The process of recovery of gold by cyanide is still in its infancy. Since its introduction on these fields improvements have been effected by the mining companies which have materially reduced its cost, and there is every prospect to expect further improvements and further economies from the unceasing experiments being made by scientists in the various parts of the world.

Transvaal.

Witwatersrand.—The gold output of this district for the month of July was 167,953 oz. This is 210 oz. less than in June, and 1,820 oz. less than in May, but it shows an increase of 41,784 oz., or 33.2% over July of last year. For the seven months ending July 31st the output was 1,141,619 oz., against 791,150 oz. last year: 663,983 oz. in 1892, and 378,666 oz. in 1891. At the usual value of Witwatersrand gold (about 800 fine) the output this year has been equivalent to 913,295 fine oz. of gold. The largest outputs reported by individual mines for July were: Robinson, 13,929 oz.; Langlaagte Estate, 11,215 oz.; Crown Reef, 10,629 oz. gold.

SOUTH AUSTRALIA.

(From our Special Correspondent.)

Mining for gold—for other metals, though plentiful enough, hardly pay for working at present rates—is looking up in our colony. Two discoveries have been made recently, showing that we may yet rival West Australia in our gold mines. One of these is about 290 miles in a N.N.E. direction from Adelaide, and within a short distance of the Broken Hill railway line. Splendid samples of stone from the spot have been sent down to Adelaide, and the gold is thickly distributed through the matrix at the rate of hundreds of ounces to the ton. Strange to say, the locality is on the land formerly worked by the Mingary Gold Mining Company, and the spot whence the specimens were taken is only about a chain's length from the old company's shaft, and near the surface. The locality is about 16 miles to the west of the boundary between South Australia and New South Wales, and is included in the auriferous zone of country mentioned in a former letter, and which has now been proved to extend 150 miles from west to east, and about 60 from south to north. There are also other belts of auriferous country in different parts of the colony, but this, through what is called the North-eastern country, at present promises to be the richest and most extensive, covering an entire area of

about 9,000 square miles. The most recent find is near Petersburg, an important provincial town 154 miles from the city and 136 from Mingary. On seeing a sample of large blocks of stone from this place, I at once pronounced it to be some of the finest-looking matrix for gold I had ever seen; and the result proved the correctness of my opinion, for assays have shown it to be extremely rich, though the gold is so fine as to be not easily detected even by the aid of a glass. Further discoveries are reported from 40 to 50 miles north and northwest of Petersburg and east of Carrieton, another town on the Northern Railway line. Defined reefs showing gold all through the stone have been met with in several places. Unfortunately there is not sufficient capital available here for the proper development of these discoveries, and it often happens that a good mine is abandoned when perhaps \$1,000 would bring it to the paying point.

WESTERN AUSTRALIA.

(From an Occasional Correspondent.)

Western Australia is again to the front with the story of the discovery of a gold vein of extraordinary richness. The locality of the find is 12 miles from Coolgardie, a mining camp now known on both sides of the Equator. The new discovery has been named the Londonderry, and is near the Bayley's Reward, the claim whose phenomenal yield was the cause of the rush to Coolgardie. Southern Cross and other camps situated in the arid deserts of Western Australia.

In one day 1,000 oz. were obtained by the use of a dolly. Twelve thousand ounces were obtained in a few days from the yield of the outcrop of the vein. Further news will be awaited with interest. The immediate result will probably be to stimulate the exodus from Victoria and New South Wales to the new El Dorado of the more western colony. The rush to Western Australia has recently fallen off owing to unfavorable reports regarding the mines and the great natural obstacles, particularly the want of water, which stand in the way of the development of a region which has long been looked upon with a suspicious eye by Australian mining men.

LATE NEWS.

The miners of Southern and Central Illinois have adopted the Columbus scale, which, for them, means a reduction of 10%.

Mr. Eben E. Olcott has returned to New York from his professional visit to the State of Durango, Mexico. On his return he visited Colorado, where he spent a short time.

The coal mine at Pioneer, Tenn., on the Knoxville & Ohio road, has resumed operations and is producing about ten carloads of coal per day. The mine was closed about a year ago, but the recent demand for coal has caused it to resume. Every mine in the district is now operating.

Some of the debenture holders of the Jarvis-Conklin Mortgage Company have asked for the removal of Samuel M. Jarvis and Roland R. Conklin from the receivership of the company. The petition is based on the assertion that some of the transactions carried on by the receivers have been of a questionable nature, transferring properties in such a manner as to benefit smaller companies in which the receivers are said to be interested. In reply to this assertion the receivers state that the attack has arisen through an effort of some of the debenture holders to prevent the reorganization of the company, and that the statements made in the petition are largely false and the inferences grossly false and misleading.

The full analysis of the gold production of the Witwatersrand for June, issued by the Johannesburg Chamber of Mines, has just been received. It shows that during the month there were 49 mines at work in the district. The gold output for the month was: From mill, 108,008 oz.; from concentrates (by chlorination), 7,032 oz.; tailings (by cyanide process), 43,800 oz.; alluvial, 127 oz.; other sources, 4,195 oz.; total, 163,067 oz. The largest outputs reported were: Langlaagte estate, 12,083 oz.; Robinson, 12,017 oz.; Crown Reef, 10,283 oz. The Langlaagte in June passed the Robinson, which had been the largest producer up to that month. The average yield, taking the total tons reported, was 0.732 oz. per ton of 2,000 lbs. The average yield from mill was 0.467 oz. per ton, and from tailings 0.221 oz. per ton worked. At the usual rate of Witwatersrand gold, 0.800 fine, the month's output was equivalent to 134,530 fine ounces of gold.

A dispatch from Milwaukee, Wis., says: The stockholders of the Chanin Mining Company will meet here September 3d to take action in view of the proceedings brought by the bondholders' trustee for the sale of the company's property under foreclosure. The decree will be entered on September 4th and the sale will take place October 15th. Most of the stock here is in the hands of banks as collateral on Schlesinger loans on the \$1,038,000 of bonds issued last August; \$200,000 were of the first class, and of these about \$155,000 were sold and have since been partially paid out of moneys received from sale of ore. The trustee says that the proceeds of the sale of October 15th will not probably be sufficient to satisfy anything beyond the mortgage bonds

of the first class, and the shutdown of the mine is not anticipated. It is thought the property will be bid in at sale by M. A. Hanna & Co. and C. A. Chapin, who will thus secure a clean title to what is considered, by experts, to be the best paying iron mine in Michigan.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Aug. 24.

Statement of shipments of anthracite coal (approximated) for week ending August 18th, 1894, compared with the corresponding period last year:

Regions:	Aug. 18, 1894.	Aug. 19, 1893.	Difference.
Wyoming region	345,310	383,368	Dec. 38,258
Lehigh region	115,514	119,464	Dec. 3,950
Schuylkill region	205,794	200,665	Inc. 5,129
Totals	666,618	703,697	Dec. 37,079

Totals for year to date, 24,637,691 26,365,832 Dec. 1,728,141

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending August 18th and year from January 1st:

Shipped East and North:	1894.		1893.	
	Week.	Year.	Week.	Year.
Phila. & Erie R. R.	634	45,428	54	54,200
Cumberland, Md.	88,594	1,622,630	2,402	3,331
Barclay, Pa.	↑	↑	↑	35,649
Broad Top, Pa.	9,173	224,411	403	275
Clearfield, Pa.	86,110	1,314,976	2,521	1,27
Allegheny, Pa.	36,833	661,880	787	675
Beech Creek, Pa.	↑	↑	↑	977,203
Pocahontas Flat Top	68,054	1,977,031	1,725	607
Kanawha, W. Va.	↑	↑	↑	1,915,382
Totals	289,398	5,656,351	10,927	999

* Week ending August 11.

† Returns not received.

Shipped West:	1894.		1893.	
	Week.	Year.	Week.	Year.
Pittsburg, Pa.	31,898	856,011	785	997
Westmoreland, Pa.	50,332	896,235	1,238	232
Monongahela, Pa.	15,823	417,928	446	516
Totals	98,053	2,170,174	2,470	793

Grand totals

The production of coke on the line of the Pennsylvania Railroad, in tons of 2,000 lbs., for the week ending August 18th was 77,261 tons; year to August 18th, 1,699,074 tons; 1893 to corresponding date, 3,096,000 tons.

Anthracite.

The anthracite coal trade continues as quiet and dull as ever. There is a total lack of interesting features, and the situation to-day remains practically as outlined in our last week's review of the trade. There has been no improvement whatever in the demand, which is practically nil. Some live business is doing by some of the companies, but the tonnage of new sales this month shows a decrease over August, 1893, dull as the latter month was; and there is nothing to indicate that any improvement will take place before the latter part of next month.

There have been this week even more reports of "cutting" than usual. To read some of the newspaper accounts it might be thought that hostilities had broken anew with greater bitterness than before and that prices were lower than ever, but such is not really the case. We stated in this column two weeks ago the fact that some stove coal, but of an inferior grade, had sold for \$3. This week it was announced as news by some papers, which, however, neglected to state that it was not a fair market quotation, since it was not a good grade of coal. It was also stated that the Lehigh & Wilkes-Barre and the Lehigh Valley companies were cutting openly.

The facts of the case do not warrant the reports which have been published, and when we say so we call to mind the fact that our own reports have been regarded by many as somewhat pessimistic. Nobody pretends, not even the sales agents, that the July circular is maintained. July prices have never obtained; neither have June's, and it is also true that even May rates have been, and are being, shaded; but it is certainly untrue that good coal can be bought on the basis of \$3 for stove. Fair market quotations for good coal to-day are: Stove, \$3.40@ \$3.50; chestnut, \$3.40@ \$3.45; egg, \$3.25@ \$3.30, and broken, \$3.15@ \$3.20. Those who may consider these quotations as too high should remember that some of the best grades are selling for \$3.75 for stove; and the lowest price at which stove coal of an inferior grade has been sold this week is \$3.25. There are some cargoes of "rusty" and "slatey" coal in this harbor which probably could be had for less, but they certainly do not represent the market. In other words, coal is selling exclusively according to grade.

On the other hand, it is certain that prices have shown no tendency toward firmness this week. No seller is going about offering coal at these low figures, but if a man is found who has sufficient courage to buy just now he doubtless could get very good concessions. A sales agent who has more than once been accused of making very low prices said to-day: "Cutting? No, sir?" and added meditatively: "I can't find a man to sell coal to at any price." And that tells the story in a few words.

There has been some talk among some of the producers about the way in which certain interests are exceeding their allotments, and an ugly feeling is developing among those who have faithfully adhered to their percentages. It is, however, too early yet to tell how they will stand on the last day of the month. One of the accused parties acknowledged that his company had exceeded its allot-

ment, but that it would equalize matters by mining much less next week, so that by the end of the month it would be found that the percentage had not been exceeded after all. Probably the total monthly output will be greater than the tonnage recommended, but not very much. However, a few hundred thousand tons too much at a time like the present is far from wise.

There is no doubt that the policy of restriction will be enforced next month also. Our statement of a few weeks ago, that 2,000,000 tons for August would not be too small, is borne out by the present weakness in prices. A meeting of the sales agents will be held next week. The majority of the sales agents have expressed their opinion to us that an output of 3,000,000 tons for September would be "recommended," although there are some who consider this amount excessive, and declare that they will fight for an output not greater than 2,500,000 tons. That a heavy restriction must be enforced in September all agree. If the producers wish better prices than obtain today they will find it wise to keep within 2,500,000 tons next month. It is so self-evident as to require no demonstration that the mine is the best place to stock coal in when you can't sell it at a profit. But the traffic department of some of the railroads controlling coal companies does not seem to realize this. It is the old story. The railroad must make money by exorbitant coal tolls even if the coal itself is not sold at a profit. And, later, when there is no more coal, and therefore no more freight bonanza? Well, that time is a long way off, and those of the traffic managers who know French will say: "Après nous le déluge." But now they must have coal to carry, if not to sell.

From all that we can gather prices "will be left unchanged," to take care of themselves. This means that fluctuations in values will prevail until market conditions cause prices to go up little by little in spite of the sellers. If the retailers will favor the public in a similar manner the public need not complain.

As an item of historical interest we recall the fact that July prices, which are supposed to obtain today, are: Stove and chestnut, \$4.15; broken and egg, \$3.85.

The Reading Railroad reports that its coal shipment (estimated) for last week, ending August 18th, was 235,000 tons, of which 28,000 tons were sent to Port Richmond and 23,000 tons were sent to New York waters.

