

THE ENGINEERING AND MINING JOURNAL



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

VOL. LIV. AUG. 13. No. 7.

RICHARD P. ROTHWELL O.E., M.E., Editor.
ROSSITER W. RAYMOND, Ph.D., M.E. Special Contributor.
SOPHIA BRAEUNLICH, Business Manager.
THE SCIENTIFIC PUBLISHING CO., Publishers.

SUBSCRIPTION PRICE:

Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada, \$4 per annum; \$2.25 for six months; all other countries in the Postal Union, \$7.

Monthly Export Edition, all countries, \$2.50 gold value per annum. REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

THE SCIENTIFIC PUBLISHING COMPANY.

OFFICERS: R. P. ROTHWELL, Pres. & Gen'l Mang. / P.O. Box 1833.
 SOPHIA BRAEUNLICH, Sec'y & Treas. / 27 Park Place, New York.
 Cable Address: "Rothwell, New York." Use A. B. C. Code, Fourth Edition

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THE recent adoption of a new mining law in Spain, which increases the annual rental on all mines, as the title there is vested in the Crown, would seem unwise, as it will probably force to the wall many of the smaller companies, which are even now unprofitable. The policy of the Government has heretofore been fostering and liberal. It seems the more remarkable, therefore, that with decreased exports of iron ore from Balbao and Cartagena, decreased profits of many copper mines, and a poor outlook for the lead properties, that fixed charges should have been increased.

THE most thorough series of articles that has ever been written on American engineering schools is now being published in *Engineering News*. Statistics showing the number of graduates from each school each year since its organization are given in a recent issue. They show an extraordinary increase during the past five years in the number of schools and the number of graduates. We are glad to learn that these articles are to be republished in book form. In this connection it is gratifying to find in *Engineering*, of London, such a commendation as the following, which appears editorially in its issue of July 15th: "It is a well known fact that students from the American technical schools find it much easier to get employment than do those in a similar position in this country. In fact, American manufacturers are glad to get them, while here employers almost make a favor of taking them at a salary of 'nothing and find themselves.' Such a condition of things is a flattering tribute to the excellence of the course of training pursued at the American technical schools." And to the lack of prejudiced conservatism in this country, it might be added.

THE Imperial German telegraph lines are constantly improving, both in the completeness of the system and the methods used. During the past three years the lines were extended over 12 per cent. while the wires were increased 15 per cent. in length, making a total of 15,639 kilometres of line and 95,217 kilometres of wire. The most radical departures from existing American practice has not been in the invention or adoption of improved electrical apparatus, but in the improvement of the lines themselves.

Experiments having proved that copper bronze wires were better conductors of electricity and the delicate variations of current in telephonic work, a direct line constructed with wires of this alloy has been built from Berlin to Rome, and messages are transmitted this distance of 1,935 kilometres without a relay. Pleased by the excellent results of this experiment the government intend replacing all the iron and steel wires in its system by bronze wires. This, of course, will require the consumption of a considerable quantity of copper, although the expense will not be as great as it would at first seem, for the wires used are not over three millimeters in diameter and weigh about 61.25 kilogrammes per kilometre or a total of 5,832 metric tons of wire. Where wooden posts cannot be used, as on viaducts and bridges, iron poles manufactured by the Mannesmann process are to be used.

THE names of the five commissioners who are to represent the United States at the coming International Silver Conference have been officially announced. They are: Senator W. B. ALLISON, of Iowa; Senator J. P. JONES, of Nevada; Congressman JAMES B. McCREARY, of Kentucky; ex-Comptroller HENRY B. CANNON of New York, and Gen. FRANCIS WALKER, of Massachusetts. With one exception these are good men, of high standing and earnest purpose, and they will lend dignity to the proceedings. Senator ALLISON has had 28 years of Congressional experience, of which 20 has been in the Senate. He is chairman of the Committee on Appropriations, and a leading member of the Committee on Finance. He voted against STEWART'S Free Coinage Bill in July.

Congressman McCREARY is chairman of the Committee of Foreign Affairs and was the introducer of the bill providing for the present conference. He is in favor of free silver.

Mr. CANNON, who succeeded Mr. KNOX as Comptroller of the Treasury, is now president of the Chase National Bank of New York. Mr. CANNON is opposed to free silver.

General WALKER is well known as a statistician and earnest student on economic questions. He was a member of the Monetary Conference held at Paris in 1878.

It is greatly to be regretted that, apparently, the exigencies of politics should have induced the President to insult both this nation and those whom he had invited to join in this conference by appointing, as one of our commissioners, Senator JONES, the head of the infamous Comstock mill ring, and president of the Nevada Mill and Mining Company. Judge Hebbard of the Superior Court of San Francisco in his recent decision said there were strong suspicions that this corporation "was conceived in fraud." Senator JONES escaped the conviction, which fell upon his partners and associates, only by keeping out of the jurisdiction of the Court. To send as our representative a man proved to be guilty of fraud and of swindling the stockholders of the Comstock mines is a shame from which President Harrison should have spared this country. The effect of such an appointment will be to very seriously impair our influence and endanger the cause which we seek to promote.

THE SO-CALLED MacARTHUR-FORREST PROCESS.

The statement we have made that this process has narrow limits of application, probably working well only on ores where the gold is in an extremely fine condition or where there is considerable percentage of silver combined with the gold, is being constantly proved by actual results in this country; one of the latest failures being that of the 100-ton plant at the Needles, San Bernardino County, California. This mill, which has often been referred to by the cyanide people as to be shortly in successful operation, being the largest yet erected in this country, has closed down after an unsuccessful run, and it is now in order after this expensive experience to erect another type of reduction works. Unsuccessful results are recorded in Idaho, and no doubt we shall hear of similar failures on the ores of the Bald Mountain district, South Dakota. These latter ores were tested thoroughly by the late E. N. RIOTTE, with a modification of the prior Simpson patent, in which he was interested, but he had to confess a failure, although a large pecuniary reward awaited the successful experimenter.

The companies erecting these plants are frequently deceived by excellent laboratory results, which can be obtained by many lixiviation processes. The many difficulties of actual practice are overlooked, and when, for economical reasons it becomes necessary to work with dilute solutions, the percentage extracted is disappointing. Then, again, mechanical difficulties in leaching occur which increase the working cost enormously. Experience is teaching mining engineers that unless the ore is singularly well adapted to this process—such cases do occur—a failure will certainly be made.

Notwithstanding the loss by many companies adopting the process, the Cassel Gold Extracting Company, owning the MacArthur-Forrest patents, is reaping a rich harvest, and is in a fair way to recoup the losses it suffered through the notorious Cassel process and its inventor. The profit is made mainly from the formation of minor companies purchasing territorial rights. The profits of this company for the past year, as announced by the chairman at the annual meeting held July 26th in Glasgow, revealed the enormous sum of £175,387, or, roughly, \$875,000. And yet it is certain, we believe, that the patents are not valid. It should be borne in mind by those negotiating for it that a licensee is estopped from questioning the validity of a patent.

LABOR AND LIBERTY.

The most surprising spectacle of our time is the manner in which "organized labor," in its war upon free labor, is sustained by the interests and fears of politicians and the mistaken sympathy of philanthropists and theoretic reformers. It is a strange alliance of the corrupt, the cowardly, the Christian and the crank to assist, consciously or unconsciously, the operations of a tyranny which would be merely ridiculous if it were not made terrible by such support. The principles of liberty, which were supposed to have been established beyond question at the cost of centuries of conflict, are meekly sacrificed at the behest of a turbulent party, claiming unlimited privileges and repudiating all obligations.

Perhaps the saddest part of this amazing submission to mere audacity is furnished by the legislation of Congress. A specimen of this is the "contract labor" law, according to which no immigrant can be admitted into the United States, if he has made sure beforehand, by securing the promise of employment, that he will not become a pauper after his arrival. And a disgraceful comment upon it has just been furnished by the Secretary of the Treasury, in his correspondence with Mr. GOMPERS, President of the American Federation of Labor. The Amalgamated Association having got into a foolish fight with the Carnegie Company, the consequence, as might have been foreseen, was the publication throughout the world of the high wages offered at the Homestead works, and rejected by that Association. Those who enjoy a good thing like that are usually shrewd enough to keep quiet about it. But these men caused the description of their *bonanza* to be telegraphed abroad. Whereupon Mr. GOMPERS, the head of another labor organization, informs the Secretary of the Treasury that iron and steel workers appear to be coming to this country in unusual number, and that this is no doubt due to the lax enforcement of the contract labor law, and suggests that he should detail men to enforce that law more efficiently. And the Secretary replies that the suggestion strikes him favorably! This is "politics," no doubt; but even politics might have justified a better course. The public mind is in a condition to welcome a ringing, manly, indignant rebuke, administered in the name of liberty and law and real labor, to the arrogance of so-called "labor;" and Secretary FOSTER lost an opportunity when he failed to speak it.

Both parties in Congress appear to be equally in haste to bow before the same fancied power. The provision incorporated in an Appropriation bill, forbidding the employment by any government officer of men furnished by the Pinkerton or any other similar detective agency, deserves to be separately discussed, as a text to the inquiry, What is the true character and work of the Pinkertons? I pass it by at this time. The law, in itself, is not likely to make any change in the public service.

The government has its own detectives and watchmen, with soldiers to back them; and it is not likely that government officials have employed private agencies in these lines. The prohibition is consequently a gratuitous and empty exhibition of the cringing of one set of demagogues before another set—nothing more.

The same cannot be said of the act of August 1st, 1892, which reads as follows:

SEC. 1. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That the service and employment of all laborers and mechanics who are now or may hereafter be employed by the Government of the United States, by the District of Columbia, or by any contractor or subcontractor upon any of the public works of the United States, or of the said District of Columbia, is hereby limited and restricted to eight hours in any one calendar day, and it shall be unlawful for any officer of the United States Government, or of the District of Columbia, or any such contractor or subcontractor whose duty it shall be to employ, direct, control the services of such laborers or mechanics, to require or permit any such laborer or mechanic to work more than eight hours in any calendar day, except in case of extraordinary emergency.

SEC. 2. That any officer or agent of the government of the United States, or of the District of Columbia, or any contractor or subcontractor whose duty it shall be to employ, direct or control any laborer or mechanic employed upon any of the public works of the United States, or of the District of Columbia, who shall intentionally violate any provision of this act, shall be deemed guilty of a misdemeanor, and for each and every such offense shall, upon conviction, be punished by a fine not to exceed one thousand dollars, or by imprisonment for not more than six months, or by both such fine and imprisonment, in the discretion of the court having jurisdiction thereof.

It will be observed that this law in its sweeping provisions, leaves no loophole, except that of "extraordinary emergency," for exceptions or modifications. Men may desire to work overtime, for extra pay; the nature and circumstances of the work may make nine, ten, or even twelve-hour shifts advantageous and not unreasonable. But whatever be the desire of the laborers or the conditions of the work (so long as they are its ordinary conditions), no distinction can be permitted. And this interference with liberty in the name of labor has been dictated by men who concede to the great mass of free laborers no rights at all, and who are audaciously making the government a tool of their own tyranny.

The result of this enactment will be to add many millions of dollars to the cost of public works, already enormous. In a single instance, the officers in charge of extensive works, now in progress, estimates that their cost will be increased by more than a million dollars.

Is there to be any end to this truckling before an irresponsible power, which needs only to be courageously defied in order to reveal the hollowness of its claims, even to be feared? And if there is to be an end, might it not well come now?

All this does not in the least impugn the right of workmen to organize, or deny the benefits which labor organizations have heretofore conferred upon society. Corporations are good things; railroads are good things; yet nobody hesitates to hold them subject to law, and makes them respect the rights of men. The truth is that labor organizations, however useful and praiseworthy, may be so abused as to plan and attempt great wrong. When they do that, they are bad; and no twaddle about their previous goodness is a pertinent reply to the indictment that justice brings against them. What is needed is the firm subjection to law of the operations of these trusts and monopolies, as of any others. And in the conflict which many of these organizations have inaugurated, between the organized minority and the unorganized majority of the workingmen of the country, the sympathies of free men and the protection of the government should not be given to the oppressors of labor, the foes of liberty and the violators of law.

R. W. R.

BOOKS RECEIVED.

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

Annuaire pour 1892 de la Société D'encouragement pour L'industrie Nationale. Includes Constitution, By-laws, Lists of Members and Prizes offered by the Society. Paris, Camerot et Renouard, pages 152.

Annual Report of the Department of Mines and Agriculture of New South Wales for 1891. Charles Potter, Government Printer, Sydney, New South Wales. Pages 284, with maps and plates. Price 5 shillings.

Annual Report of the Secretary of Mines of Victoria, Including Reports of the Workings of Part III. of Mines Act of 1890, etc., etc. A. W. Howitt, Secretary. R. S. Brain, Government Printer, Melbourne. Pages 137, with maps and plates. Price 5 shillings.

A Statistical Account of the Seven Colonies of Australia, by T. A. Coghlan, Government Statistician of New South Wales. With maps and diagrams. Published by Charles Potter, Government Printer, Sydney, New South Wales. 1892. 406 pages.

Poor's Manual of Railroads, 1892. 25th Annual Number. Published by H. V. & H. W. Poor, New York.

The Wealth and Progress of New South Wales, 1890-91, by T. A. Coghlan, A. M., Inst. C. E., Government Statistician. Fifth issue. Published by George Stephen Chapman, Acting Government Printer, Sydney, New South Wales. 1891. 897 pages.

The Niagara Falls Tunnel.—Chief Engineer Porter says that the big power tunnel will be completed before October 1st and that it is probable water will belet into it by that date. The other work is progressing rapidly. On Saturday, August 20th, a meeting of the officers and engineers of the Cataract Construction Company will be held in this city. Prof. Forbes and Prof. Unwin, of London, England, will be present. The particular business to be considered is the development of power on the Canadian side and the transmission of power to Buffalo.

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.

King's Mountain, N. C., Gold Mine.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I have read the remarks over the letters J. L., in reference to the ores of the King's Mountain, N. C., Gold Mine, as contained in the issue of your journal of July 23. The estimate of \$8 per ton value, placed on the ore in sight, is a correct one in my opinion. I have visited the mine in question several times, and have repeatedly examined and analyzed the ores from the same, entirely for and on my own account, and found them of the quality claimed, but add that a fair and conservative average would be \$8 per ton.

If the mine workings had been carried on in a more careful and particular manner, utilizing what has been ignored in the workings, the mine would have paid largely and continuously until the present time. My opinion is that it is a good property, and, properly handled, can be worked profitably.

The ore of lead found in combination with the ores of this mine contains considerably more arsenic than "tellurium."

HARRISBURG, VA., AUG. 1.

MINING ENGINEER.

The Factor of Local Conditions.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: "The Factor of Local Conditions in Mining Operations," as given in your issue of 16th inst., is in substance a fact beyond dispute, but with one of your cited examples I take exception.

A year ago or more, during my absence, some small pan tests were made here of ore from the leading mine of Zacatecas (El Bote) with very satisfactory results, whereupon the company sent some on to a well known sampling works in the United States for corroboration of the tests made here. But these works obtained, as I understand, only about 60% of the gold and silver, and advised in their report the continuance of the patio treatment. Stimulated by this report, I last winter made a special journey to Chicago and there, in the presence of three representatives of the company, made some small preliminary tests which were satisfactory in results. From this it was decided to make some tests upon a working scale in a "continuous mill," and accordingly 130 tons were sent here, which we have recently worked in the presence of the manager. A clean-up was made before and after the test, and we had bullion for nearly 84% of their own sample and assay of both gold and silver.

While this is not 90 per cent., as an item in your issue of 9th inst. gave the patio credit of working the Zacatecas to, it was better than their average extraction of gold and silver, and the treatment will be less with the mill.

The patio is very efficient in treating sulphide ores, but it will not treat zinc or galena ores. With some sulphide ores it is very difficult for ordinary pan amalgamation to equal it, yet the patio is liable to have to go.

M. P. BOSS.

PACHUCA, July 23, 1892.

[The ores of the El Bote mine differ from those of the majority of mines in Zacatecas inasmuch as they carry a *ley* of gold. This of course requires a longer grinding and amalgamating in the arrastra, and at best the percentage of gold extracted is low. The ores of the San Rafael mine, until recently the most productive one in the district, consisting of argenteriferous zinc blende, galena and pyrite disseminated in a quartz gangue, were worked in the Hacienda Begonia to 90%, with a cost, including the quicksilver *consumido* and *perdido*, of less than \$7 Mexican silver per ton, which results were much higher in extraction and lower in costs than those obtained in a 15-stamp mill erected some years previous. The ores of El Bote are not typical of Zacatecas, while those of the San Rafael are. As a consequence, the factor of local conditions plays no part in the one case, while it does in the other.—ED. E. & M. J.]

The Algoma Nickel Mines.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The progress of mining in this district for the past two years has not come up to our expectations by any means, and mainly owing to two causes: In the first place, the old government regulations for the sale of mineral lands in Ontario allowed a lot of speculators to buy up a great part of the nickel range without requiring any development work to be done on their claims. Then the new mining law which came into force some eighteen months ago, by foolishly imposing a royalty on all new properties taken up, has had the effect of deterring capitalists from going into mines here.

But all the old mines, with one exception, are being worked as before, and some of them on a larger scale. The Canadian Copper Co. (of Cleveland, Ohio), work three locations, the Copper-cliff, Stobie and Evans mines, and get out and treat over 300 tons of ore every day. They have lately added the Bessemer process to their smelting furnaces, by which they are enabled to turn out much richer matte, that carries upward of 80 per cent. of copper-nickel. The Murray mine, belonging to the well known Vivians of Swansea, Wales, also makes similar matte by the same process. The mines of the Dominion Mineral Co. were closed down for some unknown reason last fall, but the largest one of them has been started again under new and more vigorous management, and now employs about 250 hands. In the township of Drury, on the other or southwest end of the range, the Chicago Nickel Co. are exploiting the Traverse mine and have their smelting works nearly completed. This will make altogether five smelting furnaces in the district, with a united capacity for treating over 700 tons of ore a day. Besides, a number of other properties are being opened up this season, and there are good prospects of increased activity and interest in mining here before long.

The main nickel range is about fifty miles long and from one to four miles wide, running in a northeast and southwest direction from Lake Wahnapitac to the Spanish River. But, strangely enough, the best part, or great middle section of it, has not been touched yet, excepting a little development work done here and there on it. Most of the ore-beds of the district occur on this belt in the narrow tongues of diorite, culminating near the middle of the range or in the township of Denison into veritable

mountains of mineral. I have seen the principal mining camps of North America, but I do not know of any other six miles square that has so many and such vast deposits of ore in it as this township of Denison. There are other remarkable features about this township. For instance, on the north side of it, a chain of eleven immense ore beds run across it almost in a straight line, and all rising into great hills and ridges above the surface. One of them, known as "Lot 8," is considered one of the best nickel properties on the range. Then immediately south of this belt there is a smaller hill on the Vermillion mine that yields no less than six different minerals, namely, platinum, nickel, copper, gold and silver, and more or less tin. The nickel ore in this mine is of very high grade, or from 10 to 40 per cent., and some three miles to the southwest of it, gersdorffite carrying 60 per cent. of nickel has been found, though not in very large quantities. Lastly, on the south side of the township a secondary mineral belt occurs, with a number of promising nickel beds on it, as well as some platinum, gold and silver.

A few of these fine properties have been bought up by the Canadian Copper Company and others, but the most of them are still in the market. They were fortunately all patented under the old law, and are therefore free from royalty or conditions of any kind.

A. MCCHEARIE.

SUDBURY, Aug. 4, 1892.

The Crawford Crushing and Amalgamating Mill.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of July 23d there is an article descriptive of the Crawford mill, and a tabulated statement which purports to show the results of work done by this mill compared with that done by stamps. So far as the figures relating to the "Waverley Mine, Nova Scotia," are concerned, permit me to say that they are purely fictitious. The Crawford mill has never crushed any quartz from the Waverley mines.

The few tests made by the machine in Nova Scotia, on tailings and on quartz from Montaga district, have clearly shown that the extravagant merits claimed for this machine cannot be substantiated by actual work.

JOHN E. HARDMAN, Managing Director,
The West Waverley Gold Company, Limited.

WAVERLEY, Nova Scotia, August 2d, 1892.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Permit me the privilege of replying to two letters in your issue of the 30th ult., relating to the Crawford Gold Extractor.

With regard to the communication from Mr. Robinson, of the Montana Company, Limited, I desire to state we did not furnish your journal with the item he questions, nor have we ever claimed to have operated our mill at his mine. That the Crawford Mill has, however, favorably impressed neighboring mine owners, is evident from the following letter, selected from several of similar tenor:

HELENA, July 12, 1892.

GENTLEMEN: After the very satisfactory test under my personal observation of the Crawford Gold Mill, on 10 tons of ore from the Mac Mine, I unhesitatingly say that I think it just the mill wanted by gold mining men, and at the next meeting of the directors of the Mac Mining & Milling Company I shall strongly advocate the purchase of four or more of your mills to replace the 20 stamps recently destroyed by fire.

Respectfully,
(Signed) A. MCLEAN,
Pres't Mac M. & M. Co.

In reply to the second from "J. L." I merely desire to say, that it is clear he is not familiar with the Crawford Mill, and, therefore, should have been slow to express so decided an opinion as—"for hard ores this principle of crushing of ores is entirely wrong," or—"Until its claims are substantiated by the report of a competent and conservative engineer, I must doubt its efficiency."

The Crawford Mill has been run for three consecutive months, day and night, at Marmora, Ont., on very refractory ore, and especially hard on the wearing parts of ordinary crushers, yet the mill reduced the ore readily to 100 mesh, extracting over 90% of gold—the largest saving ever known in that region. The entire cost of milling (including wear and tear at 20 cents per ton) did not exceed 75 cents per ton. T. J. Lovett, of Chicago, an able mining expert, confirmed by a critical and lengthy examination the accuracy of the above conclusive test. Sir Frederick Bramwell also, who ranks among the foremost engineers of Great Britain, reported, after a most exhaustive series of tests extending over six months, that he believed the Crawford Mill to be the most economical and efficient gold mill ever invented.

Your correspondent is also mistaken as to the cause of the failure of the mill in South Africa; this was but temporary and partial, and due solely to wretched business mismanagement. In the hands of Mr. W. Young Campbell, one of the most progressive and experienced mining men in the Transvaal, the mill is now proving a perfect success.

In the face of these facts, I trust your correspondent will, in future, thoroughly investigate a subject before he commits himself to adverse criticism in print.

ERASTUS WIMAN,

President of The Mechanical Gold Extractor Company.

New York, August 4th, 1892.

[The statement in the ENGINEERING AND MINING JOURNAL of July 23d, that the tailings from the Drumlummon Mine had been worked by the Crawford Mill to 50% of their value was taken from the *Helena Mining Review*, not from statements made by interested parties.—ED. E. & M. J.]

The MacArthur-Forrest Patents.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: That aqueous solution of a cyanide will dissolve metallic gold and silver has been known nearly half a century. No patent could be obtained for dissolving gold and silver with a soluble cyanide, so the MacArthur-Forrest people manage to obtain letters patent for the use of a *weak* solution of cyanide. That is all that is claimed in their main patent, No. 403,202. The words of the sole claims are "subjecting the powdered ore to the action of a cyanide solution containing cyanogen in proportion not exceeding eight parts of cyanogen to one thousand parts of water."

Therefore the claim is not for the use of a solution of a cyanide, which was known to be old, but for a *weak* solution; not such a very weak solution, for 8 parts of cyanogen to 1,000 parts of water is 29½ lbs. of commercial potassium cyanide (K₂CN₂) to 120 gallons of water. Eight parts of cyanogen *sounds* weaker, don't you know, than 30 lbs. of potassium cyanide.

Now that is not invention. As a matter of course, any one would use the solution as weak as possible, if only with regard to cost of cyanide,

The only invention to be found in the specification of this patent is in their reasons given for using a weak solution. I regard them as pure invention.

Unfortunately perhaps for the owners of this patent, it is not a new thing to use weak solutions of cyanides to dissolve the precious metals; for example: in a paper read before the Royal Institute of Great Britain, the great Faraday describes in detail a series of experiments, most care-

stockholders requiring the trustees to stop sending ore to the notorious Nevada mill.

In pursuance of that resolution they have sent the ore to the Brunswick mill (belonging to the Union Mill and Mining Company), and as returns from all shipments are now in we are enabled to give full particulars of the operations under the new management and inclose tabulated statement.

HALE & NORCROSS S. M. CO. (Brunswick Mill).

Date.	Tons of ore worked.	Average value car samples.	Value as per car sample assay.	Average battery assay.	Value as per average battery assay.	Bullion to company, silver at \$129.29.	Discount and charges on bullion.	Net returns to company in bankable funds.	Per cent. of battery assay saved.	Per cent. of car sample saved.	Net yield per ton.
March, 1892.....	400			\$14.99	\$5,996.00	\$4,418.55	\$1,073.93	\$3,344.42	73.69	.....	\$11.04
April, 1892.....	1,900	\$19.09	\$36,271.00	\$15.64	\$29,716.00	\$20,802.11	\$4,941.09	\$15,861.02	70	57.35	10.95
May, 1892.....	1,900	22.58	42,902.00	15.40	29,431.00	19,095.67	4,641.35	14,454.31	64.88	46.84	10.05
June, 1892.....	1,815 ^{1/2}	18.82	34,173.54	17.16	31,159.30	19,810.53	4,390.71	15,419.82	63.58	57.97	10.91
Averages April, May, June...	5,615 ^{1/2}	\$20.16	\$113,346.54	\$16.09	\$90,306.30	\$59,708.31	\$13,973.16	\$55,735.15	66.13	54.05	\$10.63
Occidental Mill.											
April, 1892.....	110			\$15.24	\$1,676.40	\$1,417.18	\$395.04	\$1,022.14	84.5	.....	.....

fully conducted in 1856, in which he used (quoting his words) "a weak solution" of cyanide of potassium to dissolve gold, and still "weaker solutions," and sets forth the results obtained. Faraday's report differs astonishingly from the statement of the MacArthur-Forrest people respecting results of their experiments. By reading Faraday's paper one will know which to accept; it is in "Philosophical Transactions," vol. for 1857.

It may be asked: If the power of cyanide of potassium to dissolve the precious metals has been known so long, why has it not been used to treat ores? It has been so used thousands of times and years ago. It was common in California to stir up quantities of crushed ore or sand, in suitable vessels, with solution of potassium cyanide, then add mercury, with or without a little sodium-amalgam. That is exactly what is described in this patent, viz., treating the ore with a weak solution of cyanide and then obtaining the gold and silver from the solution (using the words of the patent) "by treating the solution with sodium-amalgam." Years ago, in California, this was known as—and is so termed in publications—"milling on a small scale." They did not, usually, prepare the cyanide solutions with care, but would drop a lump or two of cyanide into a comparatively large volume of water and so make their weak solutions.

Why then was not potassium cyanide generally used in large operations? Simply because it was not considered—and it is not—an efficient agent.

The patent No. 418,137, is essentially, for "neutralizing the ore by the addition of an alkali or alkaline earth" (lime). The only comment I will make at present is this, the use of lime to "neutralize" ores, or acids accompanying ores, is almost as old as scientific metallurgy; I believe that an array of the facts would effect extinction of that patent.