Bituminous.

The soft coal trade is duller to-day than at any time since the strike came to an end. It has slacked off, and it is quiet and devoid of features of interest. The coal which is being shipped to day is an old order of a month ago. An improvement must soon set in, as coal is certainly needed by consumers. Stocks throughout the country are light. Just now, however, there is in this market a certain unsettled feeling among consumers, brought about by a number of causes—a desire to await the outcome of the tariff bill, strikes at some points, such as Fall River, etc. The most active trade just now is with the more northern ports, which are earliest closed by ice. Shipments to those ports continue.

Prices are being maintained for the better classes of coal, but we hear of some "shading" on the lower grades. Quotations for alongside New York harbor are \$2.50@ \$3. Clearfield coal has sold this week for \$2.25 f.o.b. Prices at Philadelphia are \$1.85@ \$2.25, according to grade.

Transportation from the mines to tidewater continues excellent. The car supply is very good and sufficient for all demands. All rail trade continues good, but there is some difficulty in securing cars for points off the main line of the shipping railroads.

Ocean freight rates are practically without change from last week. We quote from Philadelphia: To Boston, Salem and Portland, 65c.; Providence, New Bedford, New Haven and Bridgeport, 70c.; Bath and Bangor, 65@70c.; Gardiner, 65@70c. and towages; Wareham, 80@90c.; Lynn, 75@85c.; Newburyport, 75c.; Dover, 85c. and towages; Saco, 75c. and towages.

Buffalo.

Aug. 23.

(From our Special Correspondent.)

Anthracite coal continues very dull; dealers hope that next month family orders will come in and break the present monotony. Prices unchanged. Supply ample.

Bituminous coal is also very slack, with the quoted rates nominally unchanged, but dealers will shade 10@20c. per ton rather than lose a customer, for denurage charges soon accumulate. Manufacturers take coal only for immediate requirements, but they are hopeful that September will see a marked improvement in the demand for their goods.

The lake freighting business is slow at unchanged quotations for coal to Western and Northwestern ports. Down freights on grain are a shade better, so that no advance on the up rate for coal is expected.

The shipments of coal westward by lake from Buffalo from August 15th to 18th both days inclusive were only 55,960 net tons, distributed as follows: 19,680 tons to Chicago, 17,000 tons to Milwaukee, 4,400 tons to Duluth, 2,650 tons to Marquette, 2,000 tons to Green Bay, 2,300 tons to Toledo, 700 tons to Kincardine, 400 tons to Gladstone, 5,500 tons to Superior, 850 tons to Bay City, and 400 tons to Sault Ste. Marie. The rates of freight were 50c. to Chi-

cago, Milwaukee, Green Bay and East Tawas; 40c. Portage and Marquette; 35c. to Bay City; 25c. to Toledo; 30c. to Duluth, Superior and Gladstone; p. t. to Kincardine, and 40c. to Sault Ste. Marie. Closing very dull, with indications of light movement for several days.

A letter from a Chicago soft coal dealer says: "The great center of interest continues to be the tremendous outpouring of bituminous coal from Ohio ports, which is only limited by the carrying capacity of the railroads from the mines to Lake Erie. However fast the coal may come to the Lakes there will be plenty of boats to take it away, and without any particular effort the business of the whole year will be done in four months."

A new method of handling bituminous coal from the railroads to vessels is now being tried in Ash-tabula, O. A machine is working successfully which in one hour can lift 18 cars of about 23 tons capacity each, and dump their contents into the holds of vessels with little breakage of coal lumps. Four wells at Windom, just outside our city limits, are supplying the South Buffalo Natural Gas Company with 6,000,000 ft. of gas daily. A new single gas well of 6,000,000 ft. capacity has been struck near Port Colborne, Canada, 20 miles from Buffalo.

The report in circulation that the Bell, Lewis & Yates Company had sold its interest in the Buffalo, Rochester & Pittsburg Company, and had joined the Vanderbilts to extend the Dunkirk, Allegheny Valley & Pittsburg from Warren and Falls Creek has been denied emphatically by the parties named.

Chicago. Aug. 22.

(From our Special Correspondent.)

There has been but limited buying of either hard or soft coal in this market during the past week, consumers being apparently adverse to laying in large stocks, and for the present are just buying enough for actual service. The railroads and the lake transportation lines continue to bring large quantities of coal here, and the accumulation in and about Chicago is very large. In bituminous coal Lake Erie ports have been sending large quantities to Chicago and other places. All along Lake Erie shippers are having no trouble whatever in securing boats to carry the coal, and it is said that without any particular effort the business of the whole year can be done in four months, such are the shipping facilities. Comparing this week with last it might be said that the week just over had the greater aggregate of sales to its credit, though that is not saying much. Compared with the business of four weeks ago it fades into insignificance. Prices continue to fluctuate, being made apparently with utter disregard of circular rates. Last week I gave an account of oil as a fuel on the Chicago River. This week experiments have been made with "New River" coal, that is claimed to be smokeless. The test lasted one hour and 1,400 lbs. of the coal was consumed, which is much less than the quantity of ordinary coal used for the same length of time. The experiment found the coal not absolutely smokeless, but it is 60% better than the coal now used. Each time the boilers of the tug were fired smoke poured out of the stack for from 30 to 40 seconds. It was not the dense black smoke of ordinary coal, but it came out in sufficient quantities to make it a nuisance. It can be said in its favor that the smoke arising from it is 100% more agreeable to a Chicagoan's nose and eyes, and this fact would, if it is adopted, make it much of a blessing.

Coke.—Coke continues in light demand. West Virginia and Kentucky coke still rules, but the Connellsville material is again coming here in small quantities, and that may soon arrive in sufficient amount to oust other grades. Prices are now \$4.25 @ \$1.50 per ton.

Pittsburg. Aug. 23.

(From our Special Correspondent.)

Coal.—The river coal operators have about all the coal mined and loaded they want, and are waiting for a rise in order to send out a few million bushels to the lower markets, who are getting short. The coal mined would amount from 7,000,000 to 8,000,000 bushels. There is no immediate prospect of water. The railroads report an active business, with prices fully maintained: 5@5½c. per bushel; river coal 4¼ @ 5½c. Another coal venture is noted at Myersdale, Pa., where coal operators have secured options on 500 acres of coal land near the Lisle mines, and will open as soon as there is a fair market. The Brady's Bend Coal and Iron Company, with \$1,000,000 capital, was chartered Monday. Several Pittsburgers are in the deal. The company owns 6,400 acres of coal and iron property, and will start without delay to build a railroad from Catfish, on the Allegheny River, to Butler, where connections will be made with the Pittsburg & Western Railroad. The road has been surveyed and will be 16 miles long.

Connellsville Coke.—Scarcity of water is now the largest drawback in the coke regions, which promises to continue for some time, and is causing a good deal of anxiety in the district, as each oven, before being drawn, has to be cooled with water, and requires about 100 to 125 gallons to each oven. A large number of ovens have been compelled to blow out, and others will be compelled to follow unless there is a big rain. Certain parts of the region are better supplied than others. The Youngstown works of H. C. Frick Coke Company and Percy works were blown in with full forces, the strikers returning to their places. Dunbar and all the idle ovens in that section are in operation; the English speak-

ing miners have resumed. The strike in the south end is going to pieces rapidly. Twenty five evicted families that had been living in the open air broke camp and moved back into the company's houses and went to work at other points; the clerks could not give out work checks fast enough. The week's shipment of coke from the region amounted to 5,811 cars; to Pittsburg 2,265 cars; points west 2,274 cars; east 1,272 cars; prices nominal.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Aug. 24, 1894.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Aug. 18, 1893.	Aug. 17, 1894.	Jan., '93.	Jan., '94.	Tons.	Tons.
Anthracite	52	23,716	35	16,800	1,061,041	527,947
Coke	85	81,450	79	95,900	4,250,693	2,836,939
Charcoal	35	6,316	22	3,760	295,192	133,477
Totals	172	111,482	136	116,460	5,609,926	3,498,363

Pig Iron.—In this market we do not hear of the improvement which is reported in other iron centers. We had occasion to speak directly to several consumers this week and without exception they declared that they were buying only rough iron to meet their current wants and no more. They are awaiting the improvement in general business which is expected to follow the final settlement of the tariff question. Thus there is no greater inclination to lay in the stocks just now than during the past three months.

Prices remain as they have ruled this summer. Consumers seem to realize that lower figures are impossible, and sellers know that higher rates cannot be obtained, so that it is almost tacitly understood, when a new order is placed, that the prices at which the last sale was made will hold good. Southern irons are reported firmer, but they are higher than they were a month ago. The same may be said of the Pennsylvania irons. Quotations at tidewater are as follows: Northern brands, No. 1, \$12.25@13; No. 2, 11.25@12.50; gray forge, \$10.25 @ \$11. Southern irons, No. 1, \$11.75@13; No. 2, \$11.75@11.50; No. 1 soft F., \$10.75@11.50; No. 2 soft F., \$10.25@11.25. Scotch irons are quoted Coltness, \$21.50@22; Eglinton, \$19.50@20; Summerlee, \$20.50@21.50.

Billets and Rods.—So far as actual business is concerned there has been no improvement. Billets and rods, however, are reported firmer, and as consumers' stocks are getting light it will not be long before sales at higher prices than have ruled lately will be made. Quotations are nominally: Domestic billets, \$19@20; wire rods, domestic, \$27@27.50; foreign rods, \$39@40.

Manufactured Iron and Steel.—Only a few small sales are reported this week. The market continues quiet. We quote Angles, 130@140c.; axles, scrap, 140@160c. delivered; steel, 140@155c.; bars, common, 115@130c.; refined, 125@140c. on dock; beams, up to 15 in., 140@150c.; channels, 140@150c. on dock; steel hoops, 145@175c., delivered; links and pins, 140@165c.; plates, flange, 160c.@180c.; fire-box, 180@210c.; marine, 245@270c.; sheared, 180c.; shell, 140@160c.; tank, 130@140c.; universal mill, 125@140c.; tees, 150@160c., all on dock.

Merchant Steel.—This market continues unchanged as to prices and volume of business. Quotations this week are: Tool steel, 575@625c.; tire steel, 160@175c.; toe calk, 170@190c.; Bessemer machinery, 125@150c.; open-hearth machinery, 190 @ 2c.; open-hearth carriage spring, 190@2c.; crucible spring, 350@375c.

Old Material.—We do not hear of any business doing in old material. Quotations are nominally as follows: Old steel rails, \$9.50@9.75; old iron tees, \$10.50@11.50 per ton; New York railroad scrap, \$11.50@12 per ton delivered at mill, and yard scrap at \$10; wrought turnings, delivered at mill, \$8.50@9; No. 1 wrought scrap at \$9.50@10.50 from yard, and machinery cast scrap \$9@10; old wrought tubes and pipe, \$6.50@7; old car wheel, \$9.50@10.50 New York; cast borings, \$6@6.50 delivered at mill.

Rail Fastenings.—This market continues exceedingly dull. Quotations are as follows: Fish and angle plates, 120@140c. at mill; spikes, 150@175c.; bolts and square nuts, 2@2.25c.; hexagonal nuts 2@2.30c., delivered.

Spiegeleisen and Ferromanganese.—There is nothing doing in this market. Quotations remain nominally: Spiegeleisen, 10@12½, \$21@22; 20%, \$25@26. Ferromanganese, \$51.50@53.

Steel Rails.—The steel rail market is quiet. Prices for standard sections continue \$24 at mill and \$21.80 at tidewater. It is reported that the Colorado Fuel and Iron Company has closed a contract with the newly reorganized Choctaw Coal and Railway Company to supply the latter with 12,000 tons of steel rails at low prices, said to be \$21 per ton.

Tubes and Pipe.—Business in this market continues fair. There is no change in prices. Ruling discounts are: On 1½ in. and smaller, 60, 10 and 5 for plain black pipe, and 50, 10 and 5 for galvanized; for 1½ in. and larger, 70, 10 and 5 for black, and 60, 10 and 5 for galvanized.

Buffalo. August 23.

(Special Report of Rogers, Brown & Co.)