The third patent, No. 418,138, is for "a filiform zinc sponge," that is to say, zinc in the form of threads. Now that is a great invention! But why not use zinc in one of the various forms in which it has been used for many years to precipitate comparatively electro-negative metals from their solutions, for example, scrap-zinc, sheet-zinc, zinc wire, galvanizers' waste, zinc turnings, granulated zinc, zinc dust, &c.? Because they must have their little patent and therefore the "filiform." I have been informed by different persons that they really use "zinc shavings," but that is not in accordance with the patent which specifies "filiform" and the use of zinc and iron turnings and borings is old.

In the printed prospectus of the MacArthur-Forrest people one reads (page 10): "On referring to books on electro-gilding we get no assistance, as the invariable method given for the recovery of gold from cyanide solution was, evaporate to dryness and fuse the residue." Why did they not refer to the works of George Gore, LL. D., F. R. S., who is the recognized authority on electro-metallurgy in Great Britain? In "The Art of Electro-Metallurgy," by G. Gore, 1877 (I can go further back, but that will do) under the paragraph heading "Recovery of gold from cyanide solution" you may read: "Add some filings of zinc, in an hour or two all the remainder of the gold will be precipitated."

In their prospectus the MacA.-F. people say "scrap zinc had no effect." That particular scrap zinc should be kept under a glass case as a rare curiosity. Granulated zinc was "disappointing," and as for zinc dust, that would not do at all; only the "filiform"—the patented filiform. I consider this patent as having no greater value than the others.

E. DWIGHT KENDALL, Consulting Chemist.

The Comstock Mill-Ring.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Chas. P. Egan, one of the defendants in the Hale & Norcross case against whom judgment was rendered for over \$210,000, is a captain in the United States Army, and at present is stationed at Boston, Mass., on "duty" under the orders of the Commissary General of Subsistence.

He was formerly stationed at San Francisco in the Commissary Department and while here he was the dummy director and tool for Alonza Hayward, one of the mill-ring.

Egan is at present in San Francisco, having, as he said, "come 3,000 miles to vindicate his character." The way in which he is "vindicating" it, it is said, is by coaching an incompetent reporter for a notorious weekly sheet in the best way to injure the judge who gave the judgment against him. It is the duty of the Honorable Secretary of War to investigate this matter.

Yours truly,
SAN FRANCISCO, July, 1892.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: At the last annual election of the Hale & Norcross Mining Company the control passed into the hands of what was supposed to be new parties. At that election resolutions were unanimously adopted by the

We find upon examination of the table that during the months of April, May and June there was sent to the Brunswick mill 5,615^{1/2} tons of ore, of the value of \$20.16 per ton, or \$113,346.54, counting silver at \$1.29 per ounce. The company received for this in bankable funds \$45,735.15, a difference of \$67,611.39, of which somebody must have got at least a portion. Investigation is in order. D. B. Lyman, superintendent of the Consolidated California & Virginia Mining Company, testified in the trial of Fox vs. Hale & Norcross Mining Company, that there was a difference of 10 to 12% between the car sample assays and the mill assays, and that the mill should always return not less than 65% of the car sample assays.

John W. Mackey, in the same case, testified that the old contracts on the Comstock were to the effect that when mills formerly purchased the ore by wagon assay that they paid 65 per cent. of the wagon assay (this cost the company no mill charge). He also testified that ore worth \$14 per ton by car sample assay would pay all expense and a small profit.

The Secretary of the Consolidated Virginia, while on the stand, read a dozen or more monthly returns from that mine, where 85 to 95 per cent. of the assay value of the ore was returned to the mine. With these facts before us, let us consider the "reform" returns:

Lyman & Mackey are mining men of experience, and their testimony should certainly be final. The car sample value of the Hale & Norcross is \$113,346.54; 65% of this is \$73,675.25. The company received in bullion \$59,708.31; showing a loss of \$13,966.94. This went off in the slimes and tailings, and was worked in the annex for the benefit of the mill owners, and inasmuch as they claim that custom of the Comstock gives these residues to the mill, it is plain to see where they went.

The account of this run at the Brunswick mill is as follows:

Delivered mill 5615 ^{1/2} tons of ore, assay value at mine \$20.16 per ton.....	\$113,346.54
Received for the same in bankable funds.....	45,735.15
Paid for milling 5615 ^{1/2} tons at \$7.....	39,310.67
Net returns from \$113,346.54 worth of ore delivered to the Brunswick mill.	6,424.48

This is 5.66% of the value of the ore at the mine, or in other words ore which was worth \$20.16 per ton at the mine netted the company \$1.14 per ton. After such revelations does any one question that the mines are run for the benefit of the mills?

The principal owners of this mill company are John P. Jones, D. O. Mills, the Sharon Estate and F. G. Newlands. Jones and Newlands are howling exponents of the benefits of free coinage but the mills they own and which crush the ores from silver mines must have their grist in the handsome double eagle, and the stockholders of the companies can stand the discount on the silver.

When the Hale & Norcross mines passed into the hands of the present management they were advised that responsible parties stood ready to reduce the ore of the company and would give them bonds to return them 70% of the battery assay and charge them nothing for the milling.

Under this arrangement the new management would have received for the outputs of the months of April, May and June, the sum of \$63,214.10 in bullion, and allowing the same percentage for discount (as shown in table) to make bankable funds would net \$48,403, against \$6,424.48 received, or a cold loss to the shareholders in the company of \$41,978.52.

Notwithstanding the penalties in the judgment in the Hale & Norcross case, trustees continue to put themselves in a position where they can be mulcted in heavy damages. Of course the dummies chosen to act are execution proof, but fortunately their principal is well known and responsible for the acts of his tools, and the amount wasted can be recovered.

The loss is there—whether it be caused by lack of knowledge or intention—some one must make it good. It was a source of congratulation to the stockholders, that as far as is publicly known the mine is not intrusting any more ore to the thrifty mill men, and that movements are on foot to purchase a mill for the company.

It is to be hoped that if it is purchased that it will be put in different hands from those now abundantly showing either their incapacity or something worse.

While the Brunswick mill in April was saving 70% of the pulp the Occidental mill saved 84% of precisely the same character of ore.

Yours truly,
SAN FRANCISCO, July 25, 1892.
MINING STOCK ASSOCIATION,
per J. H. TINGMAN, Secretary.

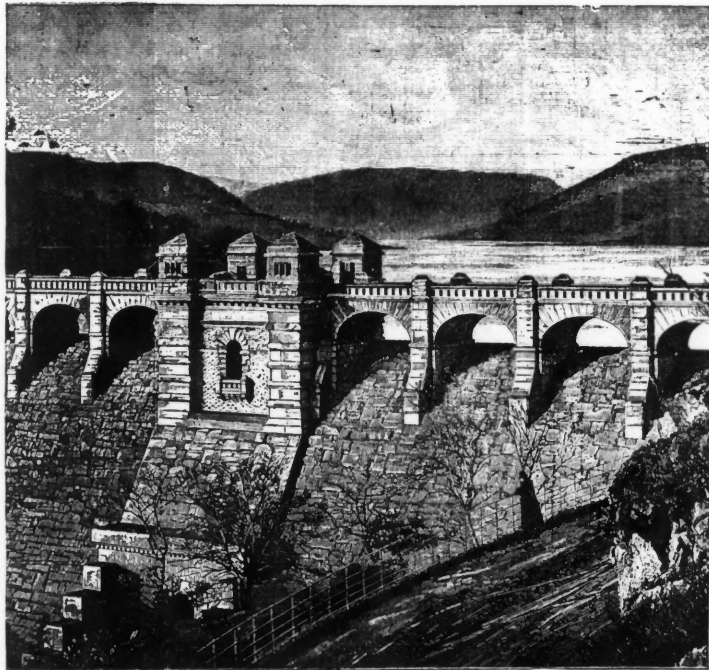
The Panama Canal.—A dispatch from Paris says that M. Monchicourt, the liquidator of the Panama Canal Company, has signed a convention with a syndicate of financiers and former Panama Canal contractors, represented by M. Hielard, vice-president of the Paris Chamber of Commerce, to resume work on the canal. It is said that no appeal will be made to the public for funds until the work is well advanced. The new crop of fools is ripening.

THE LIVERPOOL WATER SUPPLY.

On July 13 was finished one of the greatest engineering undertakings ever carried out by an English municipality, namely the Vyrnwy water-works of Liverpool. Before 1858, Liverpool was supplied with water by a stock company, but at that date the works passed into the possession of the municipality, who further extended them, the water being taken from Rivington Pike, 25 miles distant. The supply proving inadequate, Parliament, in 1880, granted the city power to expend £2,000,000 in buying up the Vyrnwy Valley, demolishing the village in the center, damming up the stream, and in piping its waters to the city. The dam is built of masonry and is similar in construction to the proposed Quaker Bridge dam for the Croton Aqueduct, although unlike the latter, it is built with a weir. At the point where the dam is erected there are mountains at either side, which serve partly to landlock the valley; leaving from rock to rock a space of 1,172 ft. The material used is a hard slate rock found in the vicinity. Its weight is about 2.06 tons per cubic yard, its specific gravity being 2.72. No pieces heavier than 7 or 8 tons are used. The crushing strength is about 800 tons per square foot. The mortar was made from sand found in the valley, pulverized stone and Portland cement.

The total height from the foundation to the parapet of the carriage way is 161 ft. The height from the river bed to the parapet is 101 ft., and from the river bed to the sill over which the water flows is 84 ft. The greatest thickness at the base is 120 ft.; the roadway is 19 ft. 10 in. wide. The slope of the front is 1 horizontal to 7.27 vertical; the slope of the back is 1 to 1.5. Fig. 1 shows magnitude and direction of stresses and contours of foundation.

The lake is the largest artificial lake in England and is two and one-half times larger than Seaton's Reservoir, which is the largest in France; it covers a little over 1,100 acres and has a storage capacity of 12,131,000 gallons. It will supply, when completed, 40,000,000 gallons per day to the city. The river is not altogether dammed up, for under the Act of Parli-



THE VYRNWY DAM FOR THE LIVERPOOL WATER SUPPLY.

ment empowering the construction of the lake, the Severn Commissioners can demand ten million gallons of water per day from the Liverpool Corporation, and forty million gallons four times per month, to take the place of the natural freshets in the river.

Vyrnwy Lake is 825 ft. above sea level and Prescot Reservoir, eight miles from the Liverpool Town Hall, into which the water is discharged, is 276 ft. above the sea level, giving fall of 555 ft. in 69 miles, the distance between the two places.

The aqueduct is the longest in Europe, having a total length of 77 miles, which is 32 miles longer than the famous Claudian aqueduct and 15 miles longer than the Anio Novus to Rome. It consists of tunnels through which the 40,000,000 gallons can pass without filling them, and of three lines of pipes, which vary according to the fall from 39 in. to 42 in. inside diameter. From the greater part of their length these pipes are buried, elsewhere they pass upon arches or through tunnel subways. Only one line is at present completed. Along the line there are four relieving reservoirs, situated on hills rising to the hydraulic gradient of the pipes and one reservoir upon a lower rising to the same gradient.

The first relieving tank is at Parc Uchaf, 9.5 miles from the dam. The difference in level is 85 ft. The filter beds are at Oswestry, 8.5 miles distant, 42 ft. below. At further intervals of 18.5 and 11.5 miles there are other relieving stations, the falls being 260 and 61 ft. respectively. The next fall is to the Norton water tower, the distance being 11 miles and the fall 133 ft. From the water tower to the reservoir at Prescot the pipes pass under the bed of the ship canal, the Mersey, Widnes and St. Helen's canal, and it was here that the most serious engineering difficulty was encountered, for it was necessary to build the tunnel through alternate beds of running sand, gravel and silt. The length of the tunnel was only

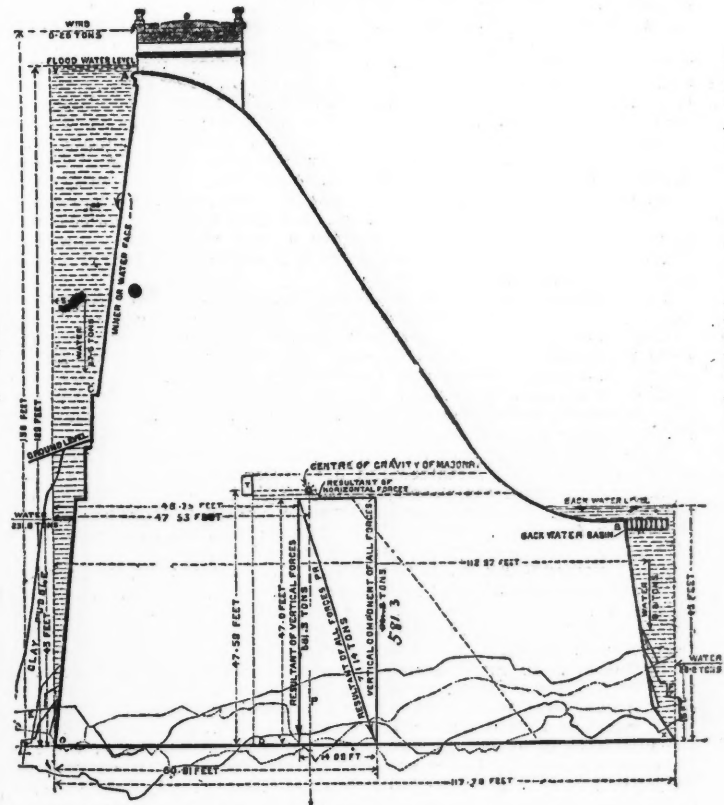
805 ft., but for three and a half years only the slowest progress could be made. The work ruined two contractors and led to the suicide of one of them. On the works themselves there were many casualties and narrow escapes. Finally, no contractor would undertake the work, but the city took it up when the heading was in only 184 ft., and carried it to a successful conclusion.

The tunnel was excavated under air pressure and by aid of the Great-head system of shield, air locks and air compressors being fixed at the top of the iron lining of the shafts. The outside diameter of tunnel is 10 ft., inside diameter 9 ft. The pipes through this tunnel are but 33 in. in diameter.

Of the three other tunnels on the line, one is 2.25 miles long, and the other two about a mile each. They are seven feet high by six feet wide. Their construction presented no serious difficulties.

World's Fair Souvenir Coins.—The Treasury Department has already begun the preparations for coining 5,000,000 Columbian half-dollar souvenir coins, authorized by the Durburrow bill. The designs of the coin have already been selected. The reverse will show the main building of the exposition, and the obverse the head of Columbus.

The plaster cast of Columbus was made by A. J. Dunbar, sculptor of Washington, D. C., from a portrait which is recognized by experts as being as nearly authentic as anything that exists, and is believed to have been painted for Domenico Malliero, a Venetian senator and historian, in 1501. This portrait, with a well-traced history proving its antiquity, was



recently purchased by the United States Consul-General at Frankfort, Germany, for Mr. James V. Ellsworth, of Chicago.

The work of coining the souvenir "Columbian half-dollars" will occupy a month or six weeks. The bill also provides for the striking of 50,000 bronze medals, with appropriate emblems, at a cost of \$6,000, and 50,000 vellum impressions for diplomas, at a cost of \$3,000.

Australian Diamond Mining.—The district of Bingara, in New South Wales, promises to be as rich a field for diamond mining as Cape Colony and it is only waiting for capital to build a railway and bring a supply of water to the scene. For a considerable period prospecting work has been carried on systematically by men familiar with the industry, and a phenomenal wash-up, averaging 300 carats to the load, was one of the results. The various prospectors have proved beyond a doubt that they are in possession of an unlimited supply of diamondiferous wash, averaging one carat to the load upward, with sufficient gold to pay all working expenses. In many instances rich patches of ground are met with, similar to the recent discovery. The diamonds are small and hard, but of fair market value, and the original difficulty in the cutting has been surmounted. The water difficulty once overcome, employment could be found for thousands. The Bingara formation consists of a conglomerate wash, bound together with a discolored clay, containing rolled pebbles of jasper, sandstone, slate, tourmaline, shale and other rocks, carrying with them gold and diamonds; and the sapphire, topaz, garnet, etc., of no particular value. While on the subject of Bingara mining, it may not be out of place to refer to the cinnabar mine, recently opened up in the neighborhood of the town. The field is at present neglected, wanting working capital to develop what may be honestly termed a most promising venture—the rich wash cinnabar from the adjoining alluvial hill giving throughout 75 to 80% of pure mercury. At the time of stoppage of work cinnabar-bearing ground had been traced for six miles along the range, north and south.

* Abstract from an article in London *Engineering* from which paper we have reproduced the illustrations.

VIRGINIA ORISKANY IRON ORES.

Written for the Engineering and Mining Journal by Edmund C. Pechin.

The quantity and quality of the Oriskany brown hematite ores at Longdale, Lowmoor, Victoria and Princess furnaces and near Covington, Va., have been known for many years. A good deal has been published from time to time of large showings of this ore along Craig, John's and Pott's creeks in Craig and Alleghany counties, Va. Within the last year there has been a railroad constructed, now controlled and operated by the Chesapeake & Ohio Railway Company, from Bessemer (probably so called because there are no Bessemer ores anywhere near it) on the R. & A. Division to Craig City or New Castle, some 28 miles, for the avowed purpose of reaching some of these ore deposits. Opportunity has been lately given for inspecting a small section of these ore-bearing lands near New Castle, and what was noted may be interesting to some of your readers.

New Castle and Craig City are practically the same place, New Castle being the old county town of Craig County. For convenience sake the well known name of New Castle will be used.

The railroad in reaching New Castle closely hugs the creek, and in so doing keeps away from the ores in their best condition, which is in the foot hills of the main mountains. The Grace and Roaring Run furnace tracts, on which considerable work has been done, show up very well indeed. Lying at the base of Rich Patch Mountain they can be reached only by branches of two miles and upward from the main road.

There are two insignificant mining operations at Givens and Oriskany stations, which I am told have given great disappointment to their operators. I could see nothing within close proximity to the railroad but a thin sheet of ore, say from 18 to 30 in., lying nearly flat, some of it good ore, but with a good deal of sandy stuff, requiring very close watchfulness in mining and handling. I followed this sheet for several miles up Barber's Creek, a small affluent of Craig Creek, a few miles from New Castle, and noticed no change except at Red Neck about two miles up and near by in the creek. At this point there are bold showings of ore exposed by a long open cross-cut on the hillside, apparently dipping at a sharp angle, with general indications of a local fold. The width of ground underlain with ore cannot be very great, as any deposit must shortly strike and be cut off by ledges of sandstone standing vertically. Developments here as elsewhere are very meager, but there may be a fair extension of this fold on its long axis which may give a very respectable tonnage of ore. Its extent can be readily determined by a small expenditure of money. The ore as exposed looks very well.

We now pass beyond New Castle to the Southwest. By reference to Boyd's map of southwest Virginia, it will be seen the three great valleys of Craig's, John's and Pott's creeks lie parallel with each other, running from northeast to southwest, divided respectively by Pott's or Middle Mountain, John's Creek Mountain and Craig's or Gap Mountain, apparently carrying the extensions of the ores near Covington (Dolly Ann and Iron Mountain) and of the Lowmoor, Longdale, Glen Wilton and Rich Patch mines to the southwest toward New River.

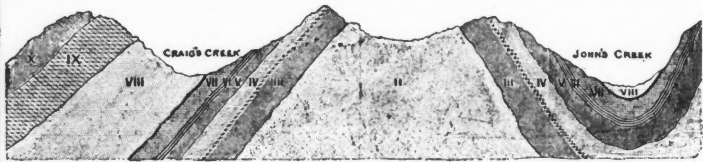
In the great upheavals by which the main mountains were formed, it is evident that the Craig Mountain and John's Creek Mountain formed one great anticlinal fold, while the synclinal trough on either side formed the valleys of Craig and John's creeks (Connell.) Pott's or Middle Mountain is another anticlinal, with Pott's Creek as the synclinal trough, the foothills above all three valleys carrying indications of ore.

I am indebted to Mr. M. A. Connell, E. M., of Craig City, for the cross section of Craig and John's Creek Mountains, near New Castle. Peter's Hill is a long and wide foothill, on the northern and western slope of John's Creek Mountain, about 3½ miles from New Castle, not less than from 250 ft. to 300 ft. above the valley. The whole hill is apparently a blanket of ore. In many places the ore comes directly to the surface, as is shown by constant float, protruding boulders and ledges and sheets of ore. A number of test pits have been put down, which seem to prove beyond question that it is a blanket of from 4 to 6 ft., as in some instances the pits have gone through the ore; and while, as stated above, much of the ore comes directly to the surface. In other places it is covered by from 2 to 5 ft. of clay. The usual characteristics of the Oriskany ore are everywhere to be seen—high grade lumps with inclusions of needle ore—at times quite silicious, and occasionally thin streaks of sandy stuff interposed. Mr. Connell is of the opinion that these ore deposits extend up John's Creek. On the other hand Mr. D. W. Langdon, Jr., who has given very considerable attention to the field, is strongly of the opinion that the ore breaks off a short distance beyond Peter's Hill, so that he does not regard this valley with much favor. As far as external appearances and moderate developments go, the impression left was that the ground inspected offers a fairly good chance for safe mining operations.

Starting again from New Castle and following the southern slope of Gap Mountain, the first showing is what is locally known as the Cliff Opening, about 2½ miles from New Castle. This is close up to the base of the mountain, and the showing is peculiar. Quite a long cross-cut has been made where the ore outcrops. The heavy rains of the season had caused slides of clay, but as exposed the ore is in a series of parallel ribs, with ribs of sandstone between, and dipping at an angle of about 45°. As far as could be seen the hanging wall is sandstone, and immediately next to this manganese shows strongly. In the ribs of ore at times manganese is suspiciously present, and then again the ore is high grade. As it stands, it is a dangerous-looking piece of ground, but it is fairly probable that at a lower depth these peculiarities might disappear. Mr. D. I. Bachman, of the Crozer Iron Company, who was with me, followed on a former visit this showing for a number of miles southward, and reports the outcropping of ore persistent. At the Seven-Pines Opening, some three or four miles beyond the Cliff, the showing was larger, the deposit more clearly defined, and in much better condition. Lying between the Cliff Opening and base of the hill, there is apparently a large area of so-called bog ore. In the shallow pits we saw the ore would require no washing whatever, but simply digging out and loading. Mr. M. Fackenthal, of the Crozer Iron Company, has kindly given me the analysis of an average sample. Iron, 49%; silica, 6.70%; phosphorus, .050%; manganese, .090%. It will be seen at a glance that this is invaluable as an admixture with the other brown ores of the district.

The conclusion to which I came, from what I saw and learned of this section, is that there is every probability of a large ore producing district being opened up. The great trouble is that thousands of acres, covering miles of the ore leads, are in the hands of a comparatively few people, who will do nothing themselves in the way of development, and who ask such prices for their undeveloped property as to absolutely deter legitimate investment. A few pits and cross-cuts have apparently satisfied the owners that their claims of width, great depth and persistence are beyond cavil, and they resent any question of their opinion with even acerbity, and seem to think that the outside world should accept their imaginings and hopes as actual verities. Such a policy will not work in these days. Some money must be spent in clearly showing what there is. For instance, an inexpensive monkey drift, driven into the hillside below the cliff opening, would absolutely determine the size, character and pitch of the deposit. If these should prove favorable, and a shaft sunk lower down the hill, with underground cross-cuts, show the same conditions, I hardly know of a locality where a mine could be opened and worked with greater ease, as the holding of the ore from outcropping downward would give many levels of easy access above water level. At Longdale, the last level is 524 ft. below the outcrop, and at Lowmoor, No. 1 shaft, in a ravine, has proved the ores at a depth of 200 ft., and in both cases the ore is fully as good, if not better, than that higher up. As there is no reason to doubt Mr. Connell's conclusions that Craig's Creek Valley is a great synclinal trough, if it can once be shown that the ore deposit is lying here, as has been proved elsewhere, there may be an enormous basin of good ores available.

It will be seen by reference to the above section, that there is an elevated valley lying between the crest of St. John's Creek and Craig's Gap mountains, in which all of the upper measures are gone and only No. II remains. Mr. Langdon has called my attention to a fact which I do not remember having heard of before and which therefore is entirely new to me, viz., that these No. II. limestones carry brown ores, as in the noted Cripple Creek region. He states that there are indications of very considerable deposits over an extended area. These ores carry, as a rule, low manganese and phosphorus, and would be of very great value, both when used alone or in conjunction with the Oriskany ores. Their location within such close proximity seems to me to warrant an exhaustive examination, especially in view of the fact that the source of Sinking Creek is in this valley, finally flowing into the New River near Pembroke Station



on the New River Division of the Norfolk & Western Railroad Company. It is reported that a feasible line can be had from Craig's Creek into Sinking Creek Valley, and thence to New River.

The importance of such a line can hardly be overestimated, as it would make the Oriskany ores available for all the existing furnaces in Southwest Virginia, and in return give Pocahontas coke, by a short haul, to furnaces located directly at the ores. When the time comes for other furnaces to be built in Virginia, the Oriskany ore field, as far as we can now judge, will be an attractive locality, and this great field can be readily reached and be made highly profitable to the great Virginia Railroad systems—the Norfolk & Western and the Chesapeake & Ohio railways. But this ore region cannot and will not be made attractive to either railway builder or investor without an early and radical change in the policy of the present landowners. To emphasize what has been said above, the Oriskany ore measures must be carefully and critically examined, positive developments made in the shape of shafts, crosscuts and tunnels as will, beyond peradventure, establish the existence of ore in workable quantities and in normal condition or otherwise. If favorable at the outset, such inducements must be offered to responsible parties as to lead them to open mines and get out ores. Until this is done not another mile of railroad should be built or a dollar invested in improvements. The time has gone by when those who bought at low prices can ask or persuade others to pay big money for a "pig in a poke."

Furthermore, if the owners believe as they claim, that they possess such valuable ore properties, let them first prove them, and the results being satisfactory, let them assume a proper risk and lease a certain portion of their proved ground on a reasonable royalty to any good parties who will agree to put up the necessary working plant and make a market for the ore. If there is one-half of the ore that is claimed, ultimately a much larger sum would be received than by a present sale, even at full figures. If the ore is not there, they have simply risked and lost the small amount originally paid for the property.

The chances are that this advice will not be particularly palatable to the owners of mineral lands in Craig County, but is the only plan that will bring them properly into the markets, induce population, distribute wages and finally make their lots salable.

I take this opportunity of correcting a misapprehension which may have resulted from a paragraph in my paper read before the Iron and Steel Institution in New York, which read as follows: "The average yield of the ores (Oriskany) worked by themselves at one furnace in the district is only 40% of iron, as the highest reached by any furnace does not exceed 43%."

I unintentionally did one furnace in the district an injustice, as I have late authentic information that the average for many years past has been 46%, and for the first twenty weeks in this year 1892, the average has been 48.33%.

I have no hesitation in saying, that such a result speaks volumes, not only as to careful mining, but constant and watchful attention in sorting, washing and picking. Further, this is the strongest indorsement possible, of the district as an ore and iron producer

ROANOKE, Va.

A NEW STEEL TIE FOR RAILROADS.