There is a marked increase in the demand for foundry and mill irons, which comes principally in the form of small orders for urgent delivery, taxing the capacity of the few furnaces now in blast to supply. This holds true of both Southern and Northern iron, but more particularly of the latter. Prices are firmer, but as yet no quotable advance has been made. We quote on the cash basis, f. o. b. cars Buffalo: No. 1 foundry, strong coke iron, Lake Superior ore, \$11.25; No. 2 foundry, strong coke iron, Lake Superior ore, \$10.75; Ohio strong softer No. 1, \$12.25; Ohio strong softer No. 2, \$11.25; Jackson County silvery No. 1, \$15.75@16.75; Lake Superior charcoal, \$14; Tennessee charcoal, \$15.50; Southern soft No. 1, \$11.75; Southern soft No. 2, \$11.50; Hanging Rock charcoal, \$18.50.

Chicago. Aug. 22.

(From our Special Correspondent.)

There is no perceptible change in Chicago's iron market during the past week. Confidence, which has been at a low ebb for a long time, appears to be gaining considerably, which may soon result in quite a revival. Sales in all branches are coming in fairly well, and the number of inquiries indicates a feeling for the better.

Pig Iron.—No material improvement is shown in pig iron for the week, though a larger number of inquiries are noted. The sales of the week have been in lots from 50 to 1,000 tons, and the total tonnage being on about a par with previous week. The North Chicago furnaces of the Illinois Steel Works are now running on spiegel and will continue so for six weeks to come. The Iroquois furnaces at South Chicago are again running at ore, keeping at it night and day to supply the accumulation of orders. In Southern iron the demand remains limited, such sales as are being made are mostly carload lots, and indications do not point toward early betterment. Prices in both Northern and Southern remain the same as previous week, which are per gross ton f. o. b. Chicago: Lake Superior charcoal, \$14.25@14.75; Lake Superior coke No. 1, \$10.25@10.50; No. 2, \$10.00@10.25; No. 3, \$9.50@9.75; Jackson County silveries, \$14.50@15; Southern coke, foundry No. 1, \$10.75@11; No. 2, \$10.25@10.50; No. 3, \$9.75@10; Southern coke, soft, No. 1, \$10.50@10.75; No. 2, \$10.25@10.50; Southern car-wheel iron, \$17.50@18; Southern silveries No. 1, \$11.75@12; No. 2, \$11.25@11.50; Tennessee charcoal No. 1, \$14@14.50; Bessemer, \$11.50@11.75; Ohio strong softeners, \$12.75@13.25.

Structural Material.—Bridge material continues in fair demand, there having been a few good sized contracts made during the week. Building material has had a slightly better call. Quotations are f. o. b. Chicago: Angles, 150@155c.; tees, 170@180c.; universal plates, 150@155c.; beams and channels, 150@160c.

Plates.—A fair business has been transacted during the week. Tank steel is in good demand by outside buyers. Prices are: Flange steel, 170@180c.; fire-box steel, 350@450c.; tank steel, 140@150c.; boiler tubes, 75% discount.

Merchant Steel.—No decided change is observed in merchant steel. Implement makers are coming forward slowly, some few contracts having been placed, but the majority is hanging fire awaiting developments. There is quite a fair trade in small quantities on at present. Quotations are, carload lots: Smooth finished machinery, 180@190c.; tire steel, 170@180c.; Bessemer bars, 145@155c.; toe calks, 205@215c.; crucible spring, 340@365c.; tool steel 6½c. and upward; specials, 12@20c.

Galvanized Sheet Iron.—Warehouse trade remains quiet at 75 and 5% off. Mill trade is quite good at 75 and 15% off.

Black Sheet Iron.—Business in black sheet continues poor. Sales being few and for small quantities. Prices remain for No. 27 common 240@245c. Chicago.

Bar Iron.—Like previous week some fairly good sales have been made. It is noticed that manufacturers of agricultural implements are now coming forward, but they do not buy as yet with old time vigor. Sales of small quantities have increased a trifle, and the general tone of the market is better. Prices are 105@115c. f. o. b. Chicago.

Billets.—The price of billets remains at \$18@18.25, with rather an increased call over last week. Rods are noticeably in better demand at \$25.

Steel Rails.—Sales of lots up to a couple of thousand tons continues good, but the larger consumers are still holding off. Prices remain \$25@27 for standard sections.

Old Rails and Wheels.—There has been some demand for old steel and old iron rails, a few small sales having been made at \$10@10.25 for iron; old iron wheels, are quiet at \$10@10.25.

Scrap.—Buyers are very few, and the market therefore remains exceedingly dull. Quotations are largely nominal, which are: Forge, \$8.50@9. Cast borings, \$3.50@4; wrought turnings, \$4@4.50; axle turnings, \$6@6.50; mixed steel, \$5@5.50; tires, \$12.50@13; iron axles, \$13@13.50.

Pittsburg. Aug. 13.

(From our Special Correspondent.)

Raw Iron and Steel.—The improvement noted since the beginning of the month continues with a decidedly better feeling all round; business men generally feel that they are masters of the situation,

The tariff question being practically disposed of, they can now go ahead and make their preparations for the fall and winter trade, something they were unable to do before the present time.

Finished material is in firm demand for moderate-sized lots. At the works all employed. For steel rails there is no change in the situation; prices, \$24 @ \$25 f. o. b. at mill.

COKE SMELTED LAKE AND NATIVE ORE. Tons. Bessemer, Sept. 5,000

Table listing various iron and steel products, their quantities, and prices. Includes items like Bessemer iron, pig iron, muck bars, and various grades of steel.

Philadelphia. Aug. 24.

(From our Special Correspondent.)

Pig Iron.—The continued demand for most kinds of iron at the general advance which went into effect two or more weeks ago has kept up a fair movement of forge, but makers are afraid mills will soon be supplied.

Muck Bars.—The expectation of a larger supply of soft steel has lessened the demand for late deliveries of muck bars.

Steel Billets.—No change; one difficulty after another unsettles the coke supply. The buyers East are in urgent need of billets, and unless they can have more soon will be obliged to disappoint customers.

soon. Present delivery where possible is made at \$19.50.

Merchant Iron.—Good reports are made from nearly all bar mills this week. Business is by no means booming, but there is a steady retail demand that is encouraging.

Nails.—The general improvement incident to the latter part of August is leading to the larger distribution of nails, but at shaded quotations from last week where large lots are wanted.

Skelp.—Buyers have made no move this week to place orders for two large enterprises near at hand. Bids are under consideration.

Sheets.—Galvanized lots have been shipped freely from stores this week to small users. Black sheets are active.

Pipes and Tubes.—Small contracts have been booked for quick shipment.

Plates.—There is more stir for business and some sharp competition for new work at the quarter cent advance over July prices.

Structural Material.—Large orders are promised within two weeks, but it would be guesswork to say where they will go.

Steel Rails.—Repairing requirements are larger. Standards, \$24.

Old Rails.—Sealing at \$11.50.

METAL MARKET.

NEW YORK, Friday Evening, Aug. 24, 1894.

Gold and Silver.

Prices of Silver per Ounce Troy.

Table showing prices of silver per ounce troy for August 18, 20, and 21, including London and New York prices.

Silver has experienced a sharp rise this week, touching 30 1/2 d. on the 22d, when free selling from this side caused a reaction.

The United States Assay Office at New York reports the total receipts of silver at 141,000 oz. for the week.

Gold and Silver Exports and Imports at New York, Week Ending August 18th, 1894, and for Years from January 1st, 1894, 1893, 1892.

Table showing gold and silver exports and imports for the week ending August 18th, 1894, and for the years 1893 and 1892.

The gold imported for the week came from the West Indies; the small amount exported went to South America. The silver exported went to London and Paris; the imports were from South America.

During the five days ending August 23d the imports and exports of gold and silver from the port of New York were as follows: Imports, gold, \$892,661; silver, \$360. Exports, gold, \$587,500; silver, \$520,200.

Gold and Silver Exports and Imports of the United States, at all Ports, for July, 1894, and for Seven Months to July 31st, 1894, 1893.

Table showing gold and silver exports and imports for July 1894 and for seven months to July 31st, 1894 and 1893.

The statement includes all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

NOTES OF THE WEEK.

The signs of improving business continue to multiply, and with the settlement of the tariff question a still more rapid improvement is promised.

settled yet, and there are labor troubles in some other quarters; but most of these, it is believed, will soon be in a fair way to settlement.

The statement of the New York banks for the week ending August 18th shows increases of \$1,766,900 in reserve, \$1,676,100 in loans, \$3,852,400 in deposits and \$1,791,200 in legal tenders.

The statement of the United States Treasury on Thursday, August 23d, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

Table showing Treasury balances in excess of outstanding certificates for August 16, 23, and changes.

Government deposits with national banks on August 9th amounted to \$13,984,965, an increase of \$629,878 during the week.

The treasury receipts have been large, owing in part to the withdrawal of goods from bond and in part to heavy internal revenue payments.

There is a report that Secretary Carlisle will soon retire from the Treasury and Mr. Wilson, of West Virginia, is named as his successor.

The following statement from the Bureau of the Mint shows the deposits of gold and silver at the mint and assay offices of the United States during the month of June:

Table showing deposits of gold and silver at the mint and assay offices for the month of June.

The large amount of gold is to be noted.

The necessity of immediate and thorough organization was discussed at a special conference of the American Bimetallic League which convened in Washington August 16th.

The trouble with the League is that the persons who at present control its policy are not intelligent bimetallicists, but rather silver monometallicists.

The Bank of England on Thursday, August 23d, reported its total gold holdings at £39,597,114, an increase of £14,778,975, as compared with the corresponding date last year.

The Bank of France on Thursday, August 23d, reported its total specie holdings at 1,901,282,000 fr. gold and 1,267,481,000 fr. silver.

The report of the Bank of Russia for July 16th (July 23th), gives its specie holdings at \$213,600,000 gold and \$111,436,800 silver.

The accumulation of gold in England, and indeed in all the European countries, continues. In England there is serious concern over the continued increase of idle capital.

dented. At present there seems to be no hope of a change; the indisposition to run any risk and the demand for safe investments continue.

Imports and exports of gold and silver in Great Britain for the seven months ending July 31st were as follows:

	Gold.		Silver.	
	1893.	1894.	1893.	1894.
Imports	£13,411,316	£18,135,928	£6,762,875	£1,693,483
Exports	6,845,128	4,219,743	7,539,385	7,782,061

Excess: I. £3,566,188 I. £13,916,185 E. £174,519 I. £1,088,581

The very large increase in gold imports this year is the notable feature of this statement. The excess of gold imports over exports this year is more than twice the amount for the corresponding period of last year.

The Board of Trade returns for the six months ending June 30th give the total merchandise imports and exports of Great Britain as below:

	1892.	1893.	1894.
Exports	£111,861,090	£107,778,030	£106,883,000
Imports	212,600,000	197,519,000	211,070,000
Excess of imports	£100,739,000	£89,741,000	£104,187,000

Of the totals in 1894 about 25% of the imports were received from, and 35% of the exports sent to, British colonies. This trade shows a larger proportion of increase than that with foreign countries.

A strong demand for silver for the East is reported for London, and it is said that heavy purchases have been made for Chinese account. There are reports of a Chinese loan to be placed in Europe, probably through German bankers; the amount is not certain as yet, but \$10,000,000 is probable. This would require a considerable amount of silver, since payments will be made chiefly in the white metal.

The London "Statist" of recent date says: Gold is still being sold by the natives in India, though on a much smaller scale than some time ago. Last week about £60,000 worth was shipped from Bombay, and this week there is a moderate amount offering for sale. If exchange falls the probability is that the shipments will largely increase; but if exchange is maintained then the shipments will not be large. This continued sale of gold has greatly helped the Indian Council in disposing of its drafts, and if it continues—more especially if it increases—it may enable even freer and larger sales. On the other hand, India for some time past has been importing silver in very considerable amounts, nearly £150,000 worth a week. If that goes on, it will be a serious matter for the Council. It will be recollected how the immense imports of silver last year prevented the Council from selling. If they become large this year they will necessarily lessen the demand for Council drafts. It would appear, then, that as the natives are selling gold they are buying silver. At first the best judges were rather of opinion that the imports of silver were speculative; but they would hardly continue on such a scale if that were so. At all events, the imports of silver into India, if they continue, will be serious for the Council.

It does not appear, however, that the causes to which the "Statist" refers have as yet affected the course of exchange. This week there has been a marked rise, Council bills selling at 13½d. per rupee for 20 lakhs of special drafts, and 13¼d. for ordinary bills. This is an increase of about ½d. over last week's rates. Much of this gain is due to the strength of silver on the war news from the East. But if silver should increase it will check the Indian sales of gold again, as it has done before, a slight rise being quite sufficient for this purpose.