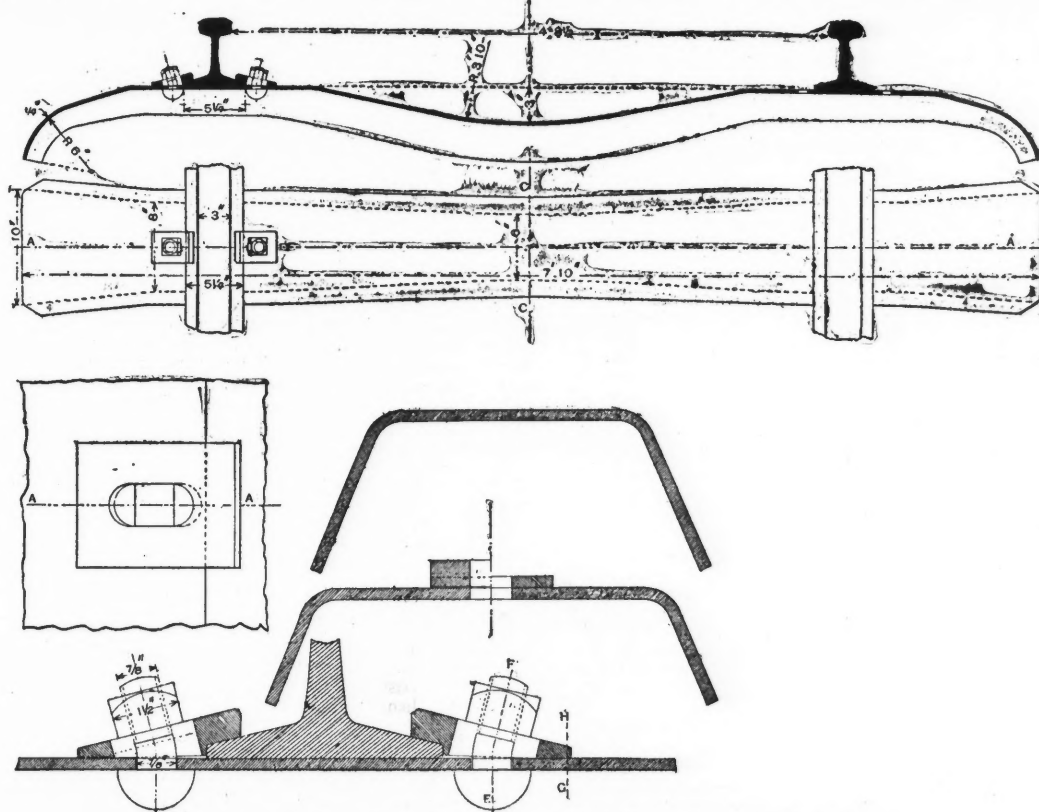
We are indebted to our contemporary, the *Railroad Gazette*, for the accompanying illustration and description of the new steel tie which is now being put down in Fourth avenue tunnel of the New York Central & Hudson River Railroad, in this city. In the main the tie is of a well known type. The clip, however, is a modified form of that adopted in the Hartford tie laid down in the Hudson River road some three years ago; it is now made of soft rolled steel instead of cast iron. The clip is made adjustable instead of being inseparable, as in some designs. The cost of manufacture is thus reduced, and the gauge may be adjusted by the actual gauge line and not by the rail flange. The approximate weight of the tie with its fastenings is 100 lbs., and the rail to be carried is 100 lbs. to the yard.

The steel tie has been adopted in the tunnel, not from the point of view of economy, but in order to make the way really permanent. This is a place where it costs inordinately to touch the track, and where a good deal of money may properly be spent just to keep trackmen out of the way. The usual comparisons of first cost of steel and wooden ties, and of interest and maintenance charges do not hold at all in such a case. There are a good many other places in this country where steel ties can probably be used with considerable economy, even at present relative prices.

So far metal ties have not been a success either in this country or in Europe. The news has lately been received to the effect that the Pennsylvania Railroad are dissatisfied with the results of their experiments with metal ties, which they have been using in various places for the last fifteen years. The assistant engineer of the road states that the metal ties are inferior in every way to wooden ties. On curves it is almost impossible to keep

Trans-Andean Railroad.—According to *L'Echo des Mines* it is expected that all the tunnels of this road will be finished by the latter part of 1893. The tunnels are for the most part in hard rock, and machine drills are used, but as fuel is expensive the water power of the lower valleys was used and the power transmitted by electricity. There are two generating stations at Juncal, on the Chilean side, from which the power is taken to two receiving stations, 3,000 and 7,000 metres distant. From that on the Argentine side the power is taken 3,000 metres. The drills are of the Perroux type, mounted in groups of six upon carriages running on rails. Of the eight tunnels that of Portobello traces a spiral, the radius of curvature being 200 metres. Here the work is the hardest and slowest, as it can be done only at both ends. The other seven tunnels are so situated on the slope of the mountain, which has a slope of 8°, that they can be attacked at several places at one time. At present the road is open from Mendoza to Uspallata, a distance of 91 kilometres.

Magnesium as a Source of Light.—The opinion of Mr. F. J. Rogers, in *Nature*, may be summed up as follows: (1) The spectrum of burning magnesium approaches much more nearly that of sunlight than the spectrum of any other artificial illuminant. (2) The temperature of the magnesium flame, about 1340 degrees C., lies between that of the Bunsen burner and that of the air-blast lamp, although the character of its spectrum is such as would correspond to a temperature of nearly 5,000 degrees C., were its light due to ordinary incandescence. (3) The "radiant efficiency" is 13½ per cent., a value higher than that for any other artificial illuminant, excepting, perhaps, the light of the electric discharge *in vacuo*, for which Dr. Staub, of Zurich, has found an efficiency of about 34 per cent. (4) The radiant energy emitted by burning magnesium



SECTIONS OF NEW STEEL TIES FOR THE NEW YORK CENTRAL RAILROAD.

them in position. They are less elastic than wooden ones and they take no hold on the ballast, but simply grind it to powder.

They are not sufficiently heavy. Strength with lightness is no good, for there must be a dead weight in the tie in order to resist by its inertia the tendency toward displacement caused by the pounding of the train. The expense of manufacture is of course very great. As long as oak is so plentiful and answers the purpose better, there is no reason why such great efforts should be made to employ steel in its place. It is quite probable, however, that the best design for a metal tie has not yet been arrived at, and that in some future day a metal tie will be invented that will present advantages over the wooden one now in vogue. The tie here illustrated must not be looked on as capable of universal application; it only meets a special case where freedom from continual supervision is requisite.

The result of five years' experience with metallic ties on the Belgian State Railroads are given by Mr. Janssen in the June number of the *Revue General des Chemins de Fer*. Two patterns of metallic ties were used, both of the same weight, 165 pounds, but of somewhat different cross-section. The flange rails, weighing 76.6 pounds per yard, are fastened to the ties by movable clips and bolts and nuts. There are twelve ties to a nine meter rail. Careful observations were made on four sections of track with metallic ties and one section of track with half log, creosoted, oak ties. It was found very difficult to keep the metallic tie track in good shape, particularly as the stone ballast was ultimately pulverized by the ties, necessitating the addition of new ballast. The metallic ties are themselves in damaged condition, owing to cracks which start at the bolt holes. Out of 240 ties of each pattern which were carefully examined, 77.5% of the Braet form were more or less cracked, and 17.9% of the Post type were similarly damaged. Up to the time of making the report the track with metallic ties has cost for maintenance about nineteen times as much as the track with creosoted oak ties. Beyond this, many of the metallic ties are damaged to such an extent that they must soon be removed.

is about 4,630 calories per gramme of the metal burned, or 75 per cent. of the total heat of combustion, as compared with 15 per cent. to 20 per cent. in the case of illuminating gas. (5) The total efficiency of the magnesium light is about 10 per cent., as compared with 0.25 per cent. for illuminating gas. (6) Taking into consideration the greater average luminosity of the rays of the visible spectrum of the magnesium flame, it is certain that, per unit of energy expended, the light-giving power of burning magnesium is from fifty to sixty times greater than that of gas.

Coating Iron with Copper.—A process has lately been introduced in France and England by M. Edouard Martin for protecting steel and iron by means of a coating of copper. When the invention was first made it was applied to the construction of telegraph wires, but since then it has been developed, and at the present time composite ship plates are being made. The process is similar to the old silver-plating process, in which plates of the two metals were rolled together without any chemical or electrolytic means being employed. A short copper ingot is cast on a core of iron or steel; the copper is shorter than the core and not placed symmetrically, but disposed toward one end, so that the unequal travel of the coating, when afterward extended by rolling, may be compensated for. Save for the provision of special grooving of the rollers to prevent the formation of fins of the softer metal, the subsequent operations are conducted in the ordinary way. Advantage is taken of the retention of heat by the core to allow of performing the rolling under such conditions that the ductility of the two component metals is approximately equal, by permitting the composite bar to cool slightly after the first passage between the rolls, by which means the copper covering is chilled somewhat, and its excessive ductility diminished without impairing that of the steel core. This application is satisfactory enough, says the *Engineer*, but the compound ship plates made on this system are not yet proved to be a success, owing to the porosity of this coat of copper and to the difficulty in obtaining perfect adherence.

EARLY MINING OPERATIONS ON THE COMSTOCK.

Written for the Engineering and Mining Journal by Dan de Quille.

At first the prospectors who invaded the silver region from the California side of the Sierras set to work upon the quartz veins they "located" in a very primitive way. Few of the first comers were men of means, and the majority were adventurers who had hardly enough money to "keep the devil out of their pockets." They desired to ascertain the metallic contents of the veins on which they had "taken up" claims as soon as possible, and at the very smallest cost of money and muscle. Generally the first movement made was to start an open cut a short distance below their vein (if it were on a hill side, as was the case nine times out of ten), and, running it on a level, drive it to and through the quartz croppings. This open cut would cross the vein at a depth of from 5 to 20 ft., according to the pitch of the hill, showing the character of the quartz below the surface and both walls. This was called "defining the vein."

The next move was either to set to work upon the vein where exposed in the cut and follow it down with an incline (run on the dip of the vein) or to go down the side of the hill to a certain distance and start a tunnel to cut the lode at depth. Many ambitious men, in their anxiety to secure great depth, started their tunnels at such a distance from their claims that they never reached their veins; they fell by the way, dead broke.

In case of a vein dipping toward ground so flat that a tunnel—even a long one—would tap the lode at an insignificant depth, then a shaft would be sunk. By taking the dip of the vein where exposed in the open cut the prospector could easily calculate where to sink a shaft in order to reach it at a depth of 100 ft. or 200 ft., or any depth to which he might elect to go upon it. Or he might start his shaft at such a distance from the croppings that it would cut through his vein at a depth of 500 ft., then from this shaft he might drift to his vein at a depth of 100 or 200 ft. and cut across and examine it, when, if he wished to explore it to greater depth, he need only return to his shaft, sink it deeper, and again drift to his vein. As the vein would be constantly approaching the shaft as sinking progressed the exploring drifts would continually grow shorter. At the depth of 500 ft. the shaft itself would cut through and prospect the lode. If the indications were favorable for finding ore the miner could still continue sinking his shaft, but now his exploring drifts would be sent in the opposite direction, if he had been drifting west above when his shaft passed through the vein; below that point he would drift east to reach the lode.

At first the shafts sunk in the silver belt were mere round holes—like an ordinary well—for such were the prospecting shafts everywhere seen in California, whence came the men who were swarming all the cañons, valleys and mountains. These first round shafts were small, and had exceedingly ragged and jagged walls. Being sunk in hard rock—the shell of the country—these circular shafts stood well without timbering. All hoisting of rock, ore or water, however, had to be done in a bucket, and either by hand, with an ordinary windlass, or with a horse whim—hoisting cages could not well be used in such a shaft, and, indeed, were not then thought of by common miners.

As a newspaper reporter it was my duty to explore these "holes in the ground," and inspect alleged ore strikes or "indications" about which owners were bubbling over with excitement, therefore I early got a surfeit of them. In descending the shafts one had choice of two means of support—might either stand in the tub or place one foot in a loop formed at the end of the windlass rope. The man new to this kind of navigation is astonished at and disgusted with the efforts his body seems making to assume a horizontal position; by holding too hard upon the rope where grasping it above his head with his hands he causes his feet to "scoot" hither and thither in a very uncertain way, and he feels as helpless as one who for the first time mounts roller skates. Often, too, the windlasses were rickety, swaying make-shifts. A light temporary windlass set up to serve to sink 25 or 30 feet would frequently be used to go down 80 or 100, the owners always looking upon it as being as good for the next foot as for the last.

I once descended a round shaft 300 feet in depth with my foot in a loop at the end of the rope. It was a new grass rope just put on, and as it stretched under my weight the extra twist began to come out, causing me to spin round like a top. In trying to check this sickening motion I thrust my hand against the wall so forcibly as to set my body swinging from side to side, pendulum fashion, striking first one side and then the other of the shaft. The men above at the windlass knew nothing of my trouble and sent me right along down. Each time that I collided with a jagged point of rock the downward motion gave me a rake of a foot or more before I swung to the opposite side to receive a rake in a fresh place. Once this pendulum motion begins with one at the end of 150 or 200 ft. of rope it is not easy to check it. After receiving two or three severe rakes a man is sure to try to fend off from the rocks, and is almost sure to miscalculate and use too much force, for even the slightest push sends him back against the opposite walls. I was almost skinned alive before I got out of my deep shaft, and never again made such a trip on a rope that had not been long enough in use to have the twist taken out of it. There is nothing worse than such an experience except it be climbing four or five hundred feet of vertical ladders.

Hundreds of these round shafts were sunk everywhere in the neighborhood of the Comstock and for miles about in the surrounding mountains and flats. They ranged in depth from 20 to 100 or 200 ft., and as the prospectors who sunk them never troubled themselves with covering or fencing them in, they in after years (when hidden by growths of weeds and brush), became so many death-traps. The list of accidents resulting from these old shafts would be a long one; they have, first and last, cost scores of lives, have caused many broken bones, and in some cases frightful suffering—men lying in them mangled and almost dead from hunger and thirst before being found and rescued. Dead bodies and skeletons are to this day not infrequently found in the old shafts out among the hills. Among these are no doubt the remains of not a few of the men advertised as missing and never heard of.

Tunnels also abounded in early days. They were run into the hills all over the country. Long after the sinking of round shafts was dropped the running of tunnels continued. They are to be seen of all lengths, from the mere start of 10 or 20 ft., to such as are from 500 to 2,000 ft. When the big snow-storms of the winter of 1859-60 surprised the silver hunters, many of them took refuge in the tunnels they had commenced.

By widening a portion of a tunnel a few feet inside of its mouth very comfortable quarters were made, as the ground was firm and dry.

In the floors of many of these old tunnels shafts were sunk by the early prospectors, and these have cost the lives of many persons and rendered many more cripples for the remainder of their days. Persons—both men and boys—urged on by curiosity venture back into the darkness of the old tunnels and before they are aware of the presence of a shaft have made a fearful plunge of 50 or 100 ft. The discovery of persons so trapped has at times seemed almost miraculous. Several persons have been discovered by the merest chance and rescued, battered and broken in limb, when almost at the last gasp, and after they had lost all hope of ever again seeing the light of day.

After the first rush and excitement of prospecting was over, and the owners of mining claims settled down to the steady work of developing the veins on which they had located, substantially timbered square shafts began to be seen, and soon all working shafts began to be made with two or more compartments. At first there was a compartment for pumping and one for hoisting; then soon followed three compartment shafts, two being for use in hoisting ore and waste rock. This, however, was after steam hoisting and pumping machinery began to be set up pretty generally.

The first steam machinery for hoisting and pumping was erected at the Ophir, where the first discovery of silver ore was made. As soon as men from California obtained control of the mine they began to sink upon the vein, which was found to dip to the west. An incline was started which followed the dip of the vein. A donkey engine of 15 H. P. was set up at the top of the incline to do the hoisting and to run a pump, the column of which was only about four inches in diameter. To the old Gold Cañon placer miners this plant of machinery seemed very powerful, and they were never tired of admiring it. Listening to the puffing and wheezing little engine, and watching the creaking and sputtering pump, an admiring old Johnstowner one day said: "By mighty, with that air big steam ingin' these 'ere California fellers will purty soon turn old Sunrise Peak inside out!"

The company timbered their incline in a substantial manner, laid in it a track for lowering and hoisting ore cars, and the depth being trifling, were able to bring out ore very rapidly, for they were working in the heart of the first bonanza ever opened on the Comstock. There was nothing to do but dig down the ore and shovel it into the cars. In much of the soft, decomposed silver ore one could see bright spangles of free gold. Such was much of the ore sacked for shipment.

The Mexican and other mines near the Ophir were opened by means of inclines that followed the dip of the vein, but at the Gould & Curry, where the rich ore was next found (about half a mile south of the Ophir), a tunnel 250 feet in length was run to the vein at a considerable depth beneath the croppings. Winzes were then sunk upon the ore and drifts run along the vein, upon which chambers were opened in the bonanza. Once the ore-chimney was found, drifts were run and winzes sunk with astonishing rapidity. The mine was at first worked through tunnels. In all three tunnels were run, the lowest being 2,000 feet long, and tapping the vein at a depth of 425 feet. They did not begin sinking their first big working shaft until 1864. The Savage mine, which adjoins the Gould & Curry on the south, was opened by means of a shaft. The bonanza in the Gould & Curry was in the southern part of the claim, and had an inclination to the southward, which at a depth of about 500 ft. carried it into Savage ground. The southward pitch of the chimney being early observed, the Savage Company had a pretty sure thing when they began sinking their shaft.

Although they first began working the lode at Gold Hill by means of pits sunk in the rich, decomposed, gold-bearing quartz of the surface, they soon set to work at sinking large vertical shafts, using steam power in hoisting and pumping. All the first engines were small, though then looked upon as being quite powerful enough for any work that would ever be done on the lode. When, in these early days, a few "cranks" talked of sinking to the depth of 1,000 feet on the lode, most mining men turned and walked away from them, not wishing to seem to countenance any such wild and ridiculous proposition.

In 1861 Superintendent Deidesheimer, of the Ophir, asked for an engine of 45 H. P., and 8-in. pump and improved hoisting apparatus. The officers of the company thought this terribly extravagant at first, and the stockholders said they might as well shut down the mine at once "if all that came out of it was to go for machinery." They could not see the utility of such "tremendous power" as their superintendent said he must have. Had such machinery as the Ophir now possesses been asked for every member of the company would have fallen in a faint at mere mention of it and its probable cost.

The Properties of Pyrophoric Manganese.—The chemical reactions of manganese as left by distillation from its amalgam have not been much studied, says the *Bulletin de la Société Chimique de Paris*. The metal thus obtained is pyrophoric and decomposes certain of the most stable substances. In a current of carbon monoxide it burns with heat sufficient to raise the metal to white heat, and the decomposition of the gas is so rapid as to produce a partial vacuum in the apparatus. The action of carbon dioxide upon pyrophoric manganese is the same as that of carbon monoxide. Pyrophoric manganese reacts also upon gaseous sulphurous acid. With nitrogen dioxide and boron chloride there is also rapid absorption and great liberation of heat.

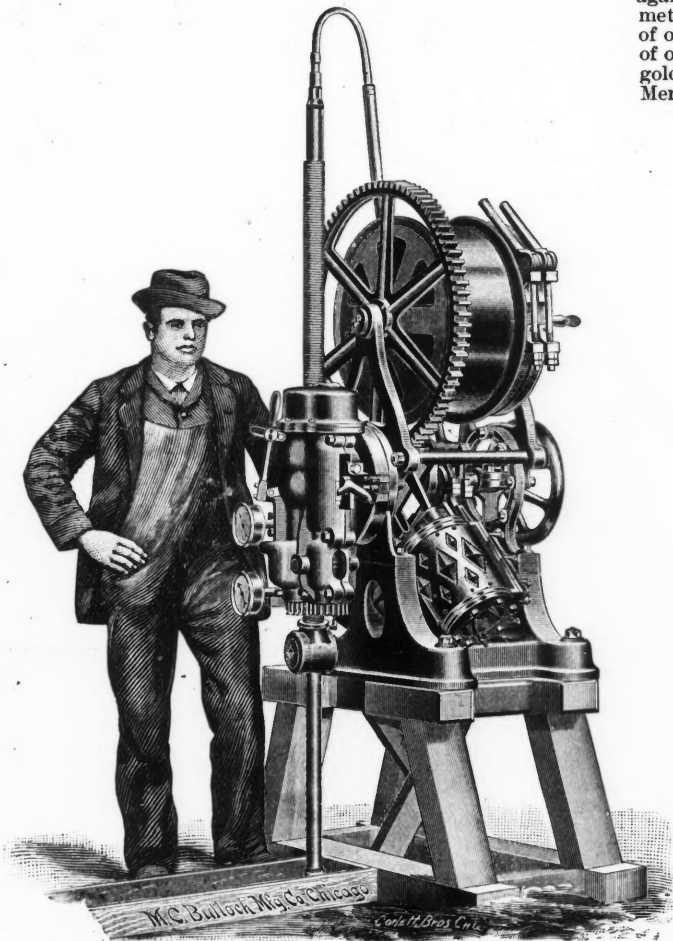
Deep Coal Mining in Europe.—The upper seams of coal in the continent of Europe are being gradually worked out and it is found necessary already in many quarters to commence work at greater depths. The upper seams are mostly thin, but lower down the deposits are much thicker, so that the difficulties attending excavation at such great depths will be in some degrees compensated. In the Mons district in Belgium some shafts have lately been sunk to the depth of 1,150 metres. Though the coal is excellent the hindrances to mining are tremendous. There are many formidable blows of gas, and water at 50° C. enters the cuttings in great volumes. Some very powerful pumps are being put down in order to keep the workings clear of water. It has also been found necessary to replace the ordinary wooden timbering with steel props.

THE BEAUTY AND CHAMPION DIAMOND DRILLS.

We take pleasure in presenting to our readers cuts and brief descriptions of several new types of prospecting drills which have never before been illustrated. They are designed and manufactured by the M. C. Bullock Manufacturing Company, of Chicago.

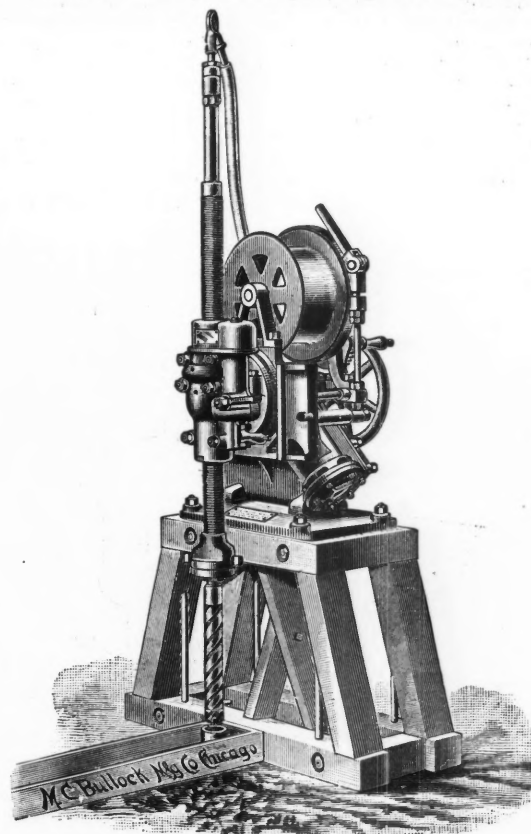
The "Beauty" drill has been especially designed for prospecting in advance of tunnels, headings or similar cramped positions in underground mining. It has been used with the most flattering success in boring through the extremely hard measures found in the iron, copper and silver mines of Lake Superior. The "Beauty" is adapted to drilling holes 1 7/8 in. in diameter, taking out a core 1/8 in. in diameter to a depth of 700 ft. Its total weight is a trifle under 450 lbs., and it can readily be divided into packages of 150 lbs. each for pack-mule transportation, while it occupies off its columns only a space of 20 in. square.

When used for prospecting inside of mines the "Beauty" is mounted on columns, making a most convenient arrangement for rapid and successful explorations in tracing ore bodies.



THE MINERAL STATISTICS OF GREAT BRITAIN.

We give herewith a general summary of the mineral product of Great Britain and Ireland during 1891, according to the official Bluebook just published. Coal, iron and stone form the bulk of the product and the remainder of her mineral resources, with the exception of tin and arsenic, have no influence on the world's markets. The total value of the production was £91,238,032, as compared with £92,794,481 during 1890. This slight decrease was evenly distributed throughout the list. The quantity of tin ore raised in 1891 was 14,488 tons, valued at £785,240 and yielding 9,353 tons of metal, as compared with 14,911 tons, valued at £782,492 and yielding 9,602 tons of metal in the previous year. With the exception of 44 tons from Devonshire, the whole of the supply of ore was mined and smelted in Cornwall. Of lead ore there was raised in 1891 43,859 tons, valued at £356,783 and yielding 32,204 tons of metal, as compared with 45,651 tons in 1890, valued at £406,164 and yielding 33,590 tons of metal. During 1891 279,972 ounces of silver was extracted from silver-lead ores, as compared with 291,724 oz. in 1890. The yield of copper ore in British mines sunk still lower in 1891, being 8,836 tons or 720 tons of metal, as against 12,136 tons, or 936 tons of metal in 1890. Zinc, unlike the three metals already mentioned, shows an improvement. In 1891, 22,216 tons of ore, or 8,891 tons of metal, were raised, as compared with 22,041 tons of ore, or 8,582 tons of metal. We may also mention that 4,008 oz. of gold were extracted during 1891, mostly from the Morgan mine in Merioneth. Of other metals, antimony, manganese, strontium, ura-



THE BEAUTY AND THE CHAMPION DIAMOND ROCK DRILLS.

For surface prospecting the "Beauty" is mounted on a bedplate with a compound geared hoisting drum for hoisting and lowering the rods. It is also arranged with columns and reel on a bed plate and hoist rig interchangeable, so that it may be used either upon the surface or underground in the mines.

The "Champion" drill presented herewith is built from a new design covering a complete remodeling of the old "Little Champion."

This machine is thoroughly well built in every particular. The bevel and feed gears are all cut out of solid cast steel and arranged to run at the highest speed without rattle or jar or lost motion. All bearings are fitted with bronze liners, while the frame and all the lighter castings about the machine are made of cast steel. The machine is built to jigs and templates and all parts are made in duplicate, so that in case of an accident or breakdown any part may be ordered by letter or wire with an absolute certainty of its fitting the machine on its reaching its destination.

The machine, as shown in the cut, is arranged with several different sets of feeds which can be changed instantly while the drill is running by moving a lever and detent, thus permitting the operator to change the advance of the bit to adapt it to the character of the rock, permitting him to run at a maximum speed under all circumstances and at the same time allowing him to avoid forcing the diamonds beyond their cutting capacity.

The general outline of this type of machine is so well known that we deem it unnecessary to give an exhaustive technical description of its mechanism.

This machine is fitted with the Patent Thrust Register, which is of the greatest value where accurate results are required, and constantly shows changes in hardness of the rock, condition of the bit, and the thickness of each stratum or width of seams while the drill is running at full speed.

niun and tungsten were produced in trifling and fluctuating quantities. The following table gives the quantities of minerals produced in Great Britain and Ireland during 1891:

	Tons.	Value at mine in pounds sterling.	Metal obtainable.
Alum clay (Bauxite).....	10,763	3,225	
Alum shale.....	5,474	684	
Antimony ore.....	154	250	138 cwt.
Arsenic.....	6,048	58,593	
Arsenical pyrites.....	5,095	4,370	
Barytes.....	26,876	32,129	
Bog ore.....	16,075	8,037	
Clays (excepting ordinary clay).....	3,222,035	943,896	
Coal.....	185,479,126	74,099,816	
Copper ore.....	8,836	20,214	
Copper precipitate.....	322	4,355	719 3/4 tons.
Fluor spar.....	141	187	
Gold ore.....	14,117	12,200	4,008 oz.
Gypsum.....	151,708	60,038	
Iron ore.....	12,777,689	3,355,860	4,528,312 tons.
Iron pyrites.....	15,463	8,002	
Jet.....	(lbs.) 766	153	
Lead ore.....	43,859	356,783	32,205 tons.
Lignite.....	4,664	1,360	
Manganese ore.....	9,476	6,213	
Ochre, amber, etc.....	13,692	20,103	
Oil shale.....	2,301,119	707,177	
Petroleum.....	100	150	
Phosphate of lime.....	10,000	20,000	
Salt.....	2,043,591	976,824	
Silver from lead ore.....			279,792 oz.
Slate and slabs.....	415,029	987,000	
Stone, etc.....		8,693,743	
Strontium sulphate.....	8,061	4,030	
Tin ore.....	14,488	735,240	9,353 tons.
Uranium ore.....	31	620	
Wolfram.....	138	3,341	
Zinc ore.....	22,216	113,445	8,891 tons

THE HISTORY OF THE PETROLEUM ENGINES.