The complete official report on the foreign trade of the German Empire for 1893 has been published. The total value of the imports for the year was \$1,033,517,500. The proportion furnished by various countries was as follows:

	Per cent.		Per cent.
Great Britain	15.9	Switzerland	3.5
Austria-Hungary	14.0	Brazil	3.0
United States	11.1	Australia	2.3
Russia	8.5	Argentina	2.3
France	5.8	Roumania	2.0
Netherlands	5.2	Cuba	1.9
Belgium	4.6	Sweden	1.5
British India	4.3	Denmark	1.2
Italy	3.6		

The total value of the exports for the year was \$811,140,500, going to different countries in the following proportions:

	Per cent.		Per cent.
Great Britain	20.7	Sweden	2.2
Austria-Hungary	13.0	Brazil	1.9
United States	10.9	British East India	1.4
Netherlands	7.4	Roumania	1.3
France	6.3	Argentina	1.3
Switzerland	5.8	Turkey	1.3
Russia	5.7	Norway	1.2
Belgium	4.6	China	1.0
Italy	2.6	Spain	1.0
Denmark	2.5		

The small portion to Eastern and South American countries is to be noted. It is these exports which the German manufacturers are just now working so hard to increase.

The coinage of the Austrian Mint at Vienna for the period from September 30th, 1892, to June 30th, 1894, was as follows: Gold 20-kroner pieces, value \$1,249,000 florins; silver kroner, value 33,679,000 fl.;

nickel 20-heller pieces, 7,395,000 fl.; nickel 10-heller pieces, 3,178,000 fl.; bronze 2-heller pieces, 917,000 fl.; bronze 1-heller pieces, 190,000 fl. The total value of the coinage for the period was 176,526,000 fl. This unusual activity was due to the preparations for the currency reforms now nearly completed.

The Hungarian Mint at Kremnitz last year coined pieces of a total value of 72,200,000 fl. Like the Vienna mint it is still actively at work.

The following is the text of a decree issued by the Government of Guatemala: From and after August 1st, 1894, holders of Chilean, Peruvian and other silver coin will apply to the National Mint to have the same changed into national money. Foreign money which may still be unchanged on September 15th next shall be stamped as national coin, and only in this way shall it be legal tender in the Republic until it is received. From said date the importation of foreign silver money is prohibited. Persons visiting the Republic may import sums not to exceed \$300 per capita. The Government will provide the country with the national gold and silver money which may be necessary for business affairs.

A somewhat unexpected fact is the continued low value of Chilean paper money reported. At latest dates the peso or dollar was quoted at about 25c., or about 50% discount from the silver peso. The government of Chile is apparently strong and there is no reason to doubt that specie payments will be resumed on July 1st, 1896, the date set by law, when the paper currency will be redeemable in silver. The effect of the present depreciation is to decrease the imports, while giving an impetus to the export trade.

As to resumption the Government is in a strong position. On July 1st there were 29,527,217 pesos in government bills outstanding. To meet these the treasury had already in gold and silver \$1,875,177, while by law the sum of \$7,500,000 from the sale of nitrate grounds is to be set aside for redemption purposes. If the October sale proves as successful as the one held in June there will be nearly enough money in the treasury to pay off the notes, and the balance needed can be easily supplied from revenue.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars	\$51½	\$52½
Peruvian soles and Chilean pesos	51½	52½
Victoria sovereigns	4.87	4.90
Twenty francs	3.86	3.90
Twenty marks	4.75	4.83
Spanish 25 pesetas	4.78	4.83

Other Metals.

Copper.—The improvement, noted in our last, made additional progress during the early part of the week. The tone of the market was very strong, and the price of Lake copper advanced to 9¼c. When that level had been reached, and every appearance warranted the belief that the betterment would last, it became noised about that the Calumet & Hecla Company had again sold to consumers at 9c. This time the quantity involved is understood to be between 15,000,000 and 20,000,000 pounds, and deliveries are to be spread over October, November and December. The reason of such a sale being made at a price lower than the market justified and for such far-off deliveries is probably to be found in the fact that while last year certain producers did a large export business and a smaller domestic trade, this year they are desirous of reversing the quantities, leaving it to others to supply the foreign market, which they will now be more or less forced to do as the larger of the American manufacturers have been provided for up to the end of the year. This circumstance has, of course, affected prices, which have now to be quoted as 9@9½ for Lake, 8¾ for electrolytic and 8¾ for casting copper.

Abroad, the advance continued until £40 7s. 6d. for spot and £40 15s. for three months G. M. B's was reached. Then it became known what the Calumet company had done, and, in spite of the better feeling because of the passage of the tariff bill and the withdrawal from the market, as sellers, of the important American producers, the market began declining, and closes at £39 17s. 6d. @ £40 for the respective deliveries mentioned above. Some orders for the better grades of copper were cabied over before the decline set in, but the aggregate quantity was not large.

We quote: English tough, £41 10s. @ £42; best selected, £42 @ £42 10s.; strong sheets, £50 @ £50 10s.; India sheets, £47 10s. @ £48; yellow metal, 4¼d.

Imports of copper into Great Britain for the seven months ending July 31st are reported as below, in tons of 2,240 lbs.:

	1892.	1893.	1894.
Ore	49,859	42,522	44,540
Regulus and precipitate	83,549	68,017	43,562
Metal	20,064	18,438	35,006

During the current year the amount of copper imported in metallic form has largely increased, while matte and precipitate show a corresponding decrease.

Copper Exports.—The exports of copper from the port of New York during the week ending August 23d were as follows:

	Pigs	Tons
Liverpool—Euclid	113	
" Bovic	175	

Bremen—Salm.....Bars 20 "
Bordeaux—Wallachia.....Bars 50 "
Leighorn—Imizative.....Ingots 25 "
Liverpool—Germania.....Pigs 82 "

Our special correspondent reports no exports of copper from the port of Baltimore during the past week.

Tin.—For a while this week the upward movement continued, but, the advance having been rather overdone and the values of silver commencing to decline, there came a reaction, and at the close we have to quote 19½. But very little support was given to the market, as dealers and consumers became very loath to do anything when it developed that, possibly, it would be necessary to export and reimport the tin that is now in bonded store in order to get it in free of duty. This is a point which has not yet been settled, and cannot very well be, until after the tariff bill has become a law.

The close in the London market, which has, of course, followed the same path ours has, is at £69 17s. 6d. @ £70 7s. 6d. for spot and futures respectively.

Lead.—The market has ruled quite steady at about 3 30 @ 3 35 for spot and 3 ¼ @ 3 30 for futures, but the amount of business done has been limited, also because of the tariff uncertainty.

On Thursday prices in London were established at £10 2s. 6d. @ £10 5s., but, within 24 hours, these figures gave way to slightly lower ones, showing that the market for this commodity is weakening along with those for others.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: "Lead quiet at 3 17 ½c. for spot, and August-September 3 15 @ 3 17 ½c. The majority of buyers are looking for lower prices."

Spelter.—The demand has been fitful, but, on the whole, very unsatisfactory, and while prices are unchanged from a week ago, the market is not as firm.

The London quotations are £15 11s. 3d for G. M. B. spelter and £15 13s. 9d. for specials.

Antimony is unchanged at 8¼c. for Hallett's; 8½c. for L. X., 10c. for Cookson's, and 10c. for U. S. French Star.

Quicksilver.—There is little doing in this market. Quotations remain: New York, \$36; London, £6 3s. 6d. @ £6 5s.

Aluminum.—Current quotations show some reduction, and are as follows: No. 1 being over 98% pure metal, and No. 2 over 94% pure; No. 1, in rolling ingots, 63c. per lb. for small lots at factory; 60c. in 100 lb. lots; 58c. in ton lots. No. 1 in ingots for remelting, 60c. for small lots, 55c. for 100 lb. lots, and 53c. in ton lots. No. 2 in ingots for remelting, 55c., 53c. and 50c. per lb., according to size of order. Sheets, 80c. @ \$4.40 per lb., according to size and thickness. Wire, \$1 @ \$2 50 per lb., according to gauge. Castings, 90c. per lb. up, according to number, weight, patterns, etc. Tubes, from 20c. to \$3.15 per foot, according to thickness and diameter.

Abroad quotations for 99% pure metal in Paris are 6'25 @ 7'75 fr. per kilo. for ingots; 7'50 @ 11'50 fr. for sheets; 11 @ 17'50 fr. for wire, and 19 @ 22 fr. for tubes. The Neuhausen Company quotes No. 1 (guaranteed 98% pure, and in fact 99'75%) at 5 francs per kilo. for ingots in small lots; for large lots a considerable discount is allowed.

Bismuth.—Recent quotations on the New York Metal Exchange are \$2 per lb. for lots of 500 lbs. or over; \$2.25 @ \$2.50 per lb. for smaller lots.

Magnesium.—No quotations are to be found for this metal in New York. Prices in Germany are, for lots of over 10 kilos.: Ingots, \$6.75 per kilo.; bars, \$6.50; powder, \$9; ribbon and wire, \$9.50. For orders of less than 10 kilos., 25 cents per kilo. must be added for ingots or bars, and 50 cents for ribbon, wire or powder. These prices are delivered at works; the Aluminum und Magnesium Fabrik, Hemelingen, Germany, is the only maker of the metal in commercial quantities.

Nickel.—Quotations are nominally 40 @ 48c. per lb., according to grade. Business is dull, and some sales have been made below these figures, say 39 @ 45c. Abroad the demand has also been light, and prices have a downward tendency.

Platinum.—Abroad the prices are unsettled and tending upward owing to light supply.

For chemical ware, hammered metal. Messrs. Eimer & Amend, New York, quote crucibles and dishes 41c. per gram for orders of over 250 grams; 43c. for orders of 100 grams or over, and 45c. for small lots. Wire and foil are 40c., 41c. and 42c. per gram, respectively, for orders of the quantities named. Current retail prices for crucibles are 50c. per gram.

Phosphorus.—Quotations continue steady at 50 @ 52½c. per lb. f. o. b., New York or Philadelphia.

Sodium.—Abroad the price continues steady at 90c. @ \$1 per lb. Sales in this market are too small to furnish quotations.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Aug. 24.

Heavy Chemicals.—A slight improvement is reported in this market owing to the better inquiry for the various chemicals. Caustic soda has been quiet, but it is expected that after the tariff bill becomes a law there will be a better demand for it. Carbonated soda ash and alkali are in better inquiry. Sal soda is quiet and unchanged in price. Bleaching powder continues very dull.

NEW YORK MINING STOCK QUOTATIONS.

Table with columns for Name and Location of Company, Dividend-Paying Mines, and Non-Dividend-Paying Mines. Includes sub-headers for Aug. 18, 20, 21, 22, 23, 24 and Sales.

Dividend shares sold, 2,395. Non-dividend shares sold, 700. Total shares sold, 3,095.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, Aug. 17, 18, 20, 21, 22, 23, 24, and Sales. Lists various mining companies and their stock prices.

Dividend shares sold, 6,890. Non-dividend shares sold, 7,416. Total shares sold, 14,306.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Name of Stock, Aug. 18, 20, 21, 22, 23, 24, and Sales. Lists coal and railroad stocks.

Total shares sold, 83,482.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Name of Stock, Aug. 18, 20, 21, 22, 23, 24, and Sales. Lists industrial and trust stocks.

Total shares sold, 903,580.

COLORADO.

Table with columns for Name of Company, Aug. 17, 18, 20, 21, 22, 23, 24, and Sales. Lists Colorado mining stocks.

CALIFORNIA. San Francisco.

Table with columns for Name of Stock, Aug. 17, 18, 20, 21, 22, 23, 24, and Sales. Lists California mining stocks.

UTAH.

Table with columns for Name of Company, Bid, and Asked. Lists Utah mining stocks.

FOREIGN.

Table with columns for London Quotations, Buyer, and Seller. Lists foreign mining stocks.

MARYLAND.

Table with columns for Name of Company, Bid, and Asked. Lists Maryland mining stocks.

PENNSYLVANIA.

Table with columns for Name of Company, Bid, and Asked. Lists Pennsylvania mining stocks.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, Capital Stock, Shares, Par, Assessments (Total Levied, Date and amount of last), Dividends (Total paid, Date and amount of last), and Name and Location of Company, Capital Stock, Shares, Par, Assessments (Total levied, Date and am't of last). The table lists 148 companies and their financial details.

G., Gold, S., Silver, L., Lead, C., Copper, B., Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$12,300,000. § Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. ¶ Previous to this company's acquiring Northern Belle, that mine paid \$2,400,000 in dividends against \$425,000 in assessments.