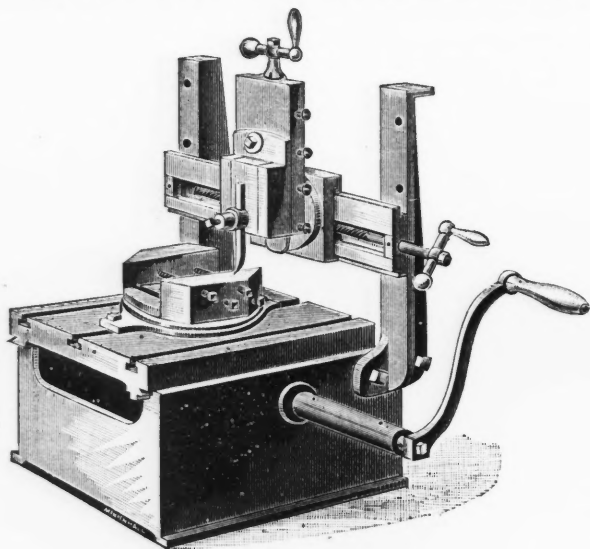
Written for the Engineering and Mining Journal by Edward Walker.

The introduction of the Priestman petroleum engine on the American market as announced in the *ENGINEERING AND MINING JOURNAL* of July 23d, p. 81, makes it interesting to investigate the previous attempts to make use of oil for motive power purposes. We do not here refer to the employment of petroleum as a substitute for other fuel in raising steam, but confine ourselves to those cases where the burning of the vapor of oils takes place in the engine cylinder itself. The Lenoir petroleum motor was the first to attract attention about a quarter of a century ago. In this motor air is drawn through a carbureting chamber in which gasoline is dashed about by vanes. The carburetted air, mixed with additional air, is led to the engine cylinder where it is used in the same way as gas is in a gas engine.

In 1873 Brayton brought out an improved machine, in which a heavier and safer oil was used instead of gasoline. An air-compressing pump forced air at a pressure of 60 lbs. per sq. in. through petroleum. The carburetted air was passed through a regenerator of wire gauze, which was heated by the exhaust. The combustion in the cylinder was slow instead of explosive, and the working fluid expanded at constant pressure. The stroke was completed by expansion. Oil of a density of 0.85 was used, and the consumption is stated to have been 2.7 lbs. per brake horse power hour.

In the Spiel engine a jet of oil is sprayed into a current of air, which enters the cylinders during the suction stroke. The action in the cylinder is the same as that in the gas engine. Only benzoline or petroleum spirit of a density of 0.7 can be used, and the consumption is put down at 0.91 lbs. per horse power. Messrs. Delamere-Deboutville & Malandin, of Rouen, have adapted their "Simplex" gas engine to work with a gas produced from gasoline of a density of 0.65 to 0.70. A stream of gasoline mixed with hot water drips down a vertical chamber over a wire brush. The chamber is heated by water from the cylinder jacket. The water introduced with the gasoline washes the gas produced, which passes through a valve, and is used as in a gas engine.

Petroleum motors of quite a different type are the naphtha launches of



SHEPARD'S HAND PLANER.

the Herreshoffs. In these not only is petroleum spirit used to produce heat, but the vapor of naphtha is used in the place of steam. Similar engines for boats have been built by Escher Wyso & Co. in Switzerland and by Yarrow in London. There is every reason to believe that the naphtha vapor has a greater thermal efficiency than steam, due either to the less prejudicial action of the cylinder walls, or to the lower temperature of condensations. The only oil which can be used in these engines is, however, of the dangerous class.

The Priestman petroleum engine was first produced in 1888, and may be said to be the first engine in which the ordinary safe petroleum could be used successfully. The patents are those of Eberé, and their principle consists in spraying the petroleum and then evaporating the spray. A jet of oil controlled by the engine governor mixes with a current of air in a spraying nozzle, and the oil is thus reduced to a spray of exceedingly fine particles. The mixed air and spray are received in a vaporizing chamber, which is heated by the passage of the exhaust gases through a surrounding jacket. During the suction stroke an additional air supply, also regulated by the governor, enters the vaporizer and drives forward the vaporized air into the cylinder. This charge is compressed on the next return stroke, and is ignited by an electric spark at the commencement of the next forward stroke. The cycle in the cylinder is precisely the same in an Otto gas engine.

Since the Priestman engine has been brought out several others made on similar lines have been introduced. Crosby Brothers, of Manchester, England, the holders of the original Otto patents, have recently put an extremely efficient oil engine on the market which gives a brake horse-power hour at an expense of $\frac{1}{4}$ pint of "royal daylight" oil.

The simplest petroleum engine is that made by Weyman & Co., Guildford, England. This engine is spoken very highly of by the *Engineer*, whose associate editor, Mr. Beaumont, has made a special study of it. This oil engine is really a slight modification of the "Trusty" gas engine made by the same firm. It differs from the Priestman chiefly in doing away with the sprayer and the air pressure in the substitution of a heated tube for an electric igniter, and in the adoption of greater compression of the charge. The oil is pumped drop by drop by a tiny pump in small quantities as required at each revolution; it falls in drops into a vaporizer,

which is heated by the products of combustion from the cylinder, and the vapor thus formed is drawn into the working cylinder together with a supply of air. The ignition is effected by the ordinary oil flame. There is no spraying apparatus and everything is extremely simple.

There are other petroleum engines on the market, such as the Hornsby-Akroyd in England in which the charge is exploded by bringing up the temperature to the flashing point of compression; the Capitaine oil engine in France, in which the ignition of the compressed charge takes place in the vaporizer, and others that need not be mentioned.

In the preparation of this short notice I have drawn largely on the paper on Petroleum Engines read by Professor Unwin before the English Institution of Civil Engineers and on the official report of the discussion which followed.

SHEPARD'S HAND PLANER.

This machine, the invention of H. L. Shepard, of Cincinnati, O., is particularly adapted for machine and repair shop work. The machine shown in the illustration is 12 in. long, 9 in. wide and 8 in. in height. Another size is 24 in. long, 12 in. wide and 12 in. high. The feeds are operated by hand instead of being automatic. The crosshead, which carries the tool holder, may be fixed at any desired point by means of screws, which are inserted through the standards. The cross and down feed of the machine is governed by the handscrews shown. The tool holder is seated upon a radial base, thus allowing the tool to cut at any desired angle. As will be seen by reference to the illustration, the bed has three parallel grooves, which receive the key of the work holder.

The work holder is supplied with three adjusting screws; the holder also is so arranged that it may be placed at any angle to the cross-head. The reciprocating motion of the bed is attained direct from the crank by means of gears, which are arranged to become alternately engaged and disengaged with the rack on the bed. The manufacturer claims that the machine is accurate in its work, and that its speed admits of better results for small jobs than can be attained on a large tool. If so desired the machine can be equipped with automatic feeds and pulley for motor power. Each planer is supplied with a universal planer chuck. Its moderate cost and its adaptability for general shopwork makes it a machine that will be appreciated by those doing work by hand, which might be accomplished with ease and accurateness on this little tool.

THE GEM SPEED ALARM INDICATOR.

The illustration shows a compact and reliable instrument which differs materially from the ordinary indicators. The principal feature is the arrangement of an alarm bell on the back of the indicator dial. The spindle is arranged with a worm thread which engages with the graduated wheel, and this wheel is so marked that the spindle may turn either right or left and still show the revolutions. This result has heretofore



THE GEM SPEED ALARM INDICATOR.

been attained by having the spindle with double ends. In this instance two hands are used on the dial; these hands each having a separate circle or scale upon which they register.

The scales are numbered in different directions: A shaft running from left to right will be indicated on the outer scale and one running from right to left on the inner one. The most conspicuous feature of the device lies in the fact that the dial registers hundreds only. Whenever the hundred revolutions have been made a bell rings. The bell hammer is actuated by means of a pivoted toggle on the back of the indicator dial. This toggle is held near its outer end by two pins, which prevent its swinging out of place, but which allow it to swing sufficiently to work on both the right and left hand motion. E. S. Greeley & Co., of New York, are introducing the goods, which are retailed at \$1.50 each.

Care of Black Lead Crucibles.—Mr. Alex. Cairns says in *Iron* that the principal trouble found in using black lead crucibles arises from a general lack of knowledge of their action when suddenly heated under ordinary circumstances. Being of a porous nature they absorb moisture very readily; from this fact the most common defect known as flaking originates. In appearance flake is a scaling off of parts of the bottom of the crucible; in principle and action it is similar to the cutting or scabbing of sand in a mold, which in both cases depends on the amount of dampness in the mold or crucible. In other words, it is the too quick application of heat to a crucible containing moisture, and the consequent sudden generation of steam which does not have time to escape that is the cause of flaking. In shops where little attention is paid to this subject they are usually left on the ground, brick floor or iron furnace top, where they get damp through the night, especially in rainy seasons; in the morning they are filled with gates and ingots, and almost immediately placed on the hot fire. The one thing necessary to insure the crucible's lasting as long as possible is to be certain they are dry before using. Each crucible should be placed in its corresponding furnace, mouth down, at the time of starting the fire in the morning; they will then dry gradually and not suddenly enough to produce flaking, and can be allowed to get to or above a red heat, when they can be taken out, filled and returned.

MOLLOY'S NEW CYANIDE PROCESS.

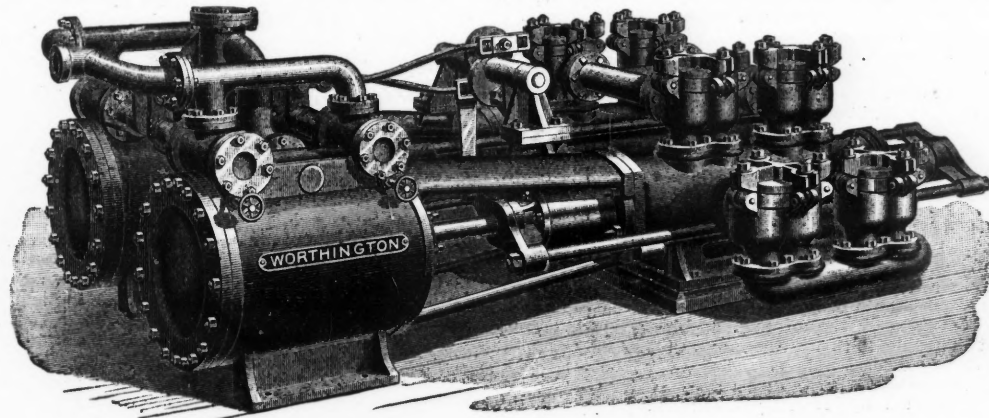
The *South African Mining Journal* gives a preliminary account of a new cyanide process for the extraction of gold from tailings, invented by Mr. B. C. Molloy, of Johannesburg. The improvement consists in the abolition of zinc as a precipitator of the gold, and in the revivification of the cyanide of potassium solution. In the new process the tailings are treated with cyanide of potassium solution as usual, and the resulting liquors are passed through a patent "Molloy separator." This separator consists of some sort of an amalgamator, through which a weak current of electricity is sent. When the solution containing the double cyanide of potassium and gold is sent through the separator, metallic potassium is released on the mercury, and this potassium immediately replaces the gold in the cyanide. The gold is thus amalgamated, and the liquors pass out as revived cyanide of potassium.

One advantage claimed for this process is the possibility of obtaining the gold in the form of an amalgam and thus avoiding the loss inseparable from the treatment of gold-zinc slimes. The retorting of the gold amalgam, also, does not require the skilled labor which is necessary for the reduction of such slimes. The most important advantage, however, is the regeneration of the cyanide of potassium after the precipitation of the gold. The chief cost of the cyanide process as hitherto worked has been due to the entire loss of the cyanide of potassium. Its economical recovery process must necessarily result in a great reduction of working expenses.

Several trials of the process have been made by Dr. Simon, an eminent authority in Johannesburg. One solution whose original contents were 2 oz. 18 dwt. of gold per ton, was found to contain only 1 1/4 dwt. after it had passed the extractor. Further trials are now being made, and if they establish the process as a commercial possibility, Mr. Molloy will give full details of his invention. Experiments in this country with the use of mercury as a precipitating agent have not proved a success and we have reason to doubt the claims for this process, particularly those for the regeneration of the solutions.

THE WORTHINGTON MINE PUMP.

The pattern of mine pump shown in the accompanying illustration is especially designed for station work in deep mines, all parts being con-



THE WORTHINGTON MINE PUMP.

structed with due regard to heavy pressures and severe work. The design of the water end has proved highly successful in this class of work.

All parts that are subjected to pressure are subdivided as much as possible, so that in case of rupture or break only a small portion of the entire water end will have to be replaced. The water valves are contained in valve pots or chambers and are so situated as to be easily accessible by means of swing-bolt covers. The plungers are four in number, arranged so that the adjustment of the glands, the replacing of packing in the stuffing boxes, etc., may all be done from the outside.

The steam end of this pump possesses some new features that are particularly worthy of notice. In the large pumps the old style valve has been replaced by rotating plug valves, causing a lessening in complicated valve motion, and allowing the valves to be always accessible for examination. In order to examine the valves it is only necessary to remove the bonnets and pull out the plugs. Another advantage gained by the change is, that the usual balancing devices used in connection with the steam valves is unnecessary. The most important feature of this pump is, however, the great reduction in waste clearances over the slide valve pump and consequent economy in steam consumption. When so desired, these pumps may be fitted with compound steam cylinders, and still better results may be obtained by making them compound condensing. These pumps are made by Henry R. Worthington, of New York.

Wire Netting in Plate Glass.—A German firm at Dresden, Saxony, is manufacturing plate glass in which wire netting is imbedded. This construction not only gives additional strength to the glass, but it also protects the windows from burglarious attacks. It is, therefore, coming largely into use in Germany for skylights.

Explosives for Coal Mines.—A French Commission has recommended the following mixtures as explosives for coal mines: 1. 20% dynamite (75% nitro glycerine and 25% silical) + 80% ammonium nitrate, coal; 40% dynamite and 60% nitrate, stone. 2. Blasting gelatine (91.7% + 8.3% mononitric cotton), 12% + 88% ammonium nitrate, coal; 30% + 70%, stone. 3. Octonitric cotton, 9.5% + 90.5% ammonium nitrate, coal; 20% + 80%, stone. 4. Dinitro-benzol, 10% + 90% ammonium nitrate, stone.

A New Thames Bridge.—The only remaining inelegant bridge over the River Thames at London, England, is to disappear and be replaced by

a structure more suitable for so great a city. This is the Vauxhall bridge which connects the Pimlico district of Westminster with the Surrey side of the river. The present structure, erected in 1811, was originally intended to be a stone bridge of nine arches; but when the foundations and piers had been built, the contractors decided to make the spans of cast iron. Not only is the material used in the span unsuitable and uncertain, but the foundations are now giving way. The breadth of the bridge is quite inadequate for the growing traffic, being only 36 ft. between parapets. The new bridge is to be of steel and to cost \$1,800,000, and is to rival in elegance its neighbor the Westminster Bridge, which is 85 ft. between parapets.

Boring for Coal in the South of England.—At the half-yearly meeting of the South-Eastern Railway Company, held on the 21st July, Sir Edward Watkin stated that the boring for coal at Dover had been continued, and had been attended with considerable success; in fact, the principal mining engineer in Belgium had expressed his belief that the coal seams were part of the great Belgian coal field. The report which that gentleman had furnished on the inspection which he had made showed that the seams varied in thickness from 2 ft. 6 in. to 1 ft. 8 in. The mining engineer stated also that it was his opinion that at a lower depth they would find coal in thicker seams and of excellent quality. When they had found these thicker seams and had proved that there was a paying coal field which only wanted working in a proper way to yield a large quantity of fuel, the next thing would be to arrange the prices for the land and the royalties to the Crown. An expert had said that £40,000 would be required for the purpose of sinking a shaft to the richer seams below those already proved. When this came to be actually required, he (Sir Edward) should head the list with a fortieth of the capital, and he hoped all the necessary assistance would be forthcoming so as to develop this great coal field.

Petroleum Industry of Peru.—The petroleum industry of Peru has already attained considerable proportions. In 1888, 23 concessions were asked; in 1889, 36; in 1890, 97, and in 1891 the number rose to 613. Since then two English companies and two syndicates have been formed to buy these concessions. The workings are furnishing large quantities of oil, and, according to the *Journal des Mines*, they will soon not only be in a condition to supply the needs of Peru and the west coast of America, but also the demands of China and Australia. The most important works be-

long to Mr. de Peaggio, an Italian, who owns 54 concessions in Zorritor of 40,000 square metres each. At present he has 11 wells opened, which furnish 6,000 barrels per month to the refineries. The London & Pacific Petroleum Company has the largest refinery. The company owns a number of tank steamers, and has already sent a cargo of oil to China. This company in 1890 exported 1,100 tons of crude oil in tank steamers, 48,589 barrels of kerosene and 4,000 barrels of lubricating oil.

The exportations of the Zorritos district in 1889 and 1890 were:

	1889. Kilos.	1890. Kilos.
Crude oil.....	2,131,874	2,324,219
Kerosene.....	999,658	1,999,161
Lubricating oil.....	457,799	1,115,677

Balland's Experiments on the Solubility of Aluminum.—During the latter part of 1891 Messrs. Lubbert and Roscher, of Germany, announced that aluminum was attacked by wine, alcohol, coffee, tea and other substances and in consequence aluminum should not be used for dinner pails or other household utensils or for canning fruits. M. Balland, in a communication to the *Journal des Mines*, states that he has made an extended series of experiments on the subject, the results of which are at variance with those obtained by Lubbert and Roscher. The metal used by him was the commercial sheet aluminum of France, having a thickness of 1 mm. and weighing 27.75 grms. per square decimetre. For each experiment 5 grms. were taken, measuring 18 sq. cm., giving a total exposure of 38 cm., counting the edges. The pieces were well cleaned before being subjected to the action of the various liquids. The aluminum was subjected to the action of air, water, wine, beer, cider, coffee, tea, milk, oil, butter and saliva, with the result that these substances exert less action on aluminum than on the ordinary metals such as iron, copper, lead and zinc. He found that vinegar and salt solutions attack the metal, but not in such proportions as to prohibit its use. In vinegar the loss after four months amounted to 0.349 grms. per decimetre of 27.75 grms. or but 1.25%; in 50% salt solutions the loss was only 0.045 grms. or 0.16%. The aluminum used contained 3% of impurities (iron and silicon), which, according to the experimenter, assisted the action of the dissolvents. The researches of M. Balland agree with those of Messrs. Lunge and Schmid, mentioned in the *ENGINEERING AND MINING JOURNAL* of February 13th, 1892.

NOTES ON SAMPLING.*

By Herbert R. Wood, M. A.

Vein and Mine Sampling.—Vein outcrops rarely assay up to the average value of the vein and it is therefore necessary to sample more than the outcrop, even at the first survey. A prospect, or first sampling, should be made from a series of pits, dug at intervals along the vein, to a depth of 10 to 12 ft. If the vein is much decomposed on the surface, however, the samples obtained in this way cannot be taken as characteristic of the lower parts of the vein. The depth to which the pits need be made varies also with the nature of the ore. If the surface croppings consist of iron oxides and carbonates of low assay yield the ore body in the form of sulphides will be reached at a less distance than 10 ft. Gold bearing veins are frequently richer near the surface, and the gold is apt to appear here in the form of large agglutinations, though at the immediate outcrop the gold may be entirely removed. When gold accompanies iron pyrites, the ferrous sulphate formed by the oxidation of the iron pyrites acts as a slight solvent of the gold, and removes it or washes it out, or deposits it in nugget-like masses.

The sampling of a mine for buying or selling purposes should be done at all the levels and in the shaft as well. When the ledge is exposed at the end of the tunnel, or at the bottom of the shaft, it should be sampled all over the face; when the tunnel follows the ledge, the vein should be sampled from wall to wall, across the roof and the floor, every ten or twenty feet; in the shaft the vein should be sampled from wall to wall on both sides, every fifty feet. Pay streaks when distinctly marked from the rest of the vein might be separately sampled. When the ledge is decomposed on the surface, careful sampling should be made from wall to wall as usual, and marked variations in ledge matter should be kept separate.

Dump Sampling.—The sampler may be blindfolded while he picks up from the pile of fragments of vein and ore with which his hand comes in contact; or the pile may be sampled by a careful selection from its surface. Car samples may be taken in the same way. None of these methods is very accurate and the only satisfactory way is to ship 5-10 tons of ore to a mill or smelter, where a good commercial average assay can be obtained. Such a car load should be taken from all portions of the vein.

Sampling Slags.—It is better to sample slags while they are hot and fluid. A slender iron rod, a portion of which is bent at one end to serve as a handle, is thrust into the red hot slag and quickly withdrawn, and instantly placed in a bucket of water. The thin scale of slag coating the end of the rod falls into the water. Where the slag is run in pigs on the ground as from matte reverberatory furnaces, the slag must be broken before too cool, and the rod thrust into its center. When the slag is run into pots a small iron cup with a long handle may be used instead of the rod; the surface of the slag in the pot is broken and the cup thrust into the molten fluid, care being taken that all the particles of matte suspended in the slag be first allowed to settle. The slag in the cup should be cooled slowly, and on breaking should present a glassy appearance. Slag may be sampled when cool, several pieces being broken off from it, but this method is more inconvenient, and is not so representative of the quality of the slag. Surface samples should not be taken, as bits of coke or flux are apt to adhere.

Matte.—In sampling matte the cup should be used; the slight crust which has formed on the pot should be broken and the cup thrust well in, as there is frequently some slag on the surface. If, however, the pot is full of matte, it is not advisable to thrust the cup to the bottom, as speiss is very apt to be present. The sample is cooled by dropping it into a bucket of water. Where the matte is run into a mold as in copper reverberatories, the matte is sampled by breaking small chips from the center and one end of the pig.

Zinc Pots.—The following is the method of sampling the zinc pots in the desilverization process: After the final zincing and the last alloy of zinc, a rich silver-lead is skimmed from the surface of the pot; and a long-handled pair of tongs having a cavity in each tong, which when closed resembles a bullet mold, is thrust into the pot by the workman, worked back and forward until heated, then suddenly closed, drawn up and opened on a clean board or flagstone. This is the method of sampling the bottom of the pot, and two bullets are usually taken. The upper portion of the pot is sampled by quickly thrusting in and quickly withdrawing a thin short bar of steel, rounded at one end; a thin coating of lead will adhere which can be readily removed by slitting one side. These samples will vary slightly '10, '08. The lower portion of the pot usually runs a trifle lighter than the surface sample, though the workman can usually tell by the nature of the last alloy removed, its crystalline structure, etc., whether the silver is all taken out.

Bullion.—The bullion direct from the blast furnaces is sampled with a punch hammer, which removes a core from each bar. These cores may be duplicated by one from the middle of the bar and one from the end. When pure refined or test lead is manufactured, the desilverizing process is continued till the lead assays .005 or less silver to the assay ton. This requires a repetition of the zincing process, and a re-sampling after each removal of the zinc alloys. The sampling is performed in the same way, however, but the assayer uses two assay tons from the top and bottom of the pot, which he first scorifies and then cupels. These should be taken, melted down in a pot by a moderate heat in a wind furnace and the contents poured into a mold. This may be done at the close of a month's run. The bar has a piece chiseled from the end and across the middle. This is rolled out with a hand roller to a ribbon the thickness of sheet lead, and with shears, cut across into the strips, then again cut across into small squares. These squares are mixed up, and two assay tons weighed out and scorified and cupelled. Usually it will be found that the middle of the bar runs a trifle higher in silver than the end.

Blast Furnaces.—The furnaces are sampled at the lead wells, the anti-monial and copper oxides brushed off the surface and a little lead poured on to a flat cold sheet of iron near by.

Softening Furnaces.—The softening furnace is sampled in much the same way; the surface is cleaned and the sample poured on the flagstone pavement near the furnace.

Cupels and Silver Furnaces.—In sampling cupels, the surface oxide is

brushed away and a cup thrust in and the contents poured upon a clean portion of the hearth. In silver furnaces the bar or poker end, after being cleaned, is quickly thrust into the molten silver, coated, and knocked off on the hearth. The sample should be taken from a portion of the bath on which there is no trace of lead oxide floating. In sampling the silver while it is being poured into the mold, a portion of liquid silver from the ladle is dropped at intervals into a bucket of clean water. If the ladle is held high and carefully shaken, the silver will be granulated. After each sample has been thrown into the water, the bucket should be cleaned and refilled.

A Parisian Underground Railway.—An underground tubular electric railway from the Bois de Boulogne to the Bois de Vincennes has been sanctioned by the Municipal Council of Paris. The tubular tramway will be constructed of metal. As the tunnel is driven ahead cast iron plates will be bolted together, forming a solid and durable wall. To check oxidation on the outside surface of the metal tube, each plate is provided with a hole in the center, through which mortar will be forced by hydraulic pressure, so as to fill up every nook and crevice. The motive power will be generated at a central station.

In the Future Telephone Wires Will Be Underground.—In speaking of the future of the telephone, Professor A. Graham Bell says:

"The telephone, as at present constructed, needs the open air to obtain the best results. To use wires placed underground, a metallic circuit will be necessary, similar to the one used now on long distance lines. To place the wires underground and to make a metallic circuit, which means to use two wires where one is used at present, will materially increase the expenses of the company, and the public must pay for the luxury. As the number of wires is increasing rapidly, it is evident that they must ere long be buried."

Proposed Manufacture of Cordite in Warm Climates.—The manufacture of cordite, the new smokeless explosive adopted by the English Government, will have to be carried out in warm climates under peculiar conditions. It appears that the materials composing it cannot be handled safely in a temperature exceeding 60°. As for many months in the year the thermometer in these countries ranges well over 100°, it will be seen that artificial means must be employed to keep down the heat in the mixing-room. To accomplish this it is proposed to have refrigerating chambers of the kind employed on large passenger steamers. This will insure safety in the handling of the materials, though it has to be seen whether the men employed in the manufacture can stand the rapid changes of temperature.

Action of Carbon Monoxide Upon Iron.—An article by M. Guntz on this subject appears in the *Bulletin de la Société Chimique de Paris*. The author states that Stammer, Deville, Lowthian Bell and Schutzenberger have observed that carbon monoxide is decomposed by iron, with deposition of carbon. Carbon monoxide, though very stable at high temperatures, is easily decomposed under the influence of oxidizable substances. If we take a pyrophoric iron obtained by igniting the oxalate, the action of carbon monoxide is the same, but less intense, as the metal has been reduced at a higher temperature. This reaction explains why in a certain zone of the blast furnace spongy iron meeting carbon monoxide is oxidized, yielding carbon and ferrous oxide, while in another zone this oxide is reduced by the carbon monoxide to yield iron and carbon dioxide, while, finally, in passing into the hot zones of the furnace, the iron in contact with finely divided carbon is easily oxidized.

The Mexican Vaso Furnace.—The Mexicans are wonderfully expert in constructing and operating these little furnaces. In their own country a small party of them will go to a mine in the wilds of the mountains, perhaps over 100 miles from any source of supplies, and with the material to be found on the ground will soon have a furnace going. To make the adobes required is the work of only two or three days, and by the time these are dry suitable clay and other refractory material for laying up and lining the furnace has been found. While the furnace is being built, one or two men are burning charcoal, and in a very short time they are making very transportable little cakes of bullion. In order to get a strong draft, these furnaces are built against a steep bank, and a flue run up the hillside. Though the first part of the flue is of adobes, the upper portion is often of split timbers, daubed with clay and covered with dirt. If the draft is not sufficiently strong at first, they soon remedy the defect by adding to the length of their flue. They are such experts at refining that they bring out small cakes of bullion that are almost pure silver. As early as 1863 they had in operation many of these adobe furnaces down near Owens Lake, Cala, in the Cerro Gordo mines. There they had some large furnaces working silver lead ores.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

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

TUESDAY, AUGUST 9TH, 1892.

- 480,265. Valve for Oil Wells. Horace D. Jones, Knapp's Creek, N. Y.
 480,286. Generator for the Vaporization of Liquids. Leon Serpollet, Paris, France, Assignor to La Société des Générateurs à Vaporisation Instantanée (Système Serpollet), same place.
 480,301. Ore Concentrator. Charles B. Walker, Trinidad, Colo.
 480,311, 480,312. Process of Desulphurizing Oils. Otto P. Amend, New York, and Josiah H. Macy, Harrison, N. Y.
 480,332. Steam Power Stamp. Charles A. Marlitt, Portland, Ore.
 480,336. Amalgamating Apparatus for Crushed Ores and Like Reduced Bodies. William W. Fyfe, London, England.
 480,405. Process of Treating Ores Containing Hydrated Sesquioxide of Iron. Clemens Jones, Easton, Pa.
 480,416. Art of Desilverizing Argentiferous Lead. Heinrich Roessler, Frankfurt-on-the-Main, Germany. Assignor of one-half to Bernhard Edelmann, same place.
 480,418. Mining Machine. Frank W. Syler, Columbus, O.
 480,432. Ingot Extractor. John F. Lewis, Turtle Creek, Pa.
 480,445. Aluminum Alloy. Christopher F. Whitney, Newton, Mass.
 480,491. Electrolytic Cell. Elisha B. Cutten, New York, N. Y. Assignor, by mesne assignments, to the Union Chemical Company, of New Jersey.
 480,492, 480,493. Method of Electrolytically Producing Potassium Chlorate. Elisha B. Cutten, New York, N. Y.
 480,647. Quartz Crusher. Andreas P. Anderson, Oriental, Nev.
 480,689. Smelting Furnace. John S. Oliver, Brooklyn, N. Y. Assignor to John Brooks, Boston, Mass., and the Oliver Aluminum Company, of West Virginia.

* From the *School of Mines Quarterly*, July, 1892.

PERSONALS.

Mr. T. A. Rickard, mining engineer, of Denver, Colo., is at present in New York, and will remain here for a few weeks.

Mr. Alexis Janin, Mining Engineer, of San Francisco, was in this city during the week en route to Europe, where he will make a short stay.

Prof. C. R. Van Hise has been elected to fill the chair of Geology at Madison University, Wis., recently occupied by Prof. R. D. Salisbury.

There are letters at this office, sent in our care, for Mr. Edward Roger, Mr. Hawthorn Hill, Mrs. Henry L. Chase, and Dr. Krause Cothen.

Mr. John B. Law, superintendent of the Pennsylvania Coal Co.'s mines at Pittston, Pa., has resigned. Mr. Anthony Horau has been appointed in his place.

Mr. Edward Kidwell, Instructor of Mechanical Engineering at the Michigan Mining School, now has charge of 18 students of the school engaged in practical shop work.

Mr. John A. Church, mining engineer, who has just returned from an examination of the Pioche mines, goes to Northern California in a few days on professional business.

Mr. Gardner F. Williams, general manager of the De Beers Consolidated Diamond Mines, of South Africa, has been in this city during the past week, but has left via Europe for Kimberley.

Mr. Arthur L. Pearce, mining engineer of the firm of Bainbridge & Seymour, of London, has been in the city en route to Europe, after spending several years in professional work in Peru.

Mr. E. E. Olcott, mining engineer of this city, has finished his examination of the mines and properties of the Pioche, Con. Milling and Refining Co., Nevada, and left for the Ferguson district, south of Pioche, which he will examine before his return.

Mr. C. F. Meek, President, and Mr. Thos. E. H. Curtis, secretary and treasurer, of the Colorado Coal and Iron Co.; Mr. Adolf Ladenburg, of Ladenburg & Thalmann, and Mr. John Scott, formerly President of the Colorado Midland R. R. Co., have returned to this city from Pueblo, Colo., where they went to confer with leading officials of the Colorado Fuel Co.

The mining agents who are to take an active part in the operation of the new mining law of Mexico have been appointed by President Diaz. Those who have received their commissions for the State of Sonora are given below: Hermosillo, Jose Encinas; Alamos, Manuel Alatorre; Moctezuma, Santiago B. Martinez; Guaymas, Alfredo Villasenor; Ures, Guillermo Echeverria; Altar, Ignacio Pesquerra; Arizpe, Jose Gandara; Magdalena, Ignacio Bonillas.

Mr. W. H. Perkin, Junior, Ph. D., F. R. S., has been appointed professor of organic chemistry at Owen's College, Manchester, England, the position being vacant owing to the death of Professor Schorlemmer. Dr. Perkin, though young, is one of the most distinguished chemists in England. His father has been connected with the chemical manufacture in England for many years, and he was the first to make colors from coal tar; not only has he been a leading manufacturer, but he is also an eminent scientist and discoverer. It is rare to find genius descend from father to son and still rarer to find father and son own the same initials both before and after their surname. Both father and son are W. H. Perkin, Ph. D., F. R. S., and son is distinguished from father only by the interpolated "Junior."

OBITUARY.

Gen. J. W. Denver, after whom the city of Denver, Colo., was named, died in Washington, D. C., on August 9th. He was born in Ohio in 1817, served in the army throughout the Mexican war, went to California, and was Secretary of State in 1852. Later he was made Governor of Kansas, from which he went to Colorado.

Sir Daniel Wilson, President of the Toronto University, died Aug. 7, from congestion of the lungs. He was born in Edinburg, in 1816, and was educated at the high school and university there. His favorite study was archaeology, and he acted for some time as Secretary of the Scottish Society of Antiquaries. He was also a fellow of the Royal Society of Edinburg.

Mr. A. Norman Tate, analytical chemist and chemical engineer, of Liverpool, England, died on the 22d July, in his 55th year. He made a special study of petroleum and his book, "Petroleum and Its Products," was translated into several foreign languages. He was one of the first to recognize the fact that an engineer's skill was necessary in the design and erection of chemical plants and in his capacity as consulting chemical engineer he did great service to the chemical manufacturers of England.

D. Eugene Maffei, of Ramos, Inspector-General of Mines of Spain, died in Madrid on the 13th of June. He was born Feb. 23, 1827, and in 1849 entered El Cuerpo de Ingenieros de Minas. In 1850 he was made an assistant on the geological survey of the

Asturias and in 1854 was promoted to the place of first engineer. In 1859 he became professor of mine working in the Mining School. After numerous other appointments he was made a mine inspector of the second class in 1881. In 1891 he was made a member of the geological survey of Spain. He published a number of works which are still standard works of reference in Spain.

W. H. Patton, formerly superintendent of the Consolidated California & Virginia and other Comstock mines, but more latterly of the Broken Hills Proprietary Co., of Australia, died August 6th in San Rafael, Cal. Mr. Patton, an excellent mechanical engineer, had made many improvements on the Comstock, the handsome surface works at the C. & C. shaft being after his design, and when the managing director of the Australian company came to America looking for an able superintendent, Mr. Patton secured the position with strong recommendations. He was given an opportunity to buy stock at a comparatively low figure in this and other companies and eventually made a large fortune, which, however, he was unable to enjoy through failing health.

SOCIETIES.

The annual meeting of the American Association for the Advancement of Science will be held at Rochester, N. Y. The meeting will begin on Tuesday, Aug. 16, and daily sessions are recommended by the council for the 17th, 18th, 19th, 22d and 23d of August, from 10 to 12 A. M., and 2 to 5 P. M. The meeting will be called to order by the retiring President, Prof. Albert B. Prescott, of Ann Arbor, Mich., who will introduce the President-elect, Prof. Joseph Le Conte, of Berkeley, Cal.

Before the meeting, the American Microscopical Society will hold its annual meeting, August 9, 10, 11 and 12, under the presidency of Prof. M. E. Ellwell, of Chicago, Ill.; and the Geological Society of America, on August 15 and 16, will hold its annual meeting under the presidency of Mr. G. K. Gilbert, of Washington, D. C. On the two last named days the Society for the Promotion of Agricultural Science, under the presidency of Prof. I. P. Roberts, of Ithaca, N. Y., and the Association of Economic Entomologists, under the presidency of Dr. J. A. Lintner, of Albany, will hold their annual meetings.

The annual convention of the Association of Edison Illuminating Companies opened at Toronto, Ontario, on Aug. 10. The meeting was absolutely secret. Secretary Jenks has stated that the reports of the standing committees were received and discussed, and particularly the importance of high insulation in the interior of buildings and the improvement of the safety fuses. The question of operating electric railway systems from lighting stations was introduced by J. H. McClement and William Lloyd Garrison, who gave an account of the pioneer incandescent and electric lighting plant, at Brockton, Mass. Mr. M. J. Sullivan, publisher of the "Street Railway Gazette" at Chicago, read a paper on "Central Station and Street Railways," and J. H. Vail a paper on "Application of New Apparatus to Secure Economy of Coal and Greater Efficiency."

Toronto, Ont., Aug. 11 (by telegraph).—The convention of the Edison Illuminating Companies concluded its session here to-day. The Edison and Thomson-Houston companies, hitherto rivals, have been consolidated, and arrangements made that the consolidation shall be applied to all cities in which the companies are working.

The following were chosen officers for the ensuing year: President, John J. Beggs, of New York; vice-president, Frederic Nicols, of Toronto; secretary, W. J. Jenks, of New York; treasurer, Wilson Howell, of Orange, N. J.; executive committee, C. P. Gilbert, of Detroit; C. L. Edgar, of Boston; E. R. Weeks, of Kansas City; W. D. Marks, of Philadelphia, and Samuel Insull, of Chicago.

INDUSTRIAL NOTES.

The Carnegie Steel Company's steel mill at Duquesne, Pa., has resumed work. The strike ended when the strikers returned.

The Lancaster Chemical Works, of Lancaster, Pa., were burned on August 10th, together with \$15,000 worth of stock. The building cost \$45,000.

A petition has been brought before the United States Circuit Court at Boston for an injunction under the Anti-Trust statute, against the General Electrical Company, restraining its patents.

The 800 employees of the Delaware Iron Works at New Castle, Del., have been notified of a 20% reduction in wages. The work only resumed on the 8th inst., after a suspension of six weeks.

At an official inquiry into the cause of an explosion on board a steam barge at Liverpool, England, the Board of Trade inspector gave it as his opinion that copper was not a suitable material for tubes in vertical boilers.

The fires in the West Superior, Wis., Iron and Steel Works were lighted on the 7th inst., and the works are in charge of the police. An attempt will be made to run the works with non-union men, under the protection of deputy sheriffs.

The Treasury Department has decided that so much of the act of March 3, 1883, as relates to

drawback on shale and bituminous coal was repealed by the act of Oct. 1, 1890, and consequently that no drawback can be allowed of the duties paid on imported coal, which may be subsequently shipped for use as fuel on a vessel.

The new Cunarders "Campania" and "Lucania," which the Fairfield Engineering and Shipbuilding Company, of Glasgow, are building, are rapidly approaching completion. The first of the two vessels will be launched in September, and the engines are already so far advanced that their fitting can be proceeded with immediately after the hull is launched. The second vessel and the engines are also being pressed rapidly forward.

Furnace F, at the Edgar Thomson Steel Works, at Braddock, Pa., which was recently repaired, is still out of blast, and furnace B of this plant is to be blown out. These two furnaces supply the Homestead Steel Works with pig iron, and as there is a good stock of pig iron on hand, the product will not be required for some time. The 500 men at the Isabella furnaces are out of work as a result of the strike at Duquesne. The Isabella furnaces supplied the Duquesne Works with pig iron.

The Wheeling Iron and Steel Company, composed of the La Belle, Renwood, and Tophill companies, and the Wheeling steel plant, will take formal possession of all the property of the four concerns on Aug. 8. The combined capital is more than \$8,000,000. The company will be the largest in the Ohio Valley next to the Carnegies. The projectors of the company state that the combine was made necessary by the efforts of the Carnegie Steel Company to crush its smaller competitors.

The Fort Payne Coal and Iron Co. has passed into the hands of a receiver, Mr. W. K. Sheldon, of Fort Payne, having been appointed to that position on Aug. 8. The bonded indebtedness of the company is \$227,000, and the floating indebtedness about \$125,000. Under the laws of Alabama, there is some question about the liability of the stockholders. So if the bondholders should take the property for the amount of bonded indebtedness, the stockholders might still be called upon to pay an assessment for the amount of the balance of the indebtedness.

Readers of the "Engineering and Mining Journal" were duly warned of this enterprise. The editor of this paper had examined and reported on the property.

Henry R. Worthington, of this city, has recently shipped to the Butte and Boston Company, of Butte, Mont., a compound condensing station pump. An interesting feature is, that the water end of the pump is composed entirely of composition metal; this being necessary on account of the chemical conditions of the water handled. The firm reports a large business in special pumps for mining sections. Each pump furnished for mining purposes demands peculiar construction as regards the metal used, capacity or structure, according to the head. The pump for the Butte and Boston Company has a capacity of 200 gallons per minute pumped 1,000 ft.

The British Postmaster-General has sanctioned the introduction of penny-in-the-slot machines for the distribution of postage stamps. On the insertion of a penny the machine delivers an envelope which contains a memorandum book, a sheet of writing paper and a penny stamp. The advertisements in the memorandum book are sufficient to pay for the book, envelope and paper, and to cover expenses and pay a dividend. No rebate is allowed by the government to the distribution company on the purchase of great quantities of stamps. A similar scheme is being floated in this country. Two 2-cent stamps and a card allowing a purchaser a rebate at the store of any concern advertising on it are given for 5 cents.

The Connelly gas motor for street railway lines in spite of its clumsiness is achieving some success in this country and in England. The street car carries a petroleum engine which drives a dynamo direct, and the current from the dynamo passes in parallel past accumulators to the motors on the axle. The amount of plant required on each car is really too great, viz., storage for petroleum, petroleum engine, dynamo, accumulators and motors. An ingenious variable speed gearing, however, is introduced between the motor and the driving axle, so that a greater power can be exerted at starting than during motion; thus the motor and machinery can be made much smaller than if they had to be depended on directly to start the car.

Commissioner Carter's annual report of the operations of the general land office for the fiscal year ended June 30 has been issued. The report makes the following comparisons: Total number of agricultural patents issued from 1885 to 1888, 162,754; acreage, 26,040,640; total number of agricultural patents issued from 1888 to 1892, 398,128; acreage, 63,700,480; total number of mineral patents issued from 1885 to 1888, 3,700; coal patents, 211; total number of mineral patents issued from 1888 to 1892, 7,354; coal patents, 685.

The report states that from 1889 to 1892, 8,425,398 acres of public land were surveyed, against 2,715,302 during the preceding four years. During the last fiscal year the cash sales aggregated 1,571,478 acres. The homestead entries amounted to 7,718,108 acres, and the railroad selections to 2,765,443 acres. Indian lands disposed of aggregated 97,456. The total acreage disposed of was 13,664,019. The vacant

public lands in the United States aggregate 657,586,783 acres. The commissioner recommends a liberal policy in reference to surveys of public lands, and says a general law on the subject of public forests is demanded which shall make adequate provision in respect to forest preservation and the cutting and removal of timber to supply public necessities.

The differences between the iron manufacturers and the Amalgamated Association have been amicably settled by mutual concessions, and the threatened strike of iron-workers in Pittsburg and the West has been averted. Fifteen mills will resume at once, and the other mills will start up as soon as necessary repairs can be made. This is the result of the conference of the joint committee of iron manufacturers and members of the Amalgamated Association on the 10th inst. By the terms of the agreement, the basis of puddling remains at \$5.50 a ton, but the men in the finishing department have been reduced 10%. There are a few minor concessions in the other departments, but just what they are cannot be learned yet. There was a hard fight on the puddling scale, but the manufacturers finally consented to pay the old scale, the workers conceding the reduction in the finishing department. While the settlement directly affects the 25,000 or 30,000 skilled workmen in the Amalgamated Association, fully 100,000 others are interested. The news of the signing of the scale was received with great rejoicing, not only by the mill workers, but every one in this neighborhood. The settlement only affects the Pittsburg district, but it is thought the manufacturers of the Shenango and Mahoning valleys and the West will fall in line and sign the scale.

Pittsburg, Penn., Aug. 11 (by telegraph).—Secretary Lovejoy, of the Carnegie Steel Co., Ltd., in speaking of the agreement between the iron and steel manufacturers of Pittsburg and the Amalgamated Association, which was signed on Aug. 10, said:

"This agreement both helps and hurts us. Our scale is almost identical with the scale proposed by the Amalgamated Association. There are one or two slight differences as to the division of the wages, but the cost to us is exactly the same as the scale of the Amalgamated Association makes it. This agreement will hurt us to the extent that we will have to pay 10 per cent. more in the finishing department than the manufacturers who sign the Amalgamated scale. They get the benefit of the 10 per cent. reduction in the finishing departments and we do not.

"This may also hurt us to the extent of stiffening the backbone of the strikers. It means work for thousands of men who are members of the Amalgamated Association and will enable them to pay increased benefits to the strikers at Homestead and our other mills. We see that result very easily, and it may further postpone the time when our old men will return to us for work, but it is only a question of time until all will want to come back.

"On the other hand the agreement to a reduction of 10 per cent. in the finishing department should help us. I think the fact that we pay 10 per cent. more in this department than other manufacturers should attract to our mills all men who are anxious for good wages, and I believe that will be the result. The fact that the many idle men in Pittsburg will soon be at work does not have any bearing on the Homestead mill, because the men whom we have there, and who are coming, did not come from Pittsburg, but outside of the city, and are not affected by any agreement between the workers and manufacturers of this district."

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

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

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

No charge will be made for these services.

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

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.

Goods Wanted at Home.

2,752. Equipment for the manufacture of electrical specialties. Kentucky.

2,753. Water pipe for 100 coke ovens, coke oven valves, mixed car, 20 and 30 lb. rails, and a 25,000 or 30,000 gallon water tank. West Virginia.

2,754. Sixty tons 16-lb. steel rails. North Carolina.

2,755. An engine lathe 16x12, screw cutting; a drill press back geared to drill to center of 24 in.; also stocks and dies for general jobbing shops. Virginia.

2,756. Locomotives, cars 56-lb. steel rails, splice bars, bolts, etc., for 23 miles of railroad. Alabama.

2,757. A handpower punch and shear that will punch and cut 3/4 in. and a pair of rollers 6 in. in diameter and 62 in. between housers. Louisiana.

Goods Wanted Abroad.

2,758. An incubator. West Indies.

GENERAL MINING NEWS.

ALABAMA.

Cherokee County.

(From our Special Correspondent.)

A suit involving title to the Baker Hill Brown Hematite Ore bank, which is undoubtedly the most extensive deposit of brown ore in Alabama, was tried at July term of District Court. The litigation was between National Bank, of Augusta, Georgia, plaintiff, and Tecumseh Iron Company, defendant. The plaintiff sued for title and possession on the claim that the property was purchased on a tax title in 1875 by the Stonewall Iron Company, who transferred to the plaintiff without, however, giving actual possession. The Tecumseh Company purchased the bank from General Warner, formerly of Baker Hill Iron Company, as President, whose title with possession dated back to 1866. When brought into court recently, both parties were ready for trial, having about sixty witnesses in attendance. The result was a nonsuit against plaintiff, whose agent says the case will be carried to Supreme Court. The bank has been producing for the past two years from five to six thousand tons of brown ore each month, and before that time a large quantity of the ore was used at the furnace of the Tecumseh Company; but as that company was manufacturing ear wheel iron, and this ore carried too much phosphorus, the use of it was discontinued, until the Tennessee coke furnaces commenced to use it; since which time it has been worked systematically and successfully.

ALASKA.

The Sumdum group of mines, reported on first by G. W. Garside, and afterward by F. J. Carrell, has been sold at a large figure.

(From our Special Correspondent.)

The new transportation facilities being provided this season will have the effect of making the mines in the Yukon basin more productive. Hitherto miners have been in the habit of starting early in the spring through the Chilkoot Pass over the Coast range, having Indians to carry their supplies. The charge for passage was \$15 per hundred, and necessarily supplies had to be cut down to the lowest limit. After reaching the lakes transportation down the Yukon was made by boat. Allowing time for the return journey, only a few weeks were left for work in the mines. Some of the bolder miners went into the Yukon in the fall, and wintered there so as to be on hand in early spring, but as supplies were so difficult to obtain, and machinery out of the question, all work was heavily handicapped. All this is now to be changed. There are three small vessels now on the stream, but as their capacity ranges only from 10 to 25 tons, they are not of very much use. A new steam vessel is to be put on, to connect at St. Michaels, and as she is 175 ft. long, with 29-ft. beam, and a carrying capacity of 250 tons, there is every reason to suppose that mining in this quarter will receive an impetus. She will leave at the end of August, and dispose of goods at the various camps, and when the head of navigation is reached (the Yukon is really navigable for 2,000 miles), she will be lifted out of the water, machinery being carried along for that purpose, and the winter passed on the upper Yukon. Next spring she will make three trips up and down the river. The Yukon mines are in many instances very rich, the placers particularly so, and the \$70,000 taken out in the season will most assuredly be largely increased next year.

ARIZONA.

Mohave County.

(From our Special Correspondent.)

A group of 13 mines in what is known as the secret Indian district, belonging to Judge H. Shafer, of San Francisco, G. M. Bowers, and J. P. Bennett, of Kingman, have been sold to Judge F. T. Baldwin of Stockton; B. F. Sanford, of Lodi, and P. Reddy, of San Francisco. The mines give promise of great richness, and the transfer of \$20,000 was made this week on account of the purchase.

Pima County.

The Quijotoa mining companies report having had cash on hand Aug. 1st, as follows: Peer, \$162.09; Peerless, \$529.12; and Crocker, \$1,250.86.

Yavapai County.

Hillside.—Work at these mines is proceeding with highly satisfactory results. A new vein was encountered in the lowest level, and assays have shown the ore to be exceedingly rich. The north end, under the Seven Stars' claim, of the No. 3 level, has been advanced 135 ft., all in ore, in six weeks. This was the work of one man per shift, and yielded over 200 tons of excellent ore. At Discovery Point a drift is advancing in a 2 ft. lode of ore, averaging 7 oz. of gold and 80 oz. in silver; selected ore yielding 14 oz. in gold, and 380 oz. in silver. A cross-cut has been started to prospect the ground lying between the main lode and the granite. Several veins are known to exist in this part of the property. The mill is kept at work night and day.

CALIFORNIA.

Mono County.

The following are the financial statements of the various Bodie mining companies, showing assets on Aug. 1st: Bodie, \$16,584; Bulwer, \$7,575; Mono, \$4,875; Standard, \$39,932; Syndicate, \$1,518.

Bulwer Consolidated Mining Company.—The latest official weekly letter says that 166 cars of ore were extracted and put into the main ore chute. The ore stopes continue to yield fair-grade ore. The mill has been kept running steadily, and the average battery samples are \$26.23, tailings \$8.77.

Standard Consolidated Mining Company, Bodie.—This company's product of bullion for July amounted to \$15,600.

Summit Mining Company.—According to the latest official weekly letter, this mine is being exploded energetically on and above the 200 level, and quantities of good ore from the small veins encountered, while prospecting, are saved for future milling.

(From our Special Correspondent.)

Bulwer Consolidated Mining Company, Bodie.—A report is current here that a very much better showing is being made in the mine than is allowed to transpire through official sources. The ore stopes are yielding steadily ore of very good grade, and in other parts of the mine there are reserves not being now drawn upon. Last week 166 cars of ore were hoisted, the battery samples of which ran \$26.23 per ton; the tailings \$8.77.

Standard Consolidated Mining Company, Bodie.—A shipment of bullion, valued at \$15,600, has been received from the mine at San Francisco, this being the product for the month of July.

Placer County.

Gray Eagle, Forest Hill.—A good strike of blue gravel has been made in this mine. At present the workings are in over 90 ft. on the gravel and have not yet cut through. Ore assaying as high as \$1,000 per ton has been extracted, and the mill was started up crushing ore on the 1st inst.

Sonoma County.

(From our Special Correspondent.)

Despite the fact that the quicksilver industry has not been very prosperous, interest here has somewhat revived. The Crystal mine, near the Pine Flat region, has been bonded for \$6,000, and several mines abandoned long ago are being reopened, and work vigorously carried on.

The Cinnabar King Mining Company, Healdsburg.—A vein of cinnabar has been struck, which has revived the hopes of the stockholders, as it assays well.

COLORADO.

M. E. Smith, assayer of the Denver mint, has just published his report of that institution for the year 1891, in which he makes the total value of the output for the Colorado producers for the year \$35,967,390, the mint estimating it at the coinage value \$1.29 an ounce instead of the average price in the market, which was \$0.9855 for that year and on that basis gave a total of \$33,548,934. In the list of producers mentioned in the report from Pitkin County are the following, the total valuation of the product as registered at the mint being \$9,483,978:

	1889.	1890.	1891.
Aspen Con.....	\$2,782,923	\$19,404	\$1,909,666
Aspen M. & S. Co.....	1,271,036	873,445	814,398
Compromise	1,674,715	1,148,629	1,063,197
Durant	61,455	138,912	78,059
Enterprise	304,459	.....	80,815
Park-Regent.....	558,730	332,411	347,233
Mollie Gibson.....	166,968	.....	2,667,566
Edison	404,829	183,642	94,381
O. K.	50,993	100,746	54,172
North Star.....	83,928	25,127	.....
Franklin	332,352	20,537	.....
Last Dollar	155,151	258,586	236,400
Standard	169,957	.....	486,170
Bushwhacker .....	.....	193,005	136,404
Camp Bird .....	.....	179,508	65,937
Celeste .....	.....	82,412	15,514
Good Thunder .....	.....	79,100	161,612
Justice .....	.....	113,092	15,592
Little Rule.....	10,606	71,515	.....
Percy Con.....	42,666	53,941	72,402
Smuggler	42,434	372,979	506,140
Aspen Contact.....	.....	.....	133,310
Connemara .....	.....	.....	214,110
Lottle .....	.....	.....	135,754
Late Acquisition .....	.....	42,650	53,060

The same report places the output of Lake County at \$8,286,876, with Ouray next in the column at \$3,598,749. One hundred and twelve mines are credited with the production of lead, 6 copper, 97 gold, 189 silver and 209 both gold and silver of the value of \$500,000 and upward.