COLORADO.

Table with columns: Aspen, Aug. 16, Price. Items include Argentinum-Juniata, Aspen Contact, Aspen Deep Mining, Best Friend, B-Metallic, Bushwacker, Delt, Gold Valley Placer, Little Annie, Moue Gibson, P-mtlac, Smuggler, St. Joe & Mineral Farm, U. S. Paymaster.

Colorado Springs.

Table with columns: Cripple Cr'k (gold): High, Low, Sales. Items include Alamo, Anaconda Gold, Anchoria Island, Aola, Argentinum Juniata, Bankers, Blue Bell, Bub Lee, Calumet, Columbine, Cripple Creek Con, Creede & Cripple C., Enterprise, Garfield-Grouse, Gold and Globe, Golden Eagle, Golden Dale, Gold Standard, Gould, Granite Hill, Isabella, Jack Pot, Lottie Gibson, Mollie Gibson, Mount Hosa, Mutual, Opbir, Pharmacist, Portland, Summit, Union, Virginia M., Work, World.

Total shares sold.....1,228,300

PENNSYLVANIA.

Table with columns: Pittsburg, Aug. 23, Bid, Asked. Items include Allegheny County Light, Bridgewater Gas, Chartiers Hock Coal, Chartiers Valley Gas, Fisher Oil, Hazlewood Oil Co, Lanter Mining Co, Manufacturers' Gas, Monongahela Nav. Co, Monongahela Water, Nat. Gas Co. of W. Va., N. Y. & Cleve. Gas Coal, Olive Valley Gas, People's Nat. Gas, People's Pipeage Co, Pennsylvania Gas, Philadelphia Co, Pittsburg Gas Co, Pittsb. Plate Glass Co, Stand. Undergr. Cable Co, Tuna Oil, U. S. Glass Co., pref., U. S. Gas, pref., Westinghouse Air Brake, Westingh'se Elect., 1st prf, Westingh'se " com, Wheeling Gas.

MISSOURI.

Table with columns: St. Louis, Aug. 21, Closing quotations: Bid, Asked. Items include Adams, American & Nettie, Colo., Bl-Metallic, Mont., Kitzabath, Mont., Granite Mountain, Mont., Hope, Leo, Small Hopes.

MONTANA.

Table with columns: Helena, Aug. 14, (Specially Reported by S. K. Davia), Bid, Asked. Items include Bald Butte (Mont.), Benton Group (Neilhart), Mont., Combination (Phillips'g), Mont., Double Eagle (Spotted Horse), Maiden, Helena & Frisco, Helena & Victor, Mont.

Table with columns: Iron Mountain (Missoula), Mont, Plogan (Marysville), Mont, Footman (Coeur d'Alene), Idaho, Whitlach Union & Macintyre.

MINNESOTA.

Table with columns: Duluth, Aug. 21, LISTED STOCKS, Par, Bid, Ask'd. Items include Biwabik M. Iron Co, Cincinnati Iron Co, Clark Iron Co, Great Northern Min. Co., Kanawha Iron Co, Keystone Iron Co, Lake Superior Iron Co, Lincoln Iron Co, Mesaba Moun. Iron Co, Minneapolis Iron Co, Mountain Iron Co, Shaw Iron Co, Security Land & Exp. Co.

Table with columns: UNLISTED STOCKS, Bid, Asked. Items include Adams Iron Co, Ashland Iron Co, Buckeye Iron Co, Buffalo Land & Exp. Co., Chandler Iron Co, Charleston Iron Co, Cleveland Cliffs Iron Co, Chicago Iron Co, Detroit Iron Co, Elmira Land & Iron Co, Great Western Mining Co, Homestead Iron Co, Internat'l Development, Jackson Iron Co, Lake Supr. (Marquette), McCaskill Mining Co, Mesaba C. L. & Ex. Co., Mesaba Chief Iron Co, Mesaba Iron Co, Metropolitan L. & L. Co., Northern Light Iron Co, Ohio Mining Co, Ophir, gold, Penn. Iron & Steel Co., Pioneer Iron Co, Pittsburg & Lake A. Co., Putnam Iron Co.

FOREIGN.

Table with columns: Shanghai, China, July 20, (Special Report by J. H. Bissett & Co.), Taels. Items include Hong Kong Electric Co, Jelebu Mg. & Trading Co., Ltd., Punjom Mining Co., Ltd.

Table with columns: Raub Allan G. Mg. Co., Ltd., Shanghai Gas Co., Sheridan Con. Mg. Co., Colo.

Paris, France, Aug. 13.

Table with columns: Acieries de Creusot, Acieries de France, Acieries de la Marine, de St. Etienne, Aguas Tendas, Anzin (coal), Callao, Cape Copper, Carmaux, Champ d'Or, De Beers Consolidated, Humbrowa, Huanchaca, Jerez-Lanteira, Kebao, Laurium, Greece, Lexington, Mont, Malfidano (new shares), Mokta-el-Hadid, Nicose, New Caledonia, Phosphates de France, Placers Haute Italie, Pontgibaud, Rio Tinto, Spain, Robinson (Transvaal), Soufres Romaines, Tharsus, Spain, Transvaal Coal, Uruguay, Vieille-Montagne, Belgium.

ASSESSMENTS.

Table with columns: COMPANY, No, Divdt. in office, Day of sale, Amt. per sh'r. Items include Bullion, Nev., Chollar, Nev., Gould & C'rry, Nev., Gray Eagle, Cal, Osborn Hill, Nev., Overm. n Silv. Mg., Nev., Potosi, Nev., Savage, Nev., Sierra Nevada.

CURRENT PRICES.

Table with columns: These quotations are for wholesale lots in New York unless otherwise specified. Items include Acid-Acetic, chem. pure, Commercial, in bbls. and cys., Carbonic, liquefied, Chromic, chem. pure, for batteries, Hydrocyanic, dilute, U. S. P., Hydrocyanic, U. S. P., Hydrofluoric, Alcohol-95%, Absolute, Ammoniated, Alum-Lump, Ground, Powdered, Aluminum Chloride-Pure, Amalgamating solution, Sulphate, Ammonia-Sal., in bbl. lots, Carbonate, English and German, Muriate, white, in bbls., Aqua Ammonia-(in cys.), Antimony-Oxymur., Argon-Red, powdered, Arsenic-White, powdered, Red, Yellow, White at Plymouth, Asbestos-Canadian, Italian, Ashes-Pol, 1st sort, Pearl, Asphaltum, Prime Cuban, Hard Cuban, Trinidad, refined, Egyptian and Syrian, Californian, at mine, at San Francisco, Barium-Carbonate, pure, Carbonate, commercial, Chlorate, crystal, Chloride, commercial, Iodide, Nitrate, Sulph. Am. prime white, Sulph. foreign float, Sulph. off color, Carb. lump, f. o. b. Liverpool, No. 1, Cask, Runcorn, No. 2, base, Runcorn, Saurite, Bichromate of Potash-Sooton, American, Bichromate of Soda, Borax-Refined, San Francisco, Concentrated, Refined, Liverpool, Bromine, Cadmium Minion.

Table with columns: Cadmium Iodide, Chalk, Precipitated, China Clay-English, Domestic, Chlorine Water, Chrome Yellow, Chrome Iron Ore, Chromalum-Pure, Commercial, Cobalt-Oxide, Copper-Sulph. English Wks., Vitriol (blue), ordinary, extra, Nitrate, Copperas-Common, Best, Liverpool, Corundum-Powdered, Flour, Emery-Grain, Fluorspar-Powdered, Lump, at mine, French Chalk, Fuller's Earth-Lump, Glauber's Salt, Glass-Ground, Gold-Chloride, pure, crystals, a. v., Chloride and sodium, Oxide, Gypsum-Calcined, Land Plaster, Iodine-Resublimed, Iridium-Oxide, Iron-Nitrate, Kaolin-See China Clay, Kieserite, Lead-Red, American, White, American, in oil, White, English, Acetate, or sugar of, white, Granulated, Nitrate, Lime Acetate-Am. Brown, Litharge-Powdered, English flake, Magnesite-Crude, Calcined, Brick, ton of 2,240 lbs., Manganese-Ore, per unit, Oxide, ground, Mercuric Chloride-Corrosive, Powdered, Marble Dust, Metallic Paint-Brown, 1st quality, Tea-In sheets according to size.

Table with columns: Mineral Wool-Ordinary slag, Ordinary rock, Ground, Naphtha-Black, Nitre Cake, Oxide-Rochelle, Washed Nat Ox'rd, Powder, Golden, Domestic, Oils, Mineral, Cylinder, light filtered, Dark filtered, Extra cold test, Dark steam refined, Phosphorus, Precip., red, white, Platine Chloride-Dry, Plumbago-Ceylon, American, Potassium-Cyanide, Bromide, domestic, Chlorate, English, Chlorate, powdered, English, Carbonate, lb., by casks, Caustic, lb., pure slick, Iodide, Nitrate, refined, Bichromate, Yellow Prussiate, Red Prussiate, Pumice Stone-Select lumps, Original cks., Powdered, pure, Pyrites-Non-oreous, p. units, Quartz-Ground, Kotten Stone, Powdered, Lump, Original cks., Rubbing stone, Sal Ammoniac-lump, in bbls., Salt-Liverpool, ground, Domestic, fine, Common, fine, Turk's Island, Salt Cake, Salt-peter-Crude, Soapstone-Ground, Block and slab according to size, Sodium-Prussiate, Phosphate, Stannate, Tungstic, Hyposulphite, Strontium-Nitrate, Sulphur-Roll, Flour, Sylvania, Talc-Ground French, American No. 1, American No. 2, Terra Alba-French, English, American, No. 1, American, No. 2.

Table with columns: Tin-Crystals, in kegs or bbls., feathered or flossed, Murate, single, Double or strong, 54° B., Oxymur, or nitro, Vermilion-Imp. English, Am. quicksilver, bulk, Am. quicksilver, bags, Chinese, Trieste, American, Zinc White-Am. Dry, Antwerp, Red Seal, Paris, Red Seal, Muriate solution, Sulphate crystals in bbls., feathered or flossed.

THE RARER METALS.

Table with columns: The prices given below are the prices in Germany, and are per gramme except where otherwise stated: Arsenic (metallic), per kilo, Barium (ex amalgam), (per electrol.), Bismuth (metallic), per kilo, Cadmium (metallic), Calcium (per electrol.), Cerium (pulv.), (fusum in globulis), Chromium (fus.), (cryst.), Cobalt (metallic), per kilo, (pure), per kilo, Didymium (pulv.), Erbium-Lithium (oxydat.), Gallium (cryst.), Germanium (fus.), (pulv.), Glucium (pulv.), (cryst.), Indium, Iridium (fusum), Lanthanum (pulv.), (per electrol.), Lithium (in glob.), (wire), Manganese (fusum), Molybdenum (pulv.), Niobium (pulv.), Palladium, Palladium (wire), Potassium (metal), per kilo, Rubidium, Rutherfordium, Selenium (cryst.), (precipitates), Strontium (per electrol.), (ex amalgam), Tantalum, Tellurium (fusum), (precipitates), Thallium, Titanium, Tungsten (pure), Uranium, Vanadium.

RAILROAD MATTERS.

Announcement is made of the retirement of W. M. Quarrier as purchasing agent of the Chesapeake, Ohio & Southwestern, and the appointment of Wm. P. McDowell to fill the vacancy.

The new Southern Railway Company has adopted the Westinghouse automatic air-brake and train signal and the M. C. B. coupler as the standards on all passenger trains, and hereafter all cars passing over the lines are expected to be equipped with these appliances.

The property, franchises, etc., of the Baltimore & Eastern Shore Railroad will be sold at Salisbury, Md., August 29. Robert D. Morrison is appointed special commissioner to make the sale. This road runs from Claiborne to Ocean City, Md., a distance of 87 miles, and is of special importance in controlling the trade of the Eastern Shore of Maryland and Virginia.

Mr. Robert A. Parke, who has had charge of the passenger business of the southeastern district of the Pennsylvania Railroad for the past 18 years, tendered his resignation on the 13th instant to take effect 1st of October next. This action on his part has been in contemplation for the past two months, his desire and intention being to enter another branch of service in the same corporation.

Mr. Daniel McLaren has been appointed general superintendent of the Montana Central Railroad. The Montana Central was formerly operated by a separate general superintendent, but latterly it has been included in the jurisdiction of the general superintendent of the Great Northern. Mr. McLaren was formerly general superintendent of the Mobile & Ohio Railroad. He resigned that position last March.