Boulder County.

Boston, Ward.—It is reported that this mine has been sold to an Eastern syndicate for \$100,000. The new company will be known as the Boston Mining and Milling Company.

Clear Creek.

A total of 66 cars of ore were shipped from Silver Plum during July. Of these 22 were from the Stevens mine and were loaded at Graymont; 23 cars were shipped from the Mendota, 1 car from the Cashier, and 1 car of concentrating ore from the Pelican; 21 cars of concentrating ore were shipped from the Seven-Thirty. The Dunderberg was prevented from shipping much, the tunnel being filled up when the washout occurred. In addition to the

above shipments, a large amount of ore was hauled to Georgetown by wagon from the Pelican, Pay Rock, Seven-Thirty, and other lesser producers, making a large output for the month.

El Paso County.

Anaconda Gold Mining Company, Cripple Creek.—This company has commenced operations on the great tunnel which it is driving into Gold Hill. A special effort will be made to push work in the tunnel as speedily as possible. A large force of men will be put to work on the other valuable properties of the company. A whim is now being put in place on the Excelsior, which was showing up well when the litigation between the old Anaconda and the Work companies caused operations upon it to be suspended. Ore shipments have been resumed and will be gradually increased.

Red Bird, Cripple Creek.—A strike is reported in this property owned by Farris, Vivion & Co. The mine is not a new discovery, and good ore has been taken from it in the course of development. The present strike was made at a depth of less than two feet, in a new shaft.

Lake County.

The following items of Leadville mining news are extracted from our exchanges: It appears that at last the "city" mines are to be able to cope with the water. The Sixth St. and Bohn properties are now at bottom again, while the Penrose, if nothing unforeseen occurs, will reach bottom this week, when sinking will at once be resumed. There are now eight teams kept busy hauling the ore from the Only Chance mine. This property is shipping 100 tons per day of 100-ounce ore. The Florence is coming to the front, and about three tons per day of good grade gold ore is being mined. The Henrietta and Maid management is developing an immense amount of new ground, and, at the same time, shipping 100 tons per day of copper sulphides. The Wolfstone is now successfully handling the water which troubled the management so long. The daily output averages 100 tons. Lessees recently encountered a very good streak of ore in the Chadbourne property. The general outlook for the Weston Pass mines is most excellent. This is a comparatively new district, and the miners have been working under great difficulties.

Bi-Metallic Smelting Company, Leadville.—This company's new smelter blew in on the 30th ult. The company purchased the old La Plata plant, and repaired it thoroughly. Messrs. D. H. Moffat, of Denver, Eban Smith and Franklin Ballou, of Leadville, are the principal members of the company. Mr. Ballou is the general manager, W. H. Nutting, superintendent, and J. C. Wigginton, secretary. The ores to be treated by the new smelter are sulphides, copper and iron pyrites, together with the required quantity of silicious ores necessary. But one furnace will be used, of a capacity of 100 tons per day. It is the intention to employ about 60 men.

(From our Special Correspondent.)

Emmons Consolidated.—A new 80-ton stamp mill is going up at the Emmons, in Horseshoe, and is to be completed by October 1st. This mill will be connected with the mine by a tramway, one mile in length, which will also be completed about the same time. A large quantity of ore has been blocked out in the Emmons workings, all of which is of a fine milling class, besides several thousand tons which are now on top waiting until the mill is completed for treatment.

First National Mining Company.—This property has been under bond to a number of Eastern capitalists for some months past. It has now been taken up, and operations are to commence at once.

Grey Eagle Consolidated Mining Company.—The Sixth Street, Penrose and Bohn shafts have been pumping steadily of late, the former having succeeded in reaching bottom twice within the past two weeks. An accident to the pump upon the first occasion compelled a cessation of operations for a few hours, but little or no trouble has been experienced since that time. The water in the Sixth Street is now held at the bottom while a new pump station is being cut, into which will be placed a powerful duplex pump in order to meet possible emergencies in the future. The shaft, since striking bottom, has been carried down 4 ft., and but 7 to 8 ft. remain before the ore body revealed by the diamond drill over a year ago will be reached. The Penrose and Bohn shafts have almost succeeded in reaching bottom, and will eventually do so sometime during the ensuing week.

Hoosier & Campbell Mining Company.—This company is about to resume operations, and a large amount of money will be spent in development. It is understood that no attention will be paid to the old workings, and that the contemplated development will be done from a new shaft.

Huckleberry Mining Company.—A new strike of mineral overlying 21 oz. silver per ton has just been made at the Huckleberry, at St. Kevin. This mineral was found in a vein 18 inches wide and only 6 feet from the grass roots. It was opened up in an upraise from the 70-foot level, which was carried upward 50 feet. The vein pitches downward into the hill abruptly and has given indications of enlarging, although having been followed but 7 ft. up to date.

Maid-Henriett Consolidated.—The copper sulphide chute in this ground is now producing an average of 1,000 tons daily, and a large force of men is em-

ployed. The output is to be increased monthly to probably 150 tons per day. Large bodies of low grade ore have been opened up recently in the lower workings, but these cannot now be properly developed, owing to the depression in the price of silver.

Pawnoles Mining Company.—A strike was made last Saturday at the Pawnoles, on the north side of Big Evans gulch, which is one of the most important made here for some years, inasmuch as it proves, beyond doubt, the continuity of the ore belt from Carbonate hill, through Yankee and Fryer hills, and under Big Evans gulch to Prospect mountain beyond, thus opening up an entirely new district for prospectors. The strike was made 70 feet northeast of the shaft in 230-foot level, and consists of a large body of fine iron silver ore.

Small Hopes Mining Company.—An immense amount of fine carbonate ore is being shipped daily by this company from the Emmet deep shaft workings. This is produced from a point near the Gonabrod line, in a drift 700 feet in length run from the Emmet shaft. Sinking has not yet been commenced to reach a depth corresponding to that at which the big sulphide chute was encountered some time ago by the diamond drill, and it will not be started yet for a short time, or at least until the Gonabrod chute has been more thoroughly developed.

Valley Mining Company.—An incline has been started 70 feet northeast of the Valley shaft on the Opulent ore chute, which was encountered recently in the Valley property at a depth of something over 100 feet. This incline has now been driven 30 feet, but in that short distance proves that the chute on its way back to the shaft pitches abruptly into the hill. Regular shipments are being made, the ore averaging 250 ounces silver per ton.

Pueblo County.

Colorado Coal and Iron Company.—It is reported that President Osgood, of the Colorado Fuel Co., has already assumed practical control of the affairs of the above named company. June earnings show an increase over those of 1891, and the month of July is expected to show a still larger advance.

San Miguel County.

Shipments of ore and concentrates from Telluride from January 1st to August 4th, amount to 20,675 tons. For the week ending August 4th the shipments aggregated 616 tons, divided as follows: Smuggler Union, 264 tons; Sheridan Consolidated, 330; Hector Mining Co., 11, and Bryarly, 11.

Summit County.

During the month of July there were shipped from Breckenridge 58 carloads of ore and concentrates amounting to 771 tons against 225 tons for the same month last year and making for this year from Jan. 1st to July 31st, 3,948 tons against 3,030 tons for the same period last year, a gain for 1892 of 918 tons.

IDAHO.

Kootenai County.

Hendryx Smelter.—The smelter at Pilot Bay is being constructed as fast as possible, the buildings for the furnaces and power house are now nearly completed.

Kaslo-Slocan District.—According to the Spokane "Review," regular shipments will soon be made. The Slocan star tunnel is now in 50 ft. and is entirely in ore. There are 200 tons of assorted ore on the dump. On the Payne the vein averages 20 ins. in width. The Mountain Chief vein is 30 ins. wide. The mines in the vicinity of Kaslo are also doing well. The Lucky Jim, bonded to Seattle parties, is turning out ore of 60 oz. silver. On the Blue Bird, which has been bonded by Jim Burke and others, the vein is increasing in width with depth. Kaslo City has subscribed \$8,500 for a wagon road to the mines.

Owyhee County.

Blaine Tunnel.—The tunnel is in 1,475 ft. Stopes are turning out some very good ore. The ledge here is wide. Some of the ore assays \$400. The milling ore assays, silver \$70.40, gold \$16.

Trade Dollar.—In tunnel No. 3 the ledge is 18 in. wide on the footwall, assay value, gold \$2, silver \$37.60. Stope looking well. The ledge between walls is 3 ft., with from 10 to 16 in. of high grade shipping ore. Winze D is down 80 ft. The ledge is 8 ft. wide, 3 ft. of good milling ore. Drift ore from D is in good ore, 3 ft. of which assays, gold \$2, silver \$82.30. Three cars of ore (60,527 lbs.), were shipped to Denver last week. This ore is expected to run \$800 per ton, says the Idaho "Avalanche."

Shoshone County.

Boise City, Idaho, Aug. 12.—Judge Beatty yesterday imposed sentences varying from four to eight months' imprisonment in the county jail upon nine of the Cour d'Alene rioters, and discharged eleven of them.

Tiger Mining Company.—This mine, with the concentrator and store owned by S. S. Glidden, Spokane, has been attached by John M. Burke, for failure to pay a note of \$5,000. Glidden, it is said, offered a check in payment which was refused by Burke.

KANSAS.

Cherokee County.

During the week ending Aug. 6th, the output of ore from the mining districts of Galena and Empire City was: Rough ore, lbs. milled, 2,502,120; rough ore, lbs. sold, 2,065,040; zinc ore, lbs. sold, 778,300;

lead ore, pounds sold, 270,010. Sales aggregated a total value of \$14,870.

MICHIGAN.

Copper.

Calumet & Hecla Mining Company.—In the Red Jacket perpendicular shaft the Whiting system of hoisting has been adopted, and it is now satisfactorily working. The depth of the shaft is now 2,485 ft. It is expected to strike the Calumet & Hecla conglomerate at a depth of 3,300 ft., and according to President Agassiz's last report, the shaft will be sunk 5,000 ft. perpendicular to reach the limit of the Calumet property. According to the Torch Lake "Times," the 38th level, north of No. 5 Calumet, continues in a rich, wide lode. It is now estimated that there is enough rich ground opened up north of No. 5 to make a good mine.

Osceola Mining Company.—The mine is now fairly rich from No. 3 shaft to 150 or 200 ft. south of Opechee shaft, a length of over 2,000 ft. on the lode," says the Torch Lake "Times." "The last lift sunk in Opechee shaft disclosed a lode rich in copper, which shows that the end of the rich ground has not yet been reached.

Quincy Mining Company.—The monthly report of the superintendent of this mine shows a large amount of surface and underground work performed in July, the stopes varying from poor to rich. No. 4 and No. 5 stamps were almost ready to start when the report was written. The large new engine is running smoothly at the mill. Another connection with the Pewabic mine, underground, has been made. Quincy will have no apparent need to purchase the Franklin mine in order to work the Pewabic property.

Tamarack, Jr., Mining Co.—The company has ceased sinking No. 2 shaft at a depth of about 3,015 ft., and drifts are being opened on the lode, which is as yet unprofitable.

Wolverine Copper Mining Co.—The annual report of this company shows the financial condition June 30, 1892, as follows: Assets.—Cash, \$3,219.41; copper on hand, \$3,027.88; due on assessment, \$22,162.50; cash at mine, \$41.12; supplies \$2,159.72; fuel, \$5,225.20; total assets, \$35,835.92. Liabilities.—Loans, \$15,500,000; agents' drafts, \$1,854.19; indebtedness at mine, \$3,992.36; accounts payable, \$831.72; total liabilities, \$22,178.27; balance of assets, \$13,657.65. Receipts and expenditures from the date of organization to June 30, 1892, were as follows: Receipts.—From capital stock, 60,000 shares at \$10 per share, paid in at organization, \$600,000; less paid for real estate, land, buildings, machinery, dwellings, etc., \$550,000, \$50,000; from assessment No. 1, due Aug. 1, 1891, \$30,000; from assessment No. 2, due June 15, 1892, \$30,000; from copper, 500,074 pounds at 11.3 cts., \$56,514.13; from balance of interest account, \$268.69; Total receipts, \$166,782.82. Expenditures.—Expenses at mine, Aug. 1, 1890, to June 30, 1892, \$141,020.32; other expenses, salaries, etc., \$4,436.69; listing and registration of stock, \$1,139.25; Smelting, freight and other expenses of marketing copper, \$6,528.91; Total expenses, \$153,125.17; balance of receipts, June 30, 1892, \$13,657.65. The Wolverine began to produce copper Sept. 1, 1891, and continued production until April 7, 1892. In this period 41,880 tons of rock were hoisted, of which 31,524 tons were stamped, giving 584,109 pounds of mineral, which yielded 500,074 pounds of refined copper. The mineral ran 15.83 pounds per ton of stamp rock, and the fine copper 15.86 pounds per ton stamped, being .926% crude copper, and .743% refined copper per ton. The cost per ton of rock hoisted was \$1.45 and the cost per ton of rock stamped was \$1.93. This yield of 15.86 pounds of fine copper per ton of rock stamped compares with 27.92 pounds per ton in the Osceola; 21.21 pounds in the Kearsarge; and 49.74 pounds in the Tamarack, and 39.9 pounds in the Quincy. The Allouez got 12.92 pounds per ton, the Atlantic 12.3 in the years covered by their last annual reports. These figures are given to show the comparative richness of the rock in several of the prominent Lake Superior copper mines. The company suspended production in April and devoted attention to increasing the available stoping ground. It is now proposed to start another shaft and increase the air compressor capacity to provide for a minimum amount of ore stamped of 200 tons per day.

Tamarack, Jr., Mining Company.—The certificates of this company are stamped \$20 paid, which leaves a possible assessment of \$5 per share before par is reached. Latest advices are that No. 1 shaft south is rich. The lode in No. 2 has widened, but shows no improvement in grade. To the first of the month 108 ft. of drifts had been opened in No. 2.

Iron—Marquette Range.

Jackson.—No. 7 pit of this mine has closed down, the pumps have been withdrawn, and the chances are that nothing more will be done at this portion of the company's mine, says "Iron Ore." The ore deposit was irregular, bunched and expensive to mine.

Lake Angeline.—The water has now been lowered over 8 ft.

Lake Superior Iron Co.—The foundations are ready for the new machinery, which is now being placed in position.

Pioneer Furnace.—It is estimated that the Pioneer furnace, at Negaunee, which was blown out permanently a short time ago, had made 1,000,000 tons

of pig iron, which had brought at least \$25,000,000. It had been in operation forty years. During its existence its product had been sold from \$65 a ton all the way down to \$15, the present price. In its best days its average consumption of charcoal was the product of two acres of forest a day. From forty to fifty men were employed at the furnace, and quite a number of those there at the final blowing out had been steadily employed there from fifteen to twenty-five years. It wielded a great influence in the development of that region.

Iron—Menominee Range.

Ludington.—The company has discharged the remaining 60 men who were retained after the partial closing down of the mine some time ago.

Iron—Michigamme Range.

According to "Iron Ore," Mr. B. M. Colwell, the discoverer of the Beaufort, Titan and other mines on this range, found the continuation of the Champion formation, or the southern rim of the Range, for which he has been prospecting some time in Section 12, town, 47, Range 31.

MINNESOTA.

Iron—Vermillion Range.

Chandler Iron Co.—The steam shovel is now loading 125 cars daily and it is expected that the output this year will reach 600,000 tons.

Sheridan Iron Co.—Explorations have been discontinued and the men sent to the Mesaba Range.

MONTANA.

Deer Lodge Co.

Combination Mining and Milling Co.—The company is running full time with a large force of men. The mines have been extensively prospected and show large reserves of ore, says the Phillipsburg "Mail."

Granite Mountain Mining Co.—A number of miners were discharged from this mine during the week ending July 30, and on Aug. 1 the mill located at Granite was closed down and the force laid off. The cause for this action is not positively known. There are a number of theories in circulation, one of which is that the expense of operating it in comparison with the Rumsey mill is too great. Wood costs a good deal more in Granite than it does in Rumsey or Phillipsburg. Another and more probable report is that the ore deposits will not warrant the running of so many stamps—that future developments must be made before the mill be started again.

Puritan.—The owners of this mine, who have been shipping the ore to Tacoma, Washington, at an expense of \$400 per carload for treatment and freight, have leased the old Algonquin mill and are putting it in order.

Jefferson County.

Pilgrim's Progress.—This property is a blanket lead, and has been stripped a distance of 150 ft., showing from 2 to 6 in. of high grade ore running above 400 oz. silver. About 150 tons will be shipped to the smelters during September, according to the Butte "Inter-Mountain."

Lewis and Clarke County.

American Developing and Mining Company.—This company has bonded for two years the Sunlight and Golden group of mines, between Logan and Butte. According to the Montana "Mining Review" the mines are free milling, 28 assays averaging \$14 per ton.

Grand Republic Mining Company.—This company is producing about 6 tons of concentrates per 24 hours.

Overland Mining Company.—The company has made all necessary arrangements for developing the Overland mine. At present there is a 10 stamp mill on the ground, and this will be started immediately.

Meagher County.

Compromise.—In this mine, which is being worked on lease, a vein 10 in. wide has been discovered. The ore is said to be high grade, and a shipment will soon be made.

May and Edna.—At this mine workmen are engaged in raising on the ore body recently struck. They are now up about 20 ft. from the tunnel, and are taking out some good ore that assays from 37½ to 60 oz. of silver per ton. The ore bins are now nearly full, and the railroad anxiously looked for in order that work may be increased.

Queen of the Mountain.—In drifting north 1,500 ft. in on the tunnel, a vein was discovered on August 4th, showing a width of 12 to 20 in., assays of which run from 80 to 100 oz. silver and 30 to 50% lead. The vein has been followed for a distance of 15 ft., and it is still widening.

Wright & Edwards.—The contract work is nearing completion. By September 1st the shaft will be down the required 215 ft., and then a cross-cut of 40 ft. will be made to the vein.

Silver Bow County.

Anselmo.—At this mine work is progressing favorably, shipments of ore being made regularly. In the center shaft two shifts of men are employed. At the 200-ft. level some excellent ore is being obtained. At what is called the upper shaft on the property, timbering to the 200-ft. level was recently completed. At this level a lead of high-grade ore is being worked, and at the 100 level a number of men are engaged in drifting, says the Butte "Inter-Mountain."

Boston and Montana Mining Company.—The "Commercial Bulletin" says: "One who has seen the figures says that last year it cost the Boston & Montana 8.2 per lb. to produce its copper, including the construction works at the mines, but not that of the Great Falls smelter, for which special funds had been provided by mortgage. The product for the year aggregated 26,000,000 lbs., and the average price for the kind of copper produced by the Montana was 10¼ cts. The cost being 8¼, there was consequently a profit per lb. of 2½ cts. of \$650,000. Fixed charges, including the sinking fund, are about \$213,960, leaving 336,040 for the stock, not including silver, which yields a profit of about \$150,000. Call profits for the stock \$500,000 for the sake of convenience, and it will be equal to over 16 per cent. on the \$3,125,000 capital stock. The fact that no dividends have been declared, however, shows that this money must have been employed for some other purpose, for the new smelting works, in all probability."

Silent Treasure Mining Company.—It is reported that the mill will be ready in 10 days. A flume about 700 ft. long, to carry water which will furnish the motive power, is now completed. In the event that satisfactory results are obtained from the mill, a tramway to connect the mill with the mine will be constructed. This will be 1,700 ft. long, and up a steep hill. A small force is continually at work in the mine. It is a free milling ore, carrying about 14 per cent. iron.

NEVADA.

Elko County.

The following are the financial statements of the various Tuscarora mining companies showing the assets and liabilities on August 1st: Cash—Diana, \$452; Nevada Queen, \$7,246, with more bullion to be received; North Commonwealth, \$3,376. Liabilities—Belle Isle, \$7,295; Commonwealth, \$22,750; Del Monte, \$22,571; Grand Prize, \$5,663; Independence, \$259; Navajo, \$15,260, with \$7,800 due on pumping account, with proceeds of ore sales to be received; North Belle Isle, \$14,525, with proceeds of ore sales to be received.

Union Mill Company, Tuscarora.—This company shipped on the 2d inst. 13 bars of bullion valued at \$28,000, the product of the last cleanup.

Following are the latest official letters from the Tuscarora mines:

Commonwealth Mining Company.—East drift No. 5 chute advanced 20 ft., face is in ore assaying \$22.62 per ton. No. 1 raise, third level, has been put up 15 ft.; should reach the ore in about 10 ft. farther. Commence extracting ore on the 1st inst.

Nevada Queen Mining Company.—North immediate drift from No. 7 chute advanced 11 ft., showing bunches of ore. North drift from No. 6 advanced 15 ft., 2 ft. of \$50 ore in face of drift. North drift from No. 5 extended 18 ft., nothing of value in the face. West drift from No. 1 advanced 22 ft. in second-class ore. Stopes continue about the same. 68.61 tons of first-class ore worked at Union mill, battery assay \$272 per ton, and 248.6 tons sent to concentrating plant, battery assay \$24.62 per ton.

Esmeralda County.

Monte Diablo Mining Company.—Following is the latest official weekly report: In the immediate level, above the sixth, we have two stopes, and are taking out considerable \$40 ore. We are stopping from the east on the fifth level, but there is only a small bunch of ore there. The stope above the fourth, east, does not look so well, the ore being more mixed with waste. The stopes above the third west, show no change. The south cross-cut from the second east is in 135 ft., and the formation is very hard in the face. Are cutting out ground to make a chute above the second east, and shall resume work in these stopes in a few days. The stope above the second west is yielding a small amount of \$50 ore. The stopes above the third east are giving some \$30 ore. We will put on a number of men prospecting after the 1st of August. The mill is running nicely, and is doing good work.

Lincoln County.

Pioche Cons. Milling and Refining Company.—The corps of mining engineers and experts, headed by Prof. J. A. Church, who for six weeks past have been examining the various properties of this company, have completed their labors and withdrawn. The last to finish up was Mr. E. E. Olcott, who today left for Ferguson district, where he will examine the mines before starting for the north. Mr. Olcott's report on the properties here is full and exhaustive in every detail, and is believed to be a favorable one, says the Pioche "Record." It is said the examinations are made in the interest of the Consolidated Kansas City Smelting & Refining Company with a view to consolidation or outright purchase.

Storey County—Comstock Lode.

During July \$157,433 was paid out to employees by Comstock mining companies.

The following are the financial statements of the various Comstock mining companies showing the assets and liabilities on August 1st: Cash—Alpha, \$7,943; Alta, \$24,575, after deducting \$3,000, the balance due the Comstock Tunnel Company; Andes, \$15,536; Best & Belcher, \$2,149; Consolidated California and Virginia, \$441 in cash and \$26,532 in unsold bullion, with further shipments to arrive; Challenge, \$197; Crown Point, \$4,206; Caledonia,

\$5,489; Chollar, \$23,501; Consolidated New York, \$2,611; East Sierra Nevada, \$16; Exchequer, \$2,574; Gould & Curry, \$12,713; Julia, \$5,987; Kentuck, \$874; Lady Washington, \$6,456; Mexican, \$15,553; Occidental, \$7,961, with bullion and the proceeds of the sale of ore concentrates to be received; Ophir, \$20,738; Overman, \$616; Silver Hill, \$2,021; Segregated Belcher, \$6,278; Scorpion, \$152; Sierra Nevada, \$21,857; Utah, \$9,258. Liabilities, Belcher, \$420, with bullion shipments to be received; Bullion, \$7,854; Consolidated Imperial, \$116; Confidence, \$6,885; Hale & Norcross, \$9,001; Petosi, \$18,847; Savage, \$8,497, with bullion to be received; Union, \$684.

Challenge Consolidated Mining Company.—This company received \$1,596 as the proceeds of bullion sold during the month of July. It had \$197.28 on hand August 1st against \$2,266.94 on July 1st.

Consolidated Imperial Mining Company.—This company made a large reduction in its indebtedness last month. On July 1st, the company owed \$2,178.59, and afterward had to pay all of the June expenses. It received, however, \$4,000 for the sale of some old machinery, and also \$4,161.85 from the sale of bullion produced from small quantities of ore extracted in the upper levels of the mine, and the indebtedness was reduced to \$116.06.

The following letter from the President of the Hale & Norcross Mining Company is self-explanatory: "San Francisco, August 2, 1892.

Messrs. W. S. Wood and W. E. Miles, Savage Mining Company—Gentlemen: Your communication of the 28th of July, 1892, was duly received. Relative to the proposition therein embodied as to the purchase jointly of a quartz plant for the reduction of the ores of the respective companies, I will state that this company is not at present in a position financially to advance funds for any other purpose than the legitimate exploration of its property, and that when its mine shall have been developed sufficiently to warrant the renewal of ore extraction and the milling thereof, it would then be the time to consider your proposition. Respectfully,

Nat T. Messer, President Hale & Norcross Mining Company."

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

Mine.	Tons hoisted.	Car sample assay.	Tons milled.	Average bat. assay.	Bullion product for week.	Bullion shipped.	Bullion retained.
Con., Cal. & Va.	1008	26.82	980	25.05	.....	\$41,231.99	.....
Occidental	175	.....	175	22.35	.....	\$7,495.00	.....
Overman	278	.....	228	17.31	.....	\$9,337.63	.....
Potosi	437	27	473	21.39	.....	\$452 lbs.	.....
Savage	2604	21.35	525	21.52	\$7,750.42	.....	.....
Yellow Jacket	.....	.....	.....	.....	.....	.....	.....

1 Making total shipments on July account of \$70,969.75
 2 Seven bars of bullion to San Francisco of above value.
 3 Three
 4 Crude Bullion.
 5 Cars.

Occidental Consolidated Mining Company.—The face of the Ladiz drift, in the St. Johns ground, is running south from the Sutro tunnel, and is reported to be cutting into very favorable material.

Savage Mining Company.—The very pronounced manner in which the newly elected board of directors, with the exception of one of their number, adopted a contract for milling the company's ore, which practically placed the stockholders at the mercy of the thrice infamous mill-ring, has provoked a very loud remonstrance from several quarters. The Sacramento press published a letter, forwarded to the board of directors, in which each member individually, was appealed to, and received a mild "roasting."

The overtures made by the Savage directors to the Chollar, Potosi and Norcross companies to join in purchasing a mill, have not been favorably received. The Hale & Norcross company—that is "Jim the Reformer"—by the hand of its president, sent a letter to the Savage company—also controlled by him—wherein it was stated that the Norcross company is not able financially to advance funds for any purpose save the exploration of its property. The Chollar and Potosi are also expected to refuse to join in. Meantime, N. H. Fox has forwarded the following bid to the Savage company, for crushing that corporation's ore:

"I will enter into a written contract with the Savage Mining Company for one year to mill its ore upon the following terms and conditions:

"1. The ores to be delivered to the mill at the company's expense—this expense not to exceed what is now being paid by the Consolidated California & Virginia Mining Co.

"2. The price for milling the ores to be paid at the rate of \$3.50 per ton.

"3. The return in bullion to be not less than 65% of the railroad car sample assay on all ores not less than \$20 per ton by railroad car sample assay."

This would seem to be a very good contract if the Savage directors are earnest in their desire for reform. But it is safe to say it will not be accepted. The mill-ring having the assayer under control, can afford to bid as low as J. W. Fox, and make a return from \$50 rock, on a \$20 basis, and so rob the

stockholders as easily as ever. A meeting of the directors will be held in the near future to consider the bids, when a lively time is expected.

NEW JERSEY.

Hunterdon County.

The company of which T. A. Edison is president has leased 100 acres of land in Upper Milford, N. J., and intends to erect at that place a plant for the magnetic separation of iron ores.

NEW MEXICO.

Graut County.

The situation at Hanover remains unchanged, says a dispatch. Not a pound of ore is being shipped on account of the trouble between the railroads, and there seems to be no immediate prospect of a settlement of the rate question. Nearly all the mines there are closed down, and will probably remain idle for weeks. Up to the time the Atchison, Topeka & Santa Fe Railroad refused to furnish cars to the Silver City and Northern the production of the camp was restricted only by the ability of the railroad to handle the ore, and the demand for it at the smelters. Within the past 10 days some of the heaviest rains have fallen which have been seen in that part of New Mexico for years. There will be no further difficulty about getting water enough to keep the mills running, and it is expected that several mills which have been idle for months will be started within a week. There is water enough in the mountains for the use of placer miners, and a number have already commenced work.

Sierra County.

The new smelter at Hillsborough is treating about 30 tons of ore a day, and is turning out fine copper matte, which will be shipped to the Argo works at Denver to be refined. This is the first attempt which has been made at Hillsborough to smelt ore.

PENNSYLVANIA.

Coal.

A mass meeting held in Phillipsburg, on the 8th inst., by representatives of over 3,000 miners in the Clearfield District, declared that the men would strike on September 1st unless an advance was made in the price of low grade coal mining and a change made in the checkweighman system. A resolution was also adopted calling on the men in the Punxsutawney District, which adjoins the Clearfield District, to stand firm for demands of the same character which they have presented to the operators.

Philadelphia & Reading Coal & Iron Company.—It is reported from Altoona that this company, through the Lehigh Valley Coal Company, has for some time been quietly buying all the good coal tracts in the Snow Shoe district. The work has been thoroughly done, and now all the tracts except the possessions of a few small operators, have been secured. The output will be handled over the Beech Creek Railroad.

SOUTH DAKOTA.

Lawrence County.

According to the Deadwood "Daily Pioneer," the Harmony, Double Standard and Plutus mines have been bonded to Samuel Allerton, of Chicago, for \$175,000. The mines extend from Fantail to Nevada Gulch, and on all of them bodies of ore have been discovered.

Deadwood and Delaware Smelter.—Four cars of lead ores for fluxing arrived at the smelter from Idaho on Aug. 6. This is the first shipment of this kind of ore that has been received at the smelter for nearly a month, and the works have been seriously affected, says the Black Hills "Times." The cause of the non-arrival of this class of ore is owing to the strike at the Idaho mines.

McGee and Daegling Amalgamating Works.—The company which has been making test runs on Bald Mountain ores for some time will shortly have the works ready for continuous operation.

Two Bears.—Reports from this mine state that the water has been lowered 30 ft. below the first station, a depth of 136 ft. As soon as the mine is pumped out, extraction of ore will commence, and a contract for sinking 100 ft. beyond the bottom of the present shaft will be let, making a depth of 336 ft. When the shaft is down 450 ft. a large Cornish pump will be put in.

UTAH.

Box Elder County.

Willard.—It is reported that a 4-ft. vein of copper ore has been discovered in one of the Willard iron mines.

Juab County.

Champion Mining Co.—The Salt Lake Tribune reports that S. B. Moore has brought suit against this company and the Bullion-Beck for a one-tenth interest.

Dragon.—About 100 tons are being shipped from this iron mine per day.

Nephi.—It is reported that a bed of coal has been discovered about 12 miles from this town.

Northern Light Mining Company.—The Golden Key and Silver Star are being developed. About 125 tons of ore, which averages about 24 per cent.

lead, 9 oz., silver, \$4 gold and 64 lbs. bismuth to the ton, are on the dump, and a shipment will be made in a short time.

Tetro Tunnel.—This tunnel in the Godiva is being driven as fast as possible. Promising vein matter is reported to have been found.

Salt Lake Co.

Flagstaff, Limited.—The company is working 22 men. Lately it sent in a shipment of 200 tons of second-class ore. This runs about 80 oz. to the ton. This mine has put in two Burrell compressors, and is running one hoister from the fifth, sixth and seventh levels. Day and night shifts are worked, the day shift hauling the waste and the night shift ore. Professor Vincent, the superintendent, left last week for England on a summons from the directors, and a material increase in the force is expected on his return.

South Galena Mining Company.—A large force of carpenters are at work upon the new mill. The company has leased the Niagara mill, which is capable of treating from 125 to 150 tons of ore per day.

Summit County.

Crescent Mining Company.—The Richardson concentrator is doing good work on the ore from the upper workings, but the power is too small. The plant consists of a 6-H.P. engine, 2 fine double jigs, a pair of cornish rolls and a rock breaker.

Creole.—There are 35 tons first-class and 85 tons second class on the dump. A drift is being run from the 100 ft. level to tap the main vein, which it is thought will be reached within another 40 ft.

Daly West.—The shaft is to be sunk to the 1,200 ft. level. It is now down between 800 and 900 ft., and no drifting will be done until the last level is reached. This work was begun 10 months ago, and has been prosecuted by hand drills. A lay-off of one month was made, thus showing that the shaft has gone down nearly 100 ft. per month.

Silver King Mining Company.—The company is putting in new hoisting works for which the foundations are already laid.

Woodside Mining Company.—This mine was closed down on August 1st, and all hands discharged except the watchman. The Park City "Record" says: "What appeared to be a large body of ore was encountered in this property some time ago, but it proved to be so mixed with quartz and other vein matter that it could not be made to pay. Much expensive development work has been done, but it has so far been impossible to locate a second ore chute."

WASHINGTON.

Okanogan County.

Rainbow Mining Co.—This company has 10 claims in the Loomiston district on all of which some development has been done. The main tunnel on the Rainbow ledge is in 150 ft. and shows a 2 ft. vein of high grade ore. A 60-ft. vein connects with the tunnel. A winze is now being sunk on the vein, it is down 35 ft., and the vein has opened out to 5 ft. 700 tons of ore are on the dump, which it is claimed will average \$25 per ton in gold. The Coyote has a 70-ft. shaft which shows a well defined vein. The company has a 10-stamp mill in operation, and it is proposed to put in a concentrator.

Pierce County.

Wilkeson Coke Works.—The company will start operations in September, according to the Helena "Journal." It is said that this coke can be furnished for \$12 per ton, less than half the price of Eastern coke. It is also reported that the Union Iron Works of San Francisco and the Oregon Steel Works have made arrangements to use this coke.

WISCONSIN.

Iron.

Ashland Ore Shipments.—The Ashland "News" says there is now no doubt but that the heavy ore shipments from that port during the season of 1890 will be equalled, if not surpassed, by the total of this year. The shipments up to the week ending August 8th 1890, amounted to 1,174,376 tons; up to date the shipments for the season had reached 1,132,914 tons, or only 41,462 tons less than the season of 1890 up to the corresponding time. The shipments for the past few weeks have been extremely large, and about 20,000 tons in excess of the weekly shipments about this time in 1890, so that the difference between the two seasons will be wiped out in a couple of weeks. The shipments from the Central dock so far this season have amounted to 581,176 tons, which is 46,000 tons in excess of the 1890 shipments up to the same time. The Lake Shore lacks 87,000 tons of equalling its own record up to the same time in 1890.

Iron—Gogebic Range.

Milwaukee.—All the mines under the control of the Wisconsin Central Railroad Company on this range, except the Ashland, have been closed, and about 2,000 men thrown out of employment. The cause of the shut-down is indirectly attributed to the Homestead strike. No ore from any mine under the control of the Wisconsin Central Company will be shipped, except from the Ashland mine, until the Homestead matter is settled.

WYOMING.

Natrona County.

Johnston Syndicate Improvement Company.—According to the Casper "Derrick" this company has expended \$50,000, preparatory to cleaning and separating the soda from the great Sweetwater natural soda lakes. The company is now ready to start the fires for preparing the soda.

FOREIGN MINING NEWS.

AUSTRALIA.

Discovery of Wolfram at Broken Hill.—A circular has been sent round Broken Hill, N. S. W., stating that efforts are being made to float a small company under the title of the Barrier Wolfram Proprietary Company, Limited, having for its object the acquisition of mineral claims numbered 70, 77, 73, 82, 83, 91 and 150, Parish of Waukeroo, County of Yancowinna, containing in all 257½ acres, and working them for the production of wolfram (tungstate of iron), tin and other minerals. The principal object of the company will be to open up the lodes, and simultaneously enter into negotiations with business firms, either in England or on the Continent, for the purpose of forming the property into a larger company, with ample working capital to insure the erection of machinery and the development of the existing deposits of tin and wolfram ores. The claims are located about 25 miles from Broken Hill, on the Tarrawingee line.

New South Wales.

In the midst of all the terrible misery arising from the depression of the coal-mining industry in New South Wales, a serious labor complication is threatened at the Wallsend Colliery, near Newcastle. A dispute between the company and the miners as to the price to be paid for certain work in the mine was recently adjudicated upon by a referee, with a result favorable to the miners, inasmuch as payment by the company of 3d. per ton extra for the particular work as it involved the in question. The company, acting within their undoubted right, now decline to work the portions of the mine affected by the award of the referee, and the miners are raising trouble in consequence. Matters have not assumed the shape yet of any definite demand upon the company, and we fail to see what can very well be urged to induce a change of attitude. The position of the company is unassailable, and in the present condition of the coal trade the miners could have expected nothing else, if gifted with the most ordinary foresight.

CANADA.

Nova Scotia.

It is reported that the coal mining companies of the Joggins district will consolidate their interests, a bill passed by the Legislature early this year, making such a consolidation possible. New York parties are, it is said, ready to take the entire issue of bonds. According to a later dispatch (Aug. 9), it was decided at a special meeting of the Joggins Coal Mining Association to sell the property for \$160,000, to New York capitalists.

According to the Halifax "Critic" the outlook for mining is better. Iron and coal mining are on the increase, but copper, lead and manganese mining is nearly stationary. There is an increased output of gypsum from the quarries at Mabon. Owing to the advanced duty on lime under the McKinley bill, no shipments of lime are being made to the United States this year.

Palgrave Gold Mining Company.—The case of this company vs. McMillan et al. was appealed to England by the company, who had obtained an award settling the amount of damages to be paid for certain surface rights in connection with the company's mining property at Hurricane Island, Isaac's Harbor. The surface containing this mine was claimed by one John McMillan et al., who also claimed the company's mine. The arbitration proceedings which settled the parties' respective rights were removed to the Halifax court; the majority of the judges set aside the award with costs against the company. This decision was reversed by the Privy Council, judgment with costs being given the company. This decision is very important to the mining interests of Nova Scotia, as it has finally settled several doubtful points with respect to the proper mode of assessing damages and how the property is to be set off and described, etc.

GREAT BRITAIN.

A new coal field with an ascertained area of 1,000 acres has been discovered at Ashton-under-Lyne, Lancashire. Coal was already plentiful in that vicinity.

MEXICO.

Sinaloa.

Anglo-Mexican Mining Company.—Advices from Durango announce the robbery near Culiacan of a train of sulphides from the lixiviation works valued at \$50,000. The train was strongly guarded, but the bandits succeeded in capturing it. The Government has ordered troops in pursuit.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, August 12th.
Heavy Chemicals.—The position of the various heavy chemicals has not changed since our last report. So far as sales for immediate delivery are concerned, not much business has been done during the week. For future delivery, however, a fair amount of trading is reported. In certain articles, as carbonated soda ash, there has been more firmness, the impression prevailing among consumers that an advance is probable, owing to the decrease in the exports during the past few months. Caustic soda has been quiet on the spot, but several sales are reported for future delivery. The same may be said of alkali and bleaching powder. Our quotations this week are as follows: Caustic soda, 60%, 3'17½@3'20c.; 70%, 2'95@3'12½c.; 74%, 2'97½@3'12½c.; 76%, 3'12½@3'25c.; 77%, 3'12½@3'25c. Carbonated soda ash, 48%, 1'60@1'62½c.; 58%, 1'52½@1'55c. Alkali, 48%, 1'50@1'55c.; 58%, 1'47½@1'52½c. Sal soda, English, 1'07½@1'15c. American, 1'05@1'10c. Bleaching powder, 2'15@2'20c. on the spot, according to quantity.

Acids.—A normally good business has been done in the various acids during the week, both for prompt and early fall delivery. There is no change to report as to prices, and we accordingly quote: Acid per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, \$1.60@2, according to quality; muriatic, 18°, 80c.@\$1; 20°, 90c.@\$1.10; 22°, \$1@1.25; nitric, 40°, \$4; 42°, \$4.50@4.75; sulphuric, 85c.@\$1.10; mixed acids, according to mixture; oxalic, \$7.25@7.75. Blue vitriol is quoted all the way from \$3.25@3.50; alum, lump or ground, \$1.55@1.80. Glycerine for nitro-glycerine, 11½@12½c., according to quality and quantity.

Brimstone.—The market for brimstone is slightly firmer than last week, although nothing of especial importance has occurred since our last report. Quotations are as follows: To arrive, near due, \$24.50 for best unmixed seconds, and \$23.50 for best unmixed thirds. To arrive, August-September shipments, \$24.25 for best unmixed seconds, and \$23.25 for best unmixed thirds. There are no available goods on the spot and dealers, therefore, cannot quote them.

Fertilizers.—A better demand has been experienced for fertilizing materials during the week, and prices in certain instances have advanced somewhat. The fall season has not set in yet, and altogether the market is rather quiet. Our quotations this week are as follows: Sulphate of ammonia, \$2.85 for bone goods and \$2.90@2.95 for gas liquor. Dried blood, \$2@2.05 per unit for high grade and \$1.90@1.95 for low grade; acidulated fish scrap, \$13.50 f.o.b. factory; dried scrap, \$23@23.50. Azotine, \$1.95. Tankage, \$18@22, according to grade. Bone meal, \$22.50@23.50.

Double Manure Salts.—Quotations are as follows for lots of from 10 to 50 tons ex-vessel New York: 48-53%, \$1.13¼@1.23¼; 99-95%, \$2.13@2.23½.

Kainit.—The market for kainit is very quiet. Prices remain \$8.75 for invoice weight and \$9 for actual weight, New York and Philadelphia.

Muriate of Potash.—The market for muriate is very quiet. Arrivals during the week amount to 170 tons. Sales of 100 tons are reported. The prices fixed by the Sales Syndicate prevail as follows: Fifty-ton lots or over, New York and Boston, \$1.81½; Philadelphia and Baltimore, \$1.84; Southern ports, \$1.86½.

Nitrate of Soda.—The market for nitrate is stronger. Quotations are as follows: Spot, \$1.80 to \$1.85.

Messrs. Mortimer & Wisner, the well known nitrate brokers of this city, send us the following interesting statistics:

	1892.	1891.	1890.	1889.
	Bags.	Bags.	Bags.	Bags.
Imported into Atlantic ports from West Coast S. A. from Jan. 1, 1892, to date...	446,447	351,517	449,742	309,593
Imported into Atlantic ports from Europe.....		18,802		
Stock in store and afloat Aug. 1, 1892, in New York.....	446,447	370,319	449,742	309,593
in Boston.....	46,977	66,729	46,627	62,617
in Philadelphia.....	1,000	1,600		1,200
in Baltimore.....	8,300	6,500	1,000	5,500
To arrive, actually sailed.....	164,000	204,000		
Visible supply to Oct. 1, 1892.....	220,277	278,829		
Additional charters.....	70,000	200,000	483,000	269,900
Total supply, when shipped.....	290,277	478,829	530,627	339,217
Stock on hand, Jan. 1, 1892.....	53,585	36,454	22,009	87,043
Deliveries past month.....	68,908	36,383	71,796	58,683
Deliveries since Jan. 1 to date.....	448,755	831,944	423,524	327,319
Total yearly deliveries.....		634,207	673,679	546,589
Prices current Aug. 1, 1892.....	1¼c.	1'80@1'85c.	1'65c.	1'85c.

Phosphates.—Mr. Paul C. Trenholme, of Charleston, S. C., sends us the following interesting statistics showing shipments of phosphate rock from Charleston during July, 1890, 1891, and 1892: Domestic—1890, Crude, 21,599; 1891, crude, 19,988, ground, 700; 1892, crude, 14,035, ground, 1,500. Foreign—1890, crude, 5,284; 1892, crude, 2,250.

Liverpool. August 3.

(Special Correspondence of Joseph P. Brunner & Co.)
 We have no improvement to note in the demand for heavy chemicals, as there still is very little business passing. Soda Ash.—Some sales are reported for 1893 on private terms, but for prompt delivery to the end of this year the article is very scarce, and in consequence quotations are quite nominal, as follows, viz: Caustic ash, 48%, £5 6s. 3d. per ton; 57-58%, £6 7s. 6d. per ton. Carh. ash, 48%, £5 9s. 9d. per ton; 58%, £6 12s. 9d. per ton. Ammonia ash, 58%, £6 7s. 6d. per ton, all net cash.

Soda crystals are in fair request at £3 7s. 6d. @ £3 10s. per ton, less 5%. Caustic soda is only in retail demand, but quotations are without change, viz.: 60%, £9 2s. 6d. per ton; 70%, £10 5s. per ton; 74%, £11 5s. per ton; 76%, £12 5s. @ £12 10s. per ton, all net cash. The quotations apply to all quarters except United States and Canada. For parcels under 10 tons 5s. per ton extra is charged.

Bleaching powder is steady at £7 15d to £8 per ton net cash for hardwood packages for all quarters except United States and Canada. Chlorate of potash is inactive at 6½d. to 6¼d. per pound less 5% for prompt delivery, and for September and December resale parcels could probably be had for 6¼d. while for same delivery the Alkali Company quote 6½d. Bicarb. soda is in good demand at £6 15d. per ton, less 2½% for one cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia is rather lower if anything and on the spot we quote about £10 2s. 6d. per ton for good gray 24% and £10 6s. 3d. per ton for 25%, both in double bags, less 2¼% f. o. b. here.

MINING STOCKS.

NEW YORK, Friday Evening, August 12, 1892.

(For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo., Baltimore, Pittsburgh, Deadwood, Dak., St. Louis, Helena, Mont., London and Paris, see pages 166 and 168.)

The mining market during the past week has exhibited the same apathy which has characterized it for many months past. There is but little demand for mining stocks in these days. Now and then there is some inquiry for a particular stock, but it is of a spasmodic character, lasting only for a few days and then vanishing as suddenly and unexpectedly as it came. During the past week one or two of the gold mining stocks have been in request, but not much actual business has resulted. The disinclination to sell at present prices is almost as great as the reluctance to buy.

Of the Comstocks, Consolidated California and Virginia was very active. During the week 1,100 shares were sold at \$3.40@3.50; a portion of this was sold at the New York Stock Exchange. Of Crown Point 200 shares were sold at 65c., and of Hale & Norcross 150 shares at \$1. Ophir shows a solitary transaction of 190 shares at \$1.60, and Savage one of 200 shares at \$1.05. Of Sierra Nevada 250 shares were sold at \$1.40. Yellow Jacket shows sales of 400 shares at \$1.55@1.60. Other sales were as follows: Best & Belcher, 125 shares at \$1.50; Comstock Tunnel stock, 1,900 shares at 12c.; Mexican, 200 shares at \$1.45@1.50; Union Consolidated, 350 shares at 90@91.5. The financial statements of the various companies will be found elsewhere in this issue.

The Tuscaroras were rather more active this week. We note sales of 300 shares of Belle Isle at 17c.; 200 shares of North Belle Isle at 15c.; 400 shares of Consolidated Imperial at 13c., and 400 shares of North Commonwealth at 30c.

There was a sale of 100 shares of Eureka Consolidated at \$1.65

Among the California stocks, Bodie Consolidated shows sales of 500 shares at 35c. An equal number of shares of Bulwer was sold at 35c. Plymouth Consolidated shows sales of ten shares at 75c. Since we published the news of the cessation of operations at the Plymouth mine speculation has been rife as to what would be the final outcome, in so far as the holders of shares were concerned. Mr. Warner Van Norden, President of the Plymouth Consolidated Gold Mining Company, stated to-day to a representative of the ENGINEERING AND MINING JOURNAL that a thoroughly competent man had been sent to California to report upon the property. This report will be submitted to the Board of Directors, who will then decide upon the best course to pursue. It is hoped that the board will be able to hold a meeting next week. A full account of the meeting will be published in this paper later.

Standard Consolidated appeared in considerable demand, 1,200 shares being sold at \$1.45@1.60. Belmont was quiet this week, only 200 shares were sold at 36 to 38c. The superintendent of this mine sends the following telegram dated Sutter Creek, August 10th: "Drifting has commenced on the 200 ft. level. The mine looks very promising."

Of Brunswick Consolidated 2,300 shares were sold at 15@17c. The superintendent of this mine, writing under date of the 3d inst., says: "Since my last the mine has been improving, especially since the upraise has opened up the ore body. The ledge

varies in width, but shows good milling ore. The mill started up to-day. I have ore in sight for a month and it looks as if it will continue. Both bins are full of ore. The raises were extended 10 ft. in the east drift and 4 ft. in the west drift; total, 61 ft." The following telegram, dated Grass Valley, August 8th, also was received: "The mine looks well and has greatly improved. The plates are looking well."

Of Horn Silver only 200 shares were sold this week at \$3.60. The financial statement of the Horn Silver Mining Company for the quarter ending June 30th has been issued. It shows the receipts to have been as follows: Sales of ore during April, May and June (including royalty on Cave ore), \$94,901.98; interest account, \$1,043.33; smelter at Francklyn (house rents), \$75. Disbursements: Mining, \$40,901.71; general expenses (salaries Frisco and Salt Lake City), \$2,914.99; legal expenses (contracted under former management), \$1,474.43. New York office, \$3,583.35; dividend (No. 26), \$50,000; balance cash on hand, \$274,657.76.

Of the Colorado stocks we note sales of 400 shares of Freeland at 4c.; 1,100 shares of Leadville Consolidated at 14@15c.; 500 shares of Little Chief at 24@25c.; 1,000 shares of Robinson Consolidated at 37@40c.

Of the Black Hills stock Caledonia shows a sale of 100 shares at 86c.; at the close 90c. was bid, with no stock offering at that price. Of Deadwood Terra there were sales of 500 shares at \$2.10@2.15, and of Father de Smet, 500 shares at 25 to 26c. Sullivan Consolidated continues to be quoted at \$1@1.05. We would call the attention of the officers of the Consolidated Stock and Petroleum Exchange to our remarks in preceding issues of the ENGINEERING AND MINING JOURNAL in which we gave information that should prove a warning to the promoters of this company.

There was a solitary sale of 100 shares of Alice at \$1.65.

El Cristo shows sales of 400 shares at 25@30c. Elsewhere in this issue will be found interesting news about this property.

Of Phoenix of Arizona 500 shares were sold at 52c. Of Kingston & Pembroke 1,600 shares changed hands at 20@25c.

Boston. August 11.

(From our Special Correspondent.)

The market the past week has been extremely dull and without special feature. The past two days the transactions have been very light, the only stock showing any life being Tamarack, Jr., which on rather more favorable advices from the mine was in demand at an advance from \$19½ to \$22¼. Boston & Montana was slightly firmer in price, selling at \$37¼, a gain of \$½ per share. Butte & Boston was only dealt in to the extent of 150 shares at \$9¼@9½, being a slight gain over last week.

Calumet & Hecla sold ex-dividend \$5 per share at \$280, which is a net loss of \$5 for the week.

Tamarack has ruled steady at \$157@158, most of the sales being at the latter price.

Centennial gained a fraction, selling up to \$7¼.

Kearsarge sold at \$11¼, the first sale for two weeks.

Osceola very firm at \$32¼. The directors have declared a dividend of \$1 per share, payable Sept. 1, which will be welcome news to the stockholders.

Alouez sold at \$1, same as last week, and Santa Fe at 11@12¼c.

The rest of the list was entirely neglected. Silver Stocks.—A lot of 1,000 shares of Coeur D'Alene sold at 70c., the first sale for over three months.

PIPE LINE CERTIFICATES.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.					
	Opening.	Highest.	Lowest.	Closing.	Sales.
Aug. 6.....	54	54	53	53	13,000
8.....	52½	53½	52½	53½	22,000
9.....	53½	56½	55½	55½	37,000
10.....	53½	59¼	53	53	19,000
11.....	56½	57¼	56	56½	65,000
12.....	56½	57	56½	56½	25,000
Total sales.....					181,000

ASSESSMENTS.

COMPANY.	No.	When levied.	D't'nt' in office.	Day of sale.	Amt per share.
Alta, Nev.....	42	June 18	July 26	Aug. 16	.15
Bodie Con., Cal.....	14	June 20	July 22	Aug. 22	.25
Comm'nwealth, Nev	8	June 16	July 21	Aug. 18	.10
Cons. N. York, Nev.	8	June 28	Aug. 2	Aug. 23	.10
Exchequer, Nev.....	33	July 27	Aug. 31	Sept. 20	.10
Florida Hill Gravel,					
Idaho.....	4	July 27	Sept. 2	Sept. 28	.30
Gold Mountain, Cal	3	July 16	Aug. 20	Sept. 8	2.00
Golden Pledge Grav-					
el, Cal.....	17	July 6	Aug. 24	Sept. 20	8.00
Gray Eagle, Cal.....	20	July 6	Aug. 9	Aug. 30	.06
Himalaya, Utah.....	69	June 13	July 13	Aug. 13	.00½
Kentuck Con., Nev.	4	July 15	Aug. 18	Sept. 8	.10
Mountain Tunnel					
Gravel, Cal.....	5	July 23	Sept. 5	Sept. 26	.07
Peerless, Ariz.....	18	July 6	Aug. 11	Sept. 7	.05
Peer, Ariz.....	13	July 19	Aug. 25	Sept. 22	.10
Rainbow, S. Dak....	6	July 19	Aug. 20	Sept. 9	.00½
Scorpion, Nev.....	4	July 11	Aug. 19	Sept. 12	.05
Silver King, Ariz....	8	July 19	Aug. 27	Sept. 27	.25
Union Con., Nev....	46	July 18	Aug. 24	Sept. 13	.25
Western Star, Cal.,	1	July 25	Aug. 30	Sept. 21	.02

DIVIDENDS.

American Coal Company, semi-annual dividend of three per cent. upon the capital stock of the company, payable on September 10th at the office of the company, No. 1 Broadway, New York City. Transfer books close August 31st and reopen September 12th.

Aspen Mining and Smelting Company, dividend of 10 cents per share, \$20,000, payable August 16th at the office of the company, No. 54 Wall street, New York City. Transfer books close August 10th and reopen August 17th.

Deadwood Terra Mining Company, dividend No. 44, of 5 cents per share, \$10,000, payable August 20th at the office of the transfer agents, Messrs. Lounsbury & Co., Mills Building, New York City.

COAL TRADE REVIEW.

New York, Friday Evening, August, 12th.

Statement of shipments of anthracite coal (approximated) for week ending August 6th, 1892, compared with the corresponding period last year.

Regions.	Aug. 6, 1892.	Aug. 8, 1891.	Difference.
	Tons.	Tons.	
Wyoming Region....	415,444	392,630	Inc. 22,814
Lehigh Region.....	111,267	116,137	Dec. 4,870
Schuykill Region....	214,266	220,887	Dec. 6,621
Total.....	740,977	729,654	Inc. 11,323
Total for year to date	23,739,859	22,565,654	Inc. 1,174,205

PRODUCTION OF BITUMINOUS COAL for week ending August 6th, and year from January 1st.