An appeal is to be made by the Louisville & Nashville from the recent decision of Chancellor Edwards, of Kentucky, which made permanent an injunction secured by the State of Kentucky to prevent the Louisville & Nashville assuming control of the Chesapeake, Ohio & Southwestern in accordance with an agreement made by that company and the Illinois Central for the purchase of the railroad stock.

It is reported that the Southern Railroad Company has been negotiating for the purchase of the lease of the Cincinnati Southern Railroad, now held by the Erlanger syndicate. The deal, if consummated, would be one of the utmost importance, as it would connect Cincinnati with a system embracing 7,000 miles of railway, and covering the entire Southern country excepting that occupied by the Louisville & Nashville road.

Through trains are now being run between Coatzacoalcos, on the Atlantic, and Salinas Cruz, on the Pacific coast, on the new Tehuantepec Railroad. Local business is already heavy and it is expected that the through traffic will increase rapidly. Edward Bodet, formerly traveling auditor and commercial agent of the Mexican National Railroad, has been appointed general freight agent of the Tehuantepec line. The general offices of the road will be located in Coatzacoalcos.

The Memphis & Charleston road is now being operated independently by receivers, as it was not included among the lines of the East Tennessee, Virginia & Georgia turned over to the Southern Railroad Company on August 1st. On August 1st the office of the general passenger and ticket agent was transferred to Memphis, Tenn. All communications concerning the passenger business should be addressed to B. W. Wrenn, general passenger and ticket agent at Memphis, Tenn.

The Georgia Pacific Railroad was bought on August 18th at Atlanta, Ga., by C. H. Coster, of the Drexel Morgan Company. There were only one bidder and one bid—\$500,000. The Georgia Pacific extends from Atlanta through Birmingham to Greenville, on the Mississippi river. Its mileage is about 690 miles. In common with the other Richmond Terminal lines the Georgia Pacific was thrown into a receiver's hands two years ago. Mr. Coster put up the \$500,000 guaranty as the auctioneer mounted a barrel at the freight depot, where the sale was conducted. No other deposit was made and the sale was quickly over.

The circular just issued from the president's office of the Florida Central & Peninsular Railroad

in New York announces that Louis Barkan, M. D., has been appointed immigration agent of that company, with office at No. 13 State street, New York. Appreciation of the advantages offered to immigrants by the country tributary to this company's lines in Florida, Georgia and South Carolina, and realization of the necessity of an increased population to create therein deserved prosperity, have prompted the experimental establishment of this agency. Dr. Barkan will direct the attention of immigrants to these States by making them and their resources better known.

The proposition of the syndicate headed by M. P. Kelly to construct a new east and west line in Texas has been accepted by the stockholders of the Georgetown & Granger and the Trinity, Cameron & Western railroads. The former has been consolidated with the latter. The line starts at Trinity and runs westward via Cameron and Granger to Georgetown. Work has already commenced on grading from Granger to Cameron. The grade from Georgetown to Granger, a distance of 15 miles, is finished, and this portion of the line is to be in operation January 1st, 1895. The line is to be finished from Georgetown to Cameron by January 1st, 1896, and to Trinity as soon thereafter as possible. It is expected that the road will be completed and in operation from Georgetown to Cameron by August, 1895. The route of this new east and west line is through central Texas, traversing in its western direction granite and marble quarries, and its eastern line penetrating the pineries of east Texas. The road crosses six north and south lines.

REDUCED RATES TO WASHINGTON, D. C.

Grand Encampment of the Knights of Pythias of the World.

The biennial encampment of the Supreme Lodge and grand encampment of the Knights of Pythias of the world will be held at the National Capital, August 27th to September 5th.

For this occasion the Baltimore & Ohio Railroad Co. will sell round trip tickets at reduced rates from all points on its lines east of the Ohio River, August 23d to 28th inclusive, valid for return trip until September 6th; a further extension of time to September 15th can be secured, provided the ticket is deposited with the joint agent at Washington, D. C., on or before September 6th.

The rate from Philadelphia will be \$4.00, Pittsburgh, \$8.00; Cumberland, \$4.55, and correspondingly low rates from all other stations.

THE MIDLAND RAILWAY OF KENTUCKY.

—THE SHORT LINE BETWEEN—
CINCINNATI AND FRANKFORT
—AND—
Frankfort, Georgetown and Paris.
C. D. BERCAW,
General Passenger Agent.

BRATTICE CLOTH, Imported,
From 12c. Yard upwards.
Rubber Belting, Hose, Packing, and all articles in Mechanical Rubber. Fluted Rubber Belting, on Fluid Tires, cannot slip.
Mineralized Rubber is better than Vulcanized
MINERALIZED RUBBER CO., 18 Cliff Street, New York.

THE BROWN PALACE HOTEL,
Denver, Colorado.

The only first class hotel in Denver. Absolutely fire-proof. (Artesian water and artificial ice) American plan. Rates, \$3 to \$5 per day, including steam heat.

PENNSYLVANIA DIAMOND DRILL & MAN'F'G CO.,

ESTABLISHED 1869. BIRDSBORO, BERKS CO., PA.
Has a larger experience than any other Company in the Boring of Prospecting Holes with the Diamond Drill. We make a Specialty of Prospecting Mineral Lands by taking out Cores, and of Boring Artesian Wells, Round and Straight.
W. F. Parrish Machinery Company, Western Sales Agents, Home Ins. Building, Chicago, Ill.

AMERICAN DEVELOPING
—AND—
MINING COMPANY,
— BUTTE, MONTANA. —

This company is engaged in the business of buying and selling, developing and operating mines. It is at the present time occupied in developing and equipping for production at an early date several groups of gold mines, situated in Idaho and Montana, of which it is the owner.

Thus prominently established in the mining regions, it has occasional opportunities for securing valuable mines at prices much lower than are possible under the usual methods of bringing such property to the attention of investors.

It has in its employ mining engineers whose reports it will guarantee, and desires to act as the Western agent of individuals or syndicates in the selection and purchase of mining property, doing the work on a commission. It will also advise on the operation of such, or other property of this class.

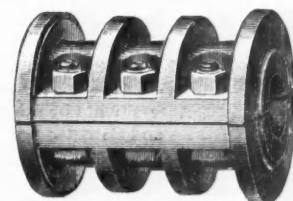
The company is in a position to properly guarantee any statement or report made by it, and solicits work of the character described, confident that with its exceptional facilities it can render valuable service to non-resident mine owners and investors.

It will furnish, upon proper application, evidences of its local reputation and of the character of its business transactions.

Correspondence Solicited. Moreing and Neal Code used. Cable address: "Adamco, Butte."

THE F. M. DAVIS
Iron Works Co.,

— DENVER, COLO. —



POWER TRANSMISSION MACHINERY.

Mining Machinery, Concentration and Reduction Machinery, Quarry Machinery, Smelting Furnaces, Engines, Pumps, Boilers, etc.

No. 2. — SEND FOR CATALOGUES.



SELDENS' PATENT PACKINGS,

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Sold by the supply houses in Denver, Butte, Helena, Chicago, St. Louis, Kansas City, Omaha, and on the Pacific Coast.

SOLE MANUFACTURER,
RANDELPH BRANDT, 38 Cortlandt St., N. Y.

The **Its Statistics,**
Mineral **Technology**
Industry: **and Trade**
IN THE UNITED STATES
AND OTHER COUNTRIES
From the Earliest Times to the Close of 1893.

VOL. II. ANNUAL.

This great volume of more than 1,000 octavo pages is the most important contribution to the statistics of the mineral industry of the world that has ever been published. This is the only work published in any language that gives the Statistics of the Mineral Industry of the World, and the only work that gives the Statistics of the United States for 1893.

It treats of abrasive materials; alum; aluminum; antimony; arsenic; asbestos; asphaltum; barytes; bauxite; bismuth; borax; bromine; cadmium; cements; the chemical industry, with the latest electrolytic and other processes applied in America and Europe; chrome iron ore and its products; clay and the clay industry; coal, with graphical tables of production, consumption per capita, production per man employed, costs, markets, coal mining machines and their work; copper production, consumption, markets, improvements in copper metallurgy, all the electrolytic refining processes, present practice in copper concentration and extraction throughout the world; copperas; cryolite; feldspar; fluorspar; gold and silver; graphite; gypsum; iron and steel; advances made in iron and steel metallurgy; open-hearth work at Steelton, Pa.; lead, distribution and production of lead in all countries; recent improvements in the treatment of argentiferous lead ores; limestones, marble and lime; lithographic limestone; magnesite; magnesium; manganese; marls; mica; nickel; onyx; ozokerite; peat; petroleum, its production, refining, markets, etc.; phosphate rock; phosphorus; precious stones; pyrites; quicksilver; the rare elements, their occurrence and production barium, boron, calcium, cesium, cerium, chromium, columbium, didymium, erbium, gallium, germanium, glucinum, indium, lanthanum, lithium, manganese, molybdenum, osmium, palladium, potassium, rhodium, rubidium, ruthenium, scandium, selenium, silicon, strontium, tantalum, tellurium, thallium, thorium, titanium, uranium, vanadium, ytterbium, yttrium, zirconium); salt, slate; sodium; sulphur; tale and soapstone; tin; tungsten; whetstones; scythe stones and grindstones; zinc.

Statistics of countries: Australasia, Austro-Hungary, Belgium, Canada, other British Colonies, Chili, France, Germany, Greece, Italy, Japan, Norway, Portugal, Russia, Spain, Sweden, Denmark, Egypt, Holland, Roumania, China, Switzerland, United Kingdom, United States.

Assessments by mining companies; dividends paid from 1884 to 1893; markets; mining schools in the United States and Canada; present practice in ore dressing; theories of the origin of ores; stone quarrying, etc.

Price \$5.00.

On orders from foreign countries excepting England, France and Germany, this book is sent by express at purchaser's expense.

THE SCIENTIFIC
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Publishers,
 Postal Telegraph Building, Main Office Room 817,
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ALPHABETICAL INDEX TO ADVERTISERS.

(-) Indicates every other week or monthly advertisements.

Table with 3 columns listing advertiser names and their corresponding page numbers, organized alphabetically from A to Z. Includes sub-sections for each letter and a 'Miscellaneous Wants' section.

WIRE ROPE MANUFACTURERS.

BRODERICK & BASCOM ROPE CO.
SOLE MANUFACTURERS OF



Established 1875. **“POWER” ROPE.** St. Louis, Mo.

THE MOST POWERFUL ROPE MADE.
SEND FOR ILLUSTRATED CATALOGUE

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CASCADE WATER WHEEL
EMBODYING IN PRINCIPLE THE HURDY-GURDY OR IMPULSE WHEEL
ADAPTED TO ALL HEADS FROM 30 FEET TO 2000 FEET.

Our experience of 33 Years in the water wheel business, enables us to suit every requirement of Water Power Plants. Send for Illustrated Pamphlet.

This New Wheel has given an Unequaled Economy in Water.

JAMES LEFFEL & CO.
SPRINGFIELD, OHIO, U. S. A., or New York City.



Perforated Metals
FOR ALL USES IN Mining and Ore Dressing.

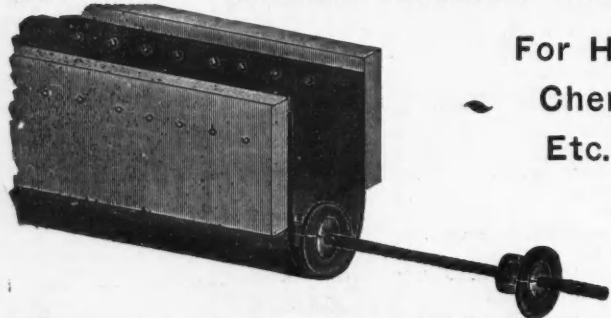
Machinery and Supplies Wanted.

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.

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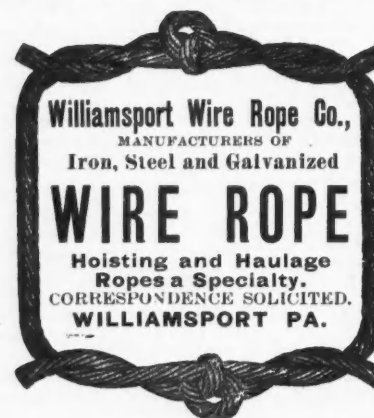


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Simple in Construction.

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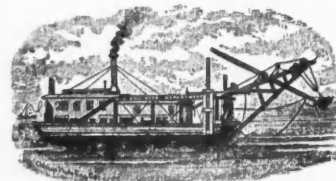


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Hoisting and Haulage Ropes a Specialty.
CORRESPONDENCE SOLICITED.
WILLIAMSPORT PA.

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Manufacturers of All Kinds of Mining Machinery.
The Freeman Steam Hoister a Specialty.
This Hoister never stalls on dead center. It is safe. It is strong. It is all iron and steel. Its levers are interchangeable from a right to a left-hand hoister. It has a large drum.

STEAM DREDGES FOR PLACER MINING.

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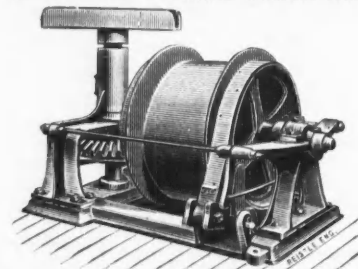


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CHICAGO, ILL.

A. GROETZINGER & SONS,
Sole Manufacturers of **DERMAGLUTINE.**
This improved process rawhide is adapted for pinions, gears, bushings and many mechanical uses where metal is now employed. It is the most perfect and durable material of its kind ever produced. For mining and hoisting machinery this material for gearing cannot be excelled. Write for prices and discounts; also catalogue.
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THE DAVIS SAFETY BRAKE HORSE HOISTER.



This Hoister is built entirely of iron and steel, and is provided with a patent Automatic Safety Bracket holding the load at any point, and making the working of the Hoister perfectly safe.

A Feature Not Possessed by Any Other Horse Hoist.

These Hoisters are built in five sizes. Capacity of machine No. 1, with one horse and single line, 800 pounds, 75 feet per minute. Price, complete with sheaves, \$100.

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THE F. M. DAVIS IRON WORKS CO., Denver, Colo.

Association of Engineering Societies.

The Journal for July contains an elaborate and handsomely illustrated paper on the **Hydro-Geology of the Upper Mississippi Valley.**
By **MR. DANIEL W. MEAD,** Member of the Western Society of Engineers.
Price, 30 Cents.
JOHN C. TRAUTWINE, Jr., Secretary,
419 Locust St., Philadelphia, Pa.

CLASSIFIED LIST OF ADVERTISERS.

Table with multiple columns listing various industrial companies and their products, including categories like Air Compressors and Rock Drills, Diamond Drills, and various machinery parts.

FREE ADVERTISING.

Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE, whether subscribers or not.

The labor and expense involved in ascertaining what positions are open, in gratuitously advertising them and in attending to the correspondence of applicants, are incurred in the interest and for the exclusive benefit of subscribers to the ENGINEERING AND MINING JOURNAL.

Applicants should inclose the necessary postage to insure the forwarding of their letters.

Positions Vacant.

1341 WANTED—CHEMIST TO GO TO Florida. Address, stating references, salary expected, etc., **GLOBE, ENGINEERING AND MINING JOURNAL.**

1342 WANTED—A YOUNG MAN TO assist in large general analytical laboratory. South; must be graduate of approved university and thoroughly grounded in analytical chemistry, especially agricultural chemistry; wide experience not necessary, and in fact prefer that experience be gained in this laboratory; salary moderate at start. Address, with references, age, etc., "SOUTHERN," ENGINEERING AND MINING JOURNAL.

1345 WANTED—CONCENTRATION MILL Foreman. A thoroughly competent man to take charge of a concentration mill in the State of Chiapas, Mexico, using rolls, jigs, stamps and Even's tables. Address giving full particulars as to experience, references and salary. "CHIAPAS," ENGINEERING AND MINING JOURNAL.

1346 WANTED—A FIRST-CLASS METAL- lurgist, capable of treating refractory gold and silver ores; also a good assayer and chemist. **RIVERSIDE, ENGINEERING AND MINING JOURNAL.**

1347 WANTED—SUPERINTENDENT for smelting and refining company. Must have a thoroughly practical knowledge of extracting and winning metals out of waste (skimmings and drosses) and of refining waste metals of all kinds and denominations. Should also have knowledge of chemistry. Address **DROSS, ENGINEERING AND MINING JOURNAL.**

1348 WANTED—A MAN TO TRAVEL and sell iron and steel buildings and general work. Must have pleasing address and thoroughly understand his business. Position permanent and to right man will pay a fair salary. State experience. **TRAVELER, ENGINEERING AND MINING JOURNAL.**

1349 WANTED—Competent concentrator constructor and foreman; mechanical engineer preferred, with experience. State experience, age, and wages expected. Address **ENERGY, ENGINEERING AND MINING JOURNAL.**

1350 WANTED—A COMPETENT SUR- veyor and draftsman. Must be a competent assayer and have a knowledge of washing coals. None but well recommended, sober and industrious men need apply. Address **STANDARD, ENGINEERING AND MINING JOURNAL.**

1351 A PROFESSOR OF MECHANICAL and electrical engineering, who is a good teacher and competent to direct the shopwork, is wanted at a college in the East. Address **NEW JERSEY, ENGINEERING AND MINING JOURNAL.**

1352 WORKING FOREMAN WANTED for factory, practically acquainted with the manufacture of non-conducting coverings (magnesia, felt, asbestos, etc.) for boilers, steam and water pipes. April cost should state age, experience, where last employed, salary required, and must have a good record. Address **MAGNESIA, ENGINEERING AND MINING JOURNAL.**

1353 WANTED—A MILL MAN THAT HAS had experience in treating low grade ores by concentration and the tailings by any of the successful modes now in use. Address **TAILINGS, ENGINEERING AND MINING JOURNAL.**

Situations Wanted.

Advertisements for **SITUATIONS WANTED** will be charged only 10 cents a line.

METALLURGIST AND CHEMIST OF eleven years' experience as assistant superintendent, superintendent and consulting metallurgist of lead refining, lead concentrating, pyritic smelting, copper smelting and copper refining works, will be at liberty shortly to take new position. Familiar with the latest metallurgical processes and improvements in the winning of metals from their ores, and the treatment of furnace and mill products. Terms reasonable. Address **SMELTING AND REFINING, ENGINEERING AND MINING JOURNAL.** No. 16,831, 1f.

MINING ENGINEER, 20 YEARS' EXPERI- ence in gold, silver, copper, lead and coal, is open to engagement. Address **INTEGRITY, ENGINEERING AND MINING JOURNAL.** No. 16,832, Sept. 25.

CIVIL ENGINEER WANTS POSITION with engineer or contractor; can make all calculations, supervise work, etc.; would accept small salary to commence; if there is chance for permanency; railroad, street, sewer, or building construction. Address **H. H., P. O. Box 1117, New York City.** No. 18860, Sept. 1.

METALLURGIST OF WIDE EXPERIENCE in the building and operation of concentrating works, lead and copper smelting works, copper converting works, silver refineries, etc., will be at liberty in a few months to make new engagement. Should like to correspond with any company requiring a superintendent either for the construction of new works or the operation of existing works. Terms very moderate. Address **CONSTRUCTION, ENGINEERING AND MINING JOURNAL.** No. 16,830, 1f.

MECHANICAL DRAUGHTSMAN, SEVEN years' experience, open for engagement. Address **NEW YORK, ENGINEERING AND MINING JOURNAL.** No. 16,817, Sept. 1.

EXPERIENCED CHEMIST, GRADUATE OF the Berlin University (Germany), at present employed in large works, reliable analyst, practiced in original and independent work, is open for engagement as assistant to superintendent, analyst, etc. Best of references. Address **A. N. A., ENGINEERING AND MINING JOURNAL.** No. 16,828, Sept. 1.

MINING ENGINEER REQUIRES A POSI- tion. Twenty years' experience in several countries in mining, milling, assaying and the treatment of refractory gold ores; no objection to go to Australia or Africa; good connection with the principal mining men and capitalists in London, England; will go there to represent any first-class firm in the States. Highest references and testimonials. Terms moderate. Address **PRACTICAL, ENGINEERING AND MINING JOURNAL.** No. 16,819, Sept. 1.

BY MIDDLE-AGED MARRIED MAN; HAS had years of experience as bookkeeper, special accountant and general office work in manufacturing business; well versed in details of foundry, machine shop and boiler shop work; excellent references. Address **"WELL VERSED," ENGINEERING AND MINING JOURNAL.** No. 16,825, Sept. 1.

MECHANICAL ENGINEER, FAMILIAR with design, construction and operation of mining machinery in coal and rock, seeks engagement with manufacturing or mining company. Address **FRANK CAWLEY, C. E., P. O. box 297, Montreal, Can.** No. 16,837, Sept. 1.

EXPERIENCED CHEMIST AND ASSAYER, with first-class references, desires a permanent position. Address **D. C. DONEY, Columbus, Ohio.** No. 16,809, Sept. 22.

A GRADUATE IN CHEMISTRY FROM THE University of Virginia, and post-graduate from the Ohio State University, desires position as chemist. Experienced in general analytical work, metallurgical and agricultural chemistry. Good references. Address **"A. W.," ENGINEERING AND MINING JOURNAL.** No. 16,842, Sept. 15.

GRADUATE MECHANICAL ENGINEER and draftsman, Jr. member American Society Mechanical Engineers, is open to engagement. Experience in rolling mill, mining and general machinery. References. Address **D. W. C., ENGINEERING AND MINING JOURNAL.** No. 16,841, Sept. 15.

MINING ENGINEER, NOW EMPLOYED IN Mexico, will go to Central America, preferably Honduras, with New York company as mining engineer or first assistant. Knows thoroughly language, customs and people of Spanish America. Address **HONDURAS, ENGINEERING AND MINING JOURNAL.** No. 16,746, e. o. w. Sept. 29.

Contracts Open.

TREASURY DEPARTMENT, OFFICE SUPER- vising Architect, Washington, D. C., August 21, 1894.—Sealed proposals will be received at this office until 2 o'clock P. M. on the 18th day of September, 1894, and opened immediately thereafter, for all the labor and materials required for the superstructure and roof covering, including approaches, of the United States Post Office and Custom House Building at Fargo, North Dakota, in accordance with the drawings and specification, copies of which may be had at this office, or at the office of the Superintendent at Fargo, North Dakota. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any and all bids and to waive any defect or informality in any bid, should it be deemed in the interest of the government to do so. All bids received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked, "Proposal for the Superstructure, Etc., of the United States Post Office and Custom House at Fargo, North Dakota," and addressed to **JEREMIAH O'ROURKE, Supervising Architect.**

TREASURY DEPARTMENT, OFFICE SUPER- vising Architect, Washington, D. C., August 25th, 1894.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 21st day of September, 1894, and opened immediately thereafter, for all the labor and materials required for the excavation, concrete foundations, cut stone and brickwork, iron and wood floor, ceiling and

roof construction, roof covering, drainage, etc., for the U. S. post-office building at Roanoke, Va., in accordance with drawings and specifications, copies of which may be had at this office, or at the office of the Superintendent at Roanoke, Va. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All bids received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked "Proposal for Excavation, Concrete Foundations, Cut Stone and Brickwork, Iron and Wood Floor, Ceiling and Roof Construction, Roof Covering, Drainage, Etc., for the U. S. Post Office Building at Roanoke, Va.," and addressed to **JEREMIAH O'ROURKE, Supervising Architect.**

TREASURY DEPARTMENT, OFFICE SUPER- vising Architect, Washington, D. C., August 24, 1894.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 17th day of September, 1894, and opened immediately thereafter, for all the labor and materials required for the brick and terra cotta floor arches, terra cotta column covering, wall furring, etc., for the U. S. court house, post-office, etc., building at Detroit, Mich., in accordance with the drawings and specifications, copies of which may be had at this office, or the office of the Superintendent at Detroit, Mich. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all proposals and to waive any defect or informality in any bid, should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked "Proposal for Brick and Terra Cotta Floor Arches, etc., for the U. S. Court House, Post-Office, etc., building at Detroit, Mich.," and addressed to **JEREMIAH O'ROURKE, Supervising Architect.**

WATER-WORKS.—Sealed bids will be received at the office of G. H. Niemeyer, Mayor, and H. C. Eckart, Recorder, of the Town of Guttenberg, Iowa, until September 18th, 1894, for furnishing all material and labor required in constructing a complete system of water-works in the Town of Guttenberg, Iowa. Plans and specifications will be on file in office of G. H. Niemeyer, Mayor. A certified check made payable to Treasurer of said town must accompany each bid. The Council reserves the right to reject any or all bids. **HENRY C. ECKART, Recorder.**

WATER-WORKS.—Sealed proposals will be received by the Board of Water Commissioners of the Village of Hamilton, until September 4th, 1894, for the construction of water-works. The works will consist in general of about seven miles of cast iron mains, with valves, hydrants, valve boxes and special castings, a life intake, pumping station, pumps, boilers, gravity fliers, water tower and other appurtenances. Bids will be received for certain separate portions of the work. Plans can be seen after August 31st, 1894, at the office of the Board of Water Commissioners at Hamilton, or at the office of the engineers, and specifications obtained from James M. Taylor, Secretary of the Board. Bids must be sealed and addressed to James M. Taylor, Secretary of the Board of Water Commissioners, Hamilton, N. Y., and marked on outside of envelope inclosing them, "Proposals for Water-Works." **WM. M. WEST, President; JAMES M. TAYLOR, Secretary; MELVIN TRIPP, Treasurer. THE STANWIX ENGINEERING COMPANY, Rome, N. Y., Engineers.**

WATER-WORKS.—Sealed bids will be received at the office of the City Clerk of DeKalb, Ill., until September 4th, 1894, for the improvement of the water-works system of said city. The following items will be required: Two high grade boilers; pumping plant for domestic service, including engine, deep well power pump and power service pump; one duplex pump for fire service of one million gallons daily capacity; one half million gallon reservoir; 60 tons of 10 and 12-in. cast iron pipe with special castings; pipelaying, including removal of old pipe. Bids on boilers and machinery will be accepted from manufacturers only. Plans and specifications can be seen, and specifications for boilers, machinery and cast iron pipe, and also general form of contract and proposal, can be obtained at the office of the undersigned. **DANIEL W. MEAD, Consulting Engineer Rockford, Ill.; E. A. PORTER, City Clerk, DeKalb, Ill.**

INTAKE PIER.—Sealed proposals for building and placing intake pier in the Niagara River will be received by the Secretary of the Board of Water Commissioners of the Village of Tonawanda, Erie County, N. Y., at their office, room 11 Post-office Building, until September 7th, 1894. Plans and specifications may be seen by applying at the said office, or to **J. B. SNOW, Village Engineer.**

Continued on page 19.

CHLORINE LIQUID

For Extraction of Gold.

FOR SALE BY

WM. PICKHARDT & KUTTROFF,

98 LIBERTY STREET, NEW YORK.

The Most Successful Process for the Extraction of Gold.

IMPROVED BARREL CHLORINATION.

The undersigned has completed drawings and plans of the latest improvements in Barrel Chlorination, and is open to engagement for the testing of ores, the erection and operation of plants of any capacity. The most successful works in this country were managed by the undersigned.

Correspondence solicited.

JOHN E. ROTHWELL,
ENGINEERING AND MINING JOURNAL, New York.

MACHINERY AND SUPPLIES FOR SALE.

RAILS FOR SALE.

These Selected Second-hand T Rails in good condition to lay:
6½-lb. Steel, Western Penna. or Eastern Ohio delivery, 20-lb. Northern
If you can use any of the above, or any second-hand 30-lb. Iron Rails for Penna. delivery, write us. We sell new Steel Rails.

ROBINSON & ORR,
No. 419 Wood St., Pittsburgh, Pa.

DOUBLE CORLISS CONDENSING ENGINE,
60 H. P.; one 1½-in. by 42-in Corliss engine, 125 H. P.; double automatic engine, 350 H. P.; two 100-H. P. Phoenix automatic compound engines, 45 and 5 H. P.; Westinghouse engine, one 80 H. P. Beck engine, one 7 x 7 Southwark automatic engine, one 4-H. P. Otto gas engine, 10, 20, 300 and 500-H. P. feed-water heaters, 30 to 100 H. P. return tubulars, 70-H. P. Locomotives, 6½-H. P. vertical boilers, good for 100 pounds. **FRANK TOMMEY,** Office 131 N. 3d St., Philadelphia, Pa. Warehouses, 974 to 990 Beach Street, 159 to 161 Canal Street.

FOR SALE.

A New Steam Dredge,

Built by Marion Steam Shovel Company; capacity of dipper, one cubic yard; daily capacity of dredge, 600 to 900 cubic yards per 10 hours. Also 5½-ton Locomotive and 15 side dump cars of two cubic yards capacity, 36-in. gauge; together with about 5,000 ft. 16-lb. iron rail.

The above machinery is new (locomotive and cars built by Ryan, McDonald & Co., of Baltimore, Md.), and is now in Florida, where it will be sold cheap for cash or approved paper.

Address **L., P. O. Box 542**
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A GRADUATE OF LEHIGH UNIVERSITY wants position as assistant in a chemical, metallurgical or assaying laboratory, or as instructor of chemistry, metallurgy, assaying or physics in a college or industrial school. Willing to accept small salary for a beginning. Best of references furnished. Address **CHEMIST, ENGINEERING AND MINING JOURNAL.** No. 16,856, sept. 15.

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G. A. R. Annual Encampment.

LOW RATES TO PITTSBURG.

Interest in the annual reunions of the Grand Army of the Republic and Naval Veterans Association grows with each succeeding year, not only among the veterans themselves, but among all patriotic citizens of the republic.

The encampment this year at Pittsburgh, from present indications, promises to be as interesting and enthusiastic as any reunion since the war. Thousands of veterans from all parts of the country will be present, and Pittsburgh will surpass herself in showing them her hospitality.

The Baltimore & Ohio Railroad Co. will sell excursion tickets from all ticket stations on its line east of the Ohio River, for all trains September 6th to 10th, valid for return passage on all trains until September 25th, inclusive, at one fare for the round trip.

For more detailed information write to **C. P. CRAIG,** General Eastern Passenger Agent, B. & O. R. R., New York, N. Y.

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NOTICE OF ASSESSMENT.

(Civil Code of California.)

Silver King Mining Company. Location of principal place of business, San Francisco, California. Location of works, Pioneer Mining District, Final County, Arizona Territory.

Notice is hereby given that at a meeting of the Board of Directors held on the 31st day of July, 1894, an assessment, No. 11, of Thirty (30) Cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, No. 310 Pine St., Rooms 15 and 17, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 11th day of September, 1894, will be delinquent and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 2d day of October, 1894, to pay the delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors, **J. W. PEW,** Secretary. Office No. 310 Pine Street, Rooms 15 and 17, San Francisco, California.

ASSESSMENT NOTICE.

Brunswick Consolidated Gold Mining Co.

Location of Principal Place of Business, **SAN FRANCISCO, CALIFORNIA.**
Location of Works: **GRASS VALLEY MINING DISTRICT**
NEVADA COUNTY, CAL.

Notice is hereby given that at a meeting of the Board of Directors held the twenty-second day of August, 1894, an assessment (No. 7) of two cents (2c.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 56, Nevada Block, San Francisco, California, or to the Treasurer, **J. J. Halpin,** No. 57 Broadway (Room 8), New York City, State of New York, on or before the eighteenth day of September, 1894.

Any stock upon which this assessment shall remain unpaid in San Francisco on the twenty-fifth day of September, 1894, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the eleventh day of October, 1894, to pay the delinquent assessment together with costs of advertising and expenses of sale.

By order of the Board of Directors,
J. STADTFELD, JR., Secretary.
P. S.—All certificates of stock must be sent to the Treasurer to be stamped Assessment Paid.

DIVIDENDS.

RICO-ASPEN CONSOLIDATED MINING COMPANY.

DENVER, Colo., September 1st, 1894.
DIVIDEND NO. 11.

If the regular monthly dividend of twenty-five thousand (\$25,000) dollars, being two and one-half (2½) cents per share, has been declared for August, payable on September 10th. Transfer books close September 5th and reopen September 11th.

A. B. ROZDER, Secretary.

Contracts Open.

Continued from page 18.

CONDUITS.—Treasury Department, Office of the Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 6th day of September, 1894, and opened immediately thereafter, for all the labor and materials required to put in place complete all the plumbing, gas piping and electric wire conduits for the U. S. post office, court house, etc., building at Charleston, South Carolina, in accordance with the drawings and specification, copies of which may be had at this office or the office of the superintendent at Charleston, S. C. Each bid must be accompanied by a certified check for a sum not less than 2 per cent. of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, should it be deemed in the interest of the Government to do so. All bids received after the time stated for opening will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the Plumbing, Gas Piping, Electric Wire (Conduits, Etc., for the U. S. Post Office, Court House, Etc., Building at Charleston, S. C.," and addressed to **JEREMIAH O'ROURKE,** Supervising Architect.

OFFICE OF THE LIGHTHOUSE ENGINEER, Seventh District, New Orleans, La.—Sealed proposals will be received at this office until the 11th day of September, 1894, for furnishing materials and labor of all kinds necessary for the completion and delivery of the metal work for the Crooked River Light Station, Florida. Plans, specifications, forms of proposal and other information may be obtained on application to this office. **JAMES B. QUINN,** Major of Engineers U. S. Army, Lighthouse Engineer, Seventh District.

IRON AND COPPER WORK.—Treasury Department, Office Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 7th day of September, 1894, and opened immediately thereafter for all the labor and materials required for the iron stairs, interior iron and copper work, etc., for the U. S. custom house and post office at Newark, N. J., in accordance with the drawings and specification, copies of which may be had on application at this office or the office of the superintendent at Newark, N. J. Each bid must be accompanied by a certified check for a sum not less than two per cent. of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the Iron Stairs, Interior Iron and Copper Work, Etc., for the U. S. Custom House and Post Office at Newark, N. J.," and addressed to **JEREMIAH O'ROURKE,** Supervising Architect.

SEWERS.—Sealed proposals will be received until September 5th, 1894, by the Common Council of the city of Plainfield, N. J., at the Council Chamber No. 109 Park avenue, in the city of Plainfield, for doing the work and furnishing the materials in the construction of such portion of the sewer as provided for in the plans and specifications now on file in the office of the City Clerk, No. 109 Park avenue, Plainfield, N. J. Each proposal must be accompanied by a certified check for \$1,000, payable to the Treasurer of the city of Plainfield. The Engineer's estimate of the quantities of material required, and the work to be done, is approximately as follows: 10 feet 2½-inch pipe sewer, 3,780 feet; 18-inch pipe sewer, 6,130 feet; 15-inch pipe sewer, 6,570 feet; 12-inch pipe sewer, 1,095 feet; 10-inch pipe sewer, 9,910 feet; 8-inch pipe sewer, 969 Y-branches, 67 manholes, 26 drop connections at manholes, 25 lampholes, 2 150-gall. flush tanks, 1 1,000-gall. flush tank, 300 extension connections on Y-branches, 5,000 feet tile underdrains. Duplicate plans may be examined, and forms of proposals, specifications, contract, bond, etc., may be obtained at the office of the Engineer, No. 109 Park avenue, Plainfield, N. J. All proposals must be indorsed "Proposals for Sewers." **JAMES T. MACMURRAY,** City Clerk.

WATER-WORKS.—Sealed proposals for the construction of a system of water-works for the village of Quincy, Mich., will be received up to September 5th, 1894, at the office of the president of said village, for furnishing material and labor, viz.: 1,566 ft. 10-in. cast iron pipe; 2,580 ft. 8-in. cast iron pipe; 7,071 ft. 6-in. cast iron pipe; 13,907 ft. 4-in. cast iron pipe; 42 double nozzle hydrants; 35 gates and boxes; 2 60-in. x 14 ft. boilers; 2 16 in. x 8½ in. x 10 in. non-compound duplex pumps; 1 building and stack; 6 6-in. wells. Each proposal must be accompanied by a certified check of \$500. **DAVID W. YOUNG,** President; **J. B. VANNASDALE,** Clerk; **W. S. PARKER,** Consulting Engineer, Pontiac, Mich.

WATER-WORKS.—Sealed proposals to build water-works in the city of Greenville, Miss., will be received by the Clerk until October 2d, 1894. Upon the franchise system. Specifications on file with the City Clerk.

OFFICE OF THE LIGHTHOUSE ENGINEER, Seventh District, New Orleans, La.—Sealed proposals will be received at this office until the 11th day of September, 1894, for furnishing materials and labor of all kinds necessary for the completion and delivery of the metal work for the Crooked River Light Station, Florida. Plans, specifications, forms of proposal and other information may be obtained on application to this office. The right is reserved to reject any or all bids and to waive any defects. **JAMES B. QUINN,** Major of Engineers, U. S. Army, Lighthouse Engineer, Seventh District.

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