EASTERN AND NORTHERN SHIPMENTS.

	1892.		1891.
	Week.	Year.	Year.
Phila. & Erie R. R.....	1,013	52,308	111,195
Cumberland, Md.....	70,537	2,168,175	.....
Barclay, Pa.....	2,130	116,047	107,845
Broad Top, Pa.....	9,327	340,888	288,834
Clearfield, Pa.....	62,327	2,352,382	3,585,918
Allegheny, Pa.....	25,114	150,726	944,092
Beach Creek, Pa.....	41,196	1,483,231	1,353,079
Pocahontas Flat Top.....	54,822	1,399,811	1,427,073
Kanawha, W. Va.....	46,000	1,374,085	1,343,049
Total.....	312,469	8,335,648	9,363,695

WESTERN SHIPMENTS.

	1892.		1891.
	Week.	Year.	Year.
Pittsburg, Pa.....	20,324	765,975	791,858
Westmoreland, Pa.....	30,788	986,969	1,439,909
Monongahela, Pa.....	7,927	362,292	467,144
Total.....	29,039	215,236	2,698,911
Grand total.....	341,508	8,250,884	11,062,606

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending August 6th, 1892, and year from January 1st, in tons of 2,000 lbs.: Week, 83,320 tons; year, 3,255,540 tons; to corresponding date in 1891, 2,262,921 tons.

Anthracite.

The state of the anthracite trade is very much the same as it was last week. The supply of coal is in excess of the demand and all the stocking plants are full. There is also a great deal of coal on the rails in cars. For the time of year the demand is fair and the amount passing into the hands of consumers is about the same as last year. No doubt the amount would be greater if it was not that consumers stocked very fully in view of the expected advance on the 1st August. As far as new business is concerned the trade is very dull.

A report was published in one of the daily papers on Wednesday that the Pennsylvania Railroad and Coal and Iron companies had joined the Reading anthracite combination. Everybody connected with the Pennsylvania interests, either indignantly or amusedly, denied the report. There is no doubt that so great a company as the Pennsylvania would not submit to a diminution of its influence in this way; but at the same time we believe that they have agreed among themselves, and, perhaps, with the Reading, not to cut rates against the combination but to take every advantage of the improved prices brought about by the deal.

In Philadelphia reports have been current that the Pennsylvania has been cutting rates to obtain anthracite orders. The agents in this city deny this report, but state that in some of the inferior qualities the selling price is low and that the rates for some old customers have not been advanced.

The output is not being restricted by some mine owners to the extent that was agreed upon at the beginning of the month. The Reading company at most of its collieries worked only three days instead of four as usual.

The stagnation in the anthracite coal trade is reflected in the coal shipments over the Reading system last week. The total shipments aggregated 430,230 tons, compared with 477,701 tons in the corresponding week of 1891, a decrease of 47,470 tons. The shipments over the system since January 1st are still three-quarters of a million tons ahead of the shipments in the same period in 1891. Since January the company has moved 17,433,400 tons, against 16,674,967 tons in the same time last year. The figures embrace both anthracite and bituminous coal.

The sales agents will meet again on the 15th inst. to consider the question of prices again, but it is generally said that the meeting will adjourn for a fortnight without any business being transacted. The probabilities still point to a rise of 25 cents at the end of this month, but this will depend on how the present stocks get cleared off and also on the expected autumn increase in the demand.

No further proceedings have occurred in the official inquiries as to the legality of the Reading combine. The decision in the Trenton court is not expected for some time.

Bituminous.

The bituminous coal trade continues to be regular and quiet. Contractors are taking moderate amounts of coal, but the amount of new business is small. The facilities of shipment on the railroads are very bad, in fact, as bad as they have ever been. On the Pennsylvania Railroad there is great delay in transit of cars. The Baltimore & Ohio are worse offenders than ever in the matter of allowing favorite customers to use their cars for stocking purposes, and they do not attempt to deny it. The trouble on the Chesapeake & Ohio is not so great, and there is a fair supply of cars on that road. There is a great supply of coal vessels, especially at Philadelphia, and freight rates are weak. Rates from Philadelphia to Sound ports are 65-70 cents; to Boston, Salem and Bath, 70 cents, and to Portsmouth, 75 cents. From other ports the rates are 5 cents higher all round. In making charges quick loading at shipping ports is an important item. The hot weather does not appear to have interfered with the unloading and loading of coal, as it did a few weeks ago.

Boston.

August 11.

(From our Special Correspondent.)

Anthracite coal remains very quiet. Dealers are doing very little, and, consequently, are not in need of new supplies. In anticipation, however, of an advance in September dealers are inquiring in regard to coal and probably will buy just as much and as soon as they can. Dealers here not only feel as though there was going to be an advance but a good heavy one, as there was no advance made in August. So far as I can learn there is no cutting in prices here. To the contrary, they are quite firm.

We quote, f. o. b., prices at New York, stove, \$4.50; egg, \$4.20; free broken, \$3.90; chestnut, \$4.40; Lykens Valley (at Philadelphia), broken, \$4.75; egg, \$5.25; stove, \$5.75; chestnut, \$4.75.

In soft coal there is about as little doing as in hard. Dealers are not taking any new orders to speak of. About all the business they are doing is on old contracts. On these they are kept quite busy. Prices on soft coal are rather easy, averaging five cents per ton lower than a week ago. We quote: Clearfield, \$3.10@3.15; George's Creek, \$3.40@3.45 on cars here.

The extreme dullness in trade has had a depressing influence on freight rates. In fact many of the rates to various points are lower.

We quote: From New York to Boston, 50@-c.; from Philadelphia to Boston, 60@65c.; from Philadelphia to Portland, 65@70c.; to Bath, 75@80c.; to Providence, 65c.; from Baltimore to Boston, 70@-c.; Newport News to Boston, 70@75c.; Sound Ports, 65@70c.

In a retail way there is the usual August dullness. The result of the present quietness is to keep stocks intact, consequently dealers have but little opportunity to buy. The largest retail dealers in this city told the correspondent of the JOURNAL that if the coal combination makes an advance in hard coal this September the retail dealers will also put up prices accordingly. They cannot to-day replace coal for the price they are selling it at. For two months consumers here have been receiving the benefits of wise purchases in June by the retail dealers before the last advance in prices took place. It seems to-day as though the consumer that purchased his fall supplies this month will make quite a saving, as after September 1st he is pretty sure to pay more than he would now.

Retail prices are firm but unchanged. We quote stove, \$6.00; nut, \$6.00; egg, \$5.75; furnace, \$5.50; Franklin, \$7.25; Lehigh egg, \$6.00; Lehigh furnace, \$6.00. Wharf prices 50 cents less than the foregoing.

Buffalo.

August 10.

(From our Special Correspondent.)

Considering the proposition recently broached in Buffalo for the city to buy large quantities of coal at present prices to sell at cost to the citizens in advent of a raise in prices, it was the consensus of opinion among coal men that this would not be feasible. The city could buy the coal, it is true, but would have no place to stow it, and a large capital would be locked up. This opinion applied also to individuals seeking to gain a profit underselling the combine.

The shipments of coal by lake westward from August 1st to 9th, both days inclusive, were 100,354 net tons, distributed about as follows: 40,730 to Chicago, 24,325 to Milwaukee, 6,000 to Duluth, 8,950 to Superior, 1,150 to Bay City, 750 to Racine, 500 to St. Ignace, 4,760 to Toledo, 1,100 to Hancock, 1,404 to Ft. William, 600 to Parry Sound, 250 to Detroit, 1,075 to Houghton, 2,800 to Gladstone, 2,440 to Menominee, 500 to Kenosha, 720 to Lake Linden, 200 to Port Stanley, 1,675 to Green Bay and 925 to Saginaw. The rates of freight were 60c. to Chicago, Milwaukee, Menominee, Green Bay and St. Ignace; 90c. to Al-

gonac Mills; 50c. to Lake Linden, Houghton and Hancock; 40c. to Saginaw and Parry Sound; 25c. to Toledo and Detroit; 35c. to Duluth, Lake Superior and Bay City; 70c. to Kenosha and Racine, and 55c. to Gladstone, closing firm. Coal scarce on the docks.

The Erie coal statement for first week in August shows the receipts of coal at this port were 615 net tons and the shipments 1,896 net tons.

The coal for the public schools of the city will be supplied by Messrs. Joseph E. Gavin & Co., at the following figures: egg, 4.69; stone, 4.68; nut, 4.73; for 2,000 lbs. delivered screened.

Chicago.

August 11.

(From our Special Correspondent.)

The trade generally, as well as consumers, don't or won't realize that the consolidated companies are masters of the situation and able to put prices just where they please. That they will do this does not admit of a doubt and consumers will have to pay. Receipts of anthracite via the lake and all rail up to end of July amount to 800,000 tons, and if we are to have the same tonnage as last year there remains a million tons yet to come forward. This it should be remembered does not include the natural growth of consumption, which may be safely computed to absorb an additional 100,000 to 150,000 tons.

The non-advance in anthracite has not in any sense of the word stimulated city trade either wholesale or retail. A member of one large concern sententiously remarked that "it was like Sunday all the time." There is no doubt but that business is quiet, but scarcely as bad as that remark would infer. Inquiry from the country is improving, but as yet it cannot by any stretch of the imagination be called active. Traveling salesmen find it difficult to sell coal in the West and Northwest, and much of this business will be very largely dependent on crop prospects. City retail trade is dull, accounted for in a great measure by so many absentees on vacations, but whatever the cause, it is very quiet.

Bituminous coal on the whole shows very little if any improvement over that of last week, though there is certainly a better inquiry from the country. New business in the line of the lake trade is light, and will probably continue so for a few weeks. The coal operators of the Wilmington, Streator and La Salle districts have advanced prices 10¢, but this, to a large extent, is nominal. Hocking is cut about 15¢ from circular and other coals similarly. Railroads are becoming anxious about what they call the unnecessary delay in returning empty cars, and are issuing circulars to shippers requesting their aid in urging upon their customers the necessity for the prompt unloading of coal cars.

Coke is in quiet demand from foundries and other large consumers of that grade. Increasing inquiry is noted for domestic sizes of Connellsville crushed. Quotations are: \$4.65 furnace; \$5.05 foundry crushed; \$5.40 Connellsville; West Virginia, \$3.90 furnace, \$4.10 foundry; New River foundry, \$4.75; Walston, \$4.65 furnace, \$5 foundry.

Circular prices are at the following rates: Lehigh lump, \$6.50; large egg, \$5.60; small egg, range and chestnut, \$5.85. Retail prices per ton are: Large egg, \$7; small egg, range and chestnut, \$7.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, \$3.15; Hocking Valley, \$3; Youghiogheny, \$3.25; Illinois block, \$1.90@2; Brazil block, \$2.35.

Pittsburg.

August 11.

(From our Special Correspondent.)

Coal.—The supply in the lower markets, according to well informed parties, will be sufficient to hold out for the balance of the year. No further shipment by water is booked for some months. Prices so far have undergone no change. On account of the hot weather and the labor troubles the local demand has been very much restricted. Affairs along the Monongahela are very quiet; most of the mines are idle, and there is very little coal loaded either in the ports or harbor.

On the railroads business was active, with plenty of orders booked; cars, however, have been scarce. Coal blockades at the lake ports are still of frequent occurrence, causing numerous delays. The Allegheny Valley Railroad, which has heretofore not figured so prominently in coal shipments as it might, is forming an important outlet for north-bound coal, much to the gratification of shippers to Buffalo.

Connellsville Coke.—Shipments show a natural decrease, and interested parties are wondering when the bottom will be reached. The answer is, not until a settlement of the disputed wage question is reached, or the mills have become non-union. The Frick Coke Company blew out 300 ovens, and are preparing to put out about 750 more. The McClure Company, the next largest producers, is running on short time, and unless business improves very soon they will cut down their list of active ovens. The smaller operators continue to operate as usual.

Furnace orders are very scarce, but the foundry trade shows signs of improving. The demand for crushed coke continues to grow; prices are still quoted at the old figures.

The week's shipments aggregated 102,240 tons, distributed as follows, in cars: To Pittsburg, 1,650; points east of Pittsburg, 1,205; points west of Pittsburg, 2,825 cars; total, 5,680; Western shipments increased 125 cars; Eastern shipments decreased 19 cars; Pittsburg shipments decreased 150 cars; week's decrease 169 cars.

METAL MARKET.

NEW YORK, Friday Evening, Aug. 12, 1892.
Prices of Silver Per Ounce Troy.

Aug.	Sterling Exch. ge.	London. Pence.	N. Y. Cents.	Value of sil. in \$1.	Aug.	Sterling Exch. ge.	London. Pence.	N. Y. Cents.	Value of sil. in \$1.
6	4'88	38¾	84¾	'653	10	4'88	38¾	84	'650
8	4'88	38¾	84¾	'651	11	4'88	38¾	83	'642
9	4'88	38¾	84¾	'651	12	4'88	37¾	82½	'638

The silver market has made a new record for low prices this week, being quoted 57½ weak in London to-day, and selling at 82½ for certificates on Stock Exchange. Dull Indian Exchanges, unfavorable allotment of Council Bills, and continued pressure of silver for sale over and above purchases by our Government tell the whole story. The market closes demoralized and unsettled.

The United States Assay Office at New York reports the total receipts of silver for the week to be 106,000 ounces.

Government Silver Purchases.

WASHINGTON, D. C., August 12th.—(By Telegraph).—The Treasury Department purchased to-day 350,000 ounces of silver at '8293@'8298 per fine ounce.

Silver Bullion Certificates.
NEW YORK STOCK EXCHANGE.

Prices.		H.	L.	Sales.
August 6	84¾	84¾	84	95,000
August 8	84¼	84¼	84	20,000
August 9	84½	84½	84	115,000
August 10	84	84	84	131,000
August 11	84	82½	84	109,000
August 12	83½	82½	84	470,000

Gold and Silver Exports and Imports at New York.

	Exports.		Imports.	
	Week ending Aug. 6.	Since Jan. 1.	Week ending Aug. 6.	From Jan. 1.
Gold	\$1,070,000	\$50,850,373	\$9,239	\$6,621,040
Silver	133,424	12,843,539	36,230	1,080,401
Totals	\$1,203,424	\$63,693,912	\$37,101	\$7,701,441

All the gold exported with the exception of \$70,000 went to Havre as in the preceding week; the silver went to London. As yet the regular autumn movement of gold from Europe has not commenced, the small quantities imported during the last three weeks coming from the West Indies and South America.

At this time in 1891 there had been exported \$74,766,776 in gold and \$8,842,123 in silver, against imports of \$2,713,957 in gold and \$1,300,233 in silver.

NOTES OF THE WEEK.

President Harrison has appointed Senator Wm. B. Allison, of Iowa, Senator John P. Jones, of Nevada, Congressman James B. McCreary, of Kentucky, Henry W. Cannon, of New York, and General Francis A. Walker, of Massachusetts, as delegates to the International Silver Conference. Three English delegates have been named. They are Sir Charles Fremantle, Deputy-Master of the English mint, Sir William H. Houldsworth and Mr. Bertram Currie. The first two named gentlemen are, it is said, strongly in favor of bimetallism. It has also been announced that the Indian Government has selected General Richard Strachey and G. H. Murray of the Treasury as its representatives.

The most noteworthy event of the week was the remarkable drop in the price of silver on the 10th inst., when it sold at 82½ cents, the lowest price ever known. This fall in price, following the appointment of delegates to the conference, warrants the general belief held by financiers that the conference will accomplish nothing. And yet it may be that this weakness of silver may lead to some solution of the silver question. Recent cablegrams from Calcutta state that the decline in silver threatens to involve India in a serious financial crisis and leading Indian papers are advocating closing the mints to the free coinage of the white metal. At present prices the rupee is worth but 1s. 2d., which has caused a great shrinkage in the assets of Indian banks as well as in general values. Certainly if anything is to be done, now is the time to do it.

Domestic and Foreign Coin.

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

	Bid.	Asked.
Mexican dollars	65½	67
Peruvian soles and Chilean pesos	61	63
Victoria sovereigns	4.88	4.90
Twenty francs	3.88	3.90
Twenty marks	4.74	4.78
Spanish 25 pesetas	4.79	4.81

Copper.—The market for this article is lifeless, as all hands are holding aloof, manufacturers because

they have stocks sufficient to last a few weeks, while business is only steady, and producers because they cannot obtain their price (the smaller ones have sold out about everything they can turn out). At present, everything is in an unsatisfactory condition, but the future depends entirely on the action of the large Lake companies—if they press on the market with their accumulation, they will have to come down to current figures, while if they continue to hold firmly, manufacturers will, of necessity, pay the higher prices, as they will shortly be compelled to take in supplies, although they may not do so in so liberal a manner as usual, which action would still longer delay the looked for recovery. Casting copper is lower, if anything, carload lots being obtainable at 10½@65c., delivered. Arizona pig copper remains unchanged at the nominal quotations, no business being transacted. In London the market opened as it closed for G. M. B.'s and remained without change until yesterday, when it showed a decline of two sixths to £44 10s. @ 12s. 6d. for spot and £45 @ 2s. 6d. for futures, to-day's closing prices being £44 7s. 6d. @ 10s. and £44 17s. 6d. @ £45, with manufactured sorts quoted as follows: English tough, £46 @ £46 10s.; best selected, £48 15s. @ £49; strong sheets, £53 10s. @ £54; India sheets, £51 5s. @ £51 15s.; yellow metal, 5½d.

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

To Liverpool.—	Copper Matte.	Lbs.	
S. S. Naronic	3,860 bags	44,128	\$22,000
S. S. Gallia	2,579 "	275,492	14,000
S. S. Servia	2,228 "	240,250	12,000
To Hamburg.—	Copper Matte	Lbs.	
S. S. Augusta Victoria	8 bars bullion	500	\$1,900
To Rotterdam.—	Copper Matte.	Lbs.	
S. S. Dumbledam	36 casks.	68,943	\$7,584
"	246 bars.	44,899	4,939

Tin.—This metal has been very inactive, but the fluctuations have been wide, especially when early in the week London came almost £2 lower than the closing figures of last week. Consequently our market declined to 20'45 for spot and August and 20'65 for the last four months, reaching this point on Wednesday, since then the market has been steady, closing at 20'55 and 20'75. Speculators and consumers are not doing much owing to their uncertainty as to the future course of the market, and what the manipulations will next bring forth. The London market, which last week closed at £96 2s. 6d. @ 5s. for spot and £95 10s. @ 12s. 6d. for futures, opened at £94 15s. @ £95, and £94 7s. 6d. @ 10s. and declined until it reached £93 17s. 6d. @ £94 and closes at £94 @ £94 2s. 6d. for both spot and futures.

Lead.—Contrary to expectations that the consumers would come in and buy largely at low prices, they have not, and the market is consequently much weaker as the offerings have increased. While at the moment there is nothing that is likely to disturb the market, the fact that the low prices of silver will cause a reduction in production must not be lost sight of, even though the effect may not be felt for some time. The London market is quoted at £10 5s. for Spanish lead. Demand abroad for this, as all other metals, is slow.

Chicago Lead Market.—The Post-Boynton-Strong Company telegraph us as follows: The market is barely steady at 3.97½; with sales of 300 tons. The August demand is light.

St. Louis Lead Market. The John Wahl Company telegraphs us as follows: "Lead is quiet at 3'92½c. for both argentiferous and Missouri; chemical lead is 3'95c. Transactions this week have been of a retail character only."

Spelter gradually loses its strength, and the demand is falling off. We quote: 4'70 for comparatively early deliveries and 4'70 for the last few months of the year. In London, good ordinaries are worth £21 5s. and specials £21 7s. 6d.

Antimony is quiet but steady, Cookson's at 13½, L.X. at 12½ and Hallett's at 10½.

Nickel is also steady at 60c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Aug. 12, 1892.

The labor difficulties at Pittsburg are gradually being surmounted. The iron and steel manufacturers and the Amalgamated Association have reached an agreement. The rates for puddling and rolling will remain the same as they were last year, viz., \$5.50 per ton, except in the plate department, where there is to be a reduction of 60c. to 72c. Roll turners will receive \$3 a day. The situation at Homestead is very favorable for the Carnegie company. It is said that 1,400 men are at work there. At Union Mills there are 700 men working, and at Duquesne there is hardly a vacancy left. The building of houses for the new men inside the inclosure at Homestead Mills is proceeding rapidly, and a miniature town will be in existence shortly. As might be expected, the quality of the material turned out at Homestead is not yet up to the standard, but things will rapidly improve as time goes on.

Pig Iron.—The following tables give the estimated output of the blast furnaces for the week ending Saturday, July 30th, 1892, and for the first 30 complete weeks of the year 1892 up to and including July 27th, together with the output for the week ending Saturday, July 29th, 1891, and for the first 30 complete weeks of the year 1891 up to and including July 30th, 1891.

ESTIMATED OUTPUT OF BLAST FURNACES FOR WEEKS ENDING JULY 30TH 1892, AND JULY 29TH, 1891.

	Anthracite.		Coke.		Charcoal.		Total.	
	No. of furnaces in blast.	Output in gross tons.	No. of furnaces in blast.	Output in gross tons.	No. of furnaces in blast.	Output in gross tons.	No. of furnaces in blast.	Output in gross tons.
1892..	68	29,000	132	118,000	40	8,200	240	155,800
1891..	89	34,500	156	126,300	53	11,000	298	171,700

ESTIMATED OUTPUT OF BLAST FURNACES IN 1892 AND 1891 FOR FIRST 30 WEEKS UP TO JULY 28TH AND JULY 27TH, RESPECTIVELY.

	Anth'cite. Gross tons.	Coke. Gross tons.	Charcoal. Gross tons.	Total. Gross tons.
To July 28th, 1892.	1,059,697	4,085,142	322,715	5,477,856
To July 27th, 1891.	1,230,000	2,722,500	329,900	4,282,400

As will be seen from the figures in the above table, the rate of output of the blast furnaces continue to decrease. This decrease is not confined to one kind of pig or to one district, but is equally and universally distributed throughout the whole of the producing areas. At the same time the stocks continue to increase. The pig iron trade, and in fact the iron trade generally is in a bad and unsatisfactory state. In the New York district buyers of pig iron continue to limit themselves to monthly supplies, and hardly any contracting for longer periods is indulged in. The cutting of some Pennsylvania brands mentioned last week continue. Locally the trade in pig iron is just slightly better than last week and rather more iron, though in small lots, is going into consumers hands.

Spiegeleisen and Ferro-Manganese.—We hear of no important transactions in either of these lines this week. The price of ferro-manganese is getting weaker, and although dealers mention \$61 as the price, \$58 or even less is accepted for anything like a fair sized order.

Steel Rails.—The market for steel rails is exceedingly dull, and no new orders are reported. Neither does there appear to be any prospect of new orders for some time to come. According to the American Iron and Steel Association the total production of steel rails during the first half of 1892 was 865,128 net tons, as compared with 579,929 net tons during the first half of 1891, and 786,330 net tons during the second half of 1891.

Judging by the slackened demand, we expect that the production during the second half of this year will be much less than during the first half. The price is still \$30 at mill.

Rail Fastenings.—The trade in rail fastenings is as dull as that in steel rails, and nothing new is reported. Prices are as follows: Fish and angle plates, 1'55@1'65c., at mill; spikes, 1'90@2c.; bolts and square nuts, 2'50@2'70c.; hexagonal nuts, 2'70@2'80c., delivered.

Tubes and Pipes.—The business in tubes and pipes still continues dull, and prices cannot be stated with accuracy as there are no offers.

Merchant, Iron and Steel.—The quietness in this market is still apparent, and, except for agricultural machinery purposes, the demand is small. There is no variation in prices, which stand as follows: Mushet's special, 48c.; English tool steel, 15c. net; American tool steel, 6½@7½c.; special grades, 13@18c.; crucible machinery steel, 4'75c.; crucible spring, 3'75c.; openhearth machinery, 2'2c.; openhearth spring, 2'50c.; tire steel, 2'25c.; toecalks, 2'25@2'50c.; first quality sheet, 10c.; second quality sheet, 8c.

Structural Material.—The state of the market for structural material is very good. Orders are plentiful and deliveries are very slow. The mills have sufficient orders to keep them employed for some time. The number of new structures and buildings proposed to be built in the city is greater than ever. The Inman line is going to build a new pier in the North River and about 3,000 tons of structural steel will be required. The Housemiths' strike is now settled and the men will go back on the ironmasters' terms. The prices for all materials are stiffening and stand now as follows: Beams, 2'22@3c.; angles, 2'15c.; sheared plates, 1'90@2'10c.; tees 2'40@2'60c.; channels, 2'35@2'50c.; universal plates, 2@2'10c.; bridge plates, 2@2'10c.; all on dock.

Buffalo. August 11.

(Special report by Rogers, Brown & Co.)

The improved tone of the market noted last week still continues, without any signs of an advance in prices however. Iron is moving freely, the carload demand being large. The total consumption in this section is increasing slowly, but is not as yet sufficiently noticeable to attract the attention of buyers. The quotations given below are, in many instances, being shaded from 10 to 25 cents, terms cash f. o. b. cars Buffalo: No. 1 X Foundry Strong Coke Iron Lake Superior ore, \$15.25; No. 2 X Foundry Strong Coke Iron Lake Superior ore, \$14.25; Ohio Strong Softener No. 1, \$14.25; Jackson County Silvery No. 1, \$17.30; Jackson County Silvery No. 2, \$16.80; Lake Superior Charcoal, \$16.50; Tennessee Charcoal, \$17; Southern Soft No. 1, \$14.15; Alabama Car Wheel, \$19; Hanging Rock Charcoal, \$20.50.

Chicago. August 12.

(From our Special Correspondent.)

The mineral lands and claims in the Mesaha Range are proving attractive to capitalists, and last week incorporation papers were issued to the Itsaca Iron Company of Chicago. The land controlled by this company is said to be rich in mineral. The capital stock is \$5,000,000, and large blocks of it have been taken by prominent citizens here and in New York. The principal office will be in Chicago, with branches at St. Paul, Duluth and New York City. The fact that the Duquesne workmen went back to that mill in a body is practically another victory for the Carnegie Steel Company. This action self-expels them from the Amalgamated Association, and gives that firm two non-union mills. It is also a serious blow to the association, which will soon begin to lose prestige. The Lakeside Nail Company, running a large plant in this vicinity, resumed operations August 8th, with a full complement of men and plenty of orders. Resumption of rolling mills proceeds slowly, and the prolonged shut-down has witnessed a general cleaning up of stocks, which in itself is a most desirable point gained. Many orders are being withheld until mills start up, as consumers are of opinion that better terms will then be obtainable. Inquiry for finished material of all descriptions is moderately good, and a freer buying movement is expected by end of month. Crude iron is seasonably quiet, though the unexpected continually crops up and gives a semblance of some business being done.

Pig Iron.—The week has been a quiet one and although orders for local coke iron have been largely confined to small lots of 50 to 100 tons, several contracts for 1,000 tons and upward were placed. These latter were from an unlooked for quarter and desirable, as deliveries were not too extended. The continued weakness of Southern furnaces is not without its effect on local makers and slight concessions are the rule. Lake Superior charcoal iron remains dull, but values are stronger than on any other class, as most of the larger furnaces are well sold up. Some of the largest consumers of this metal have been smelting heavily and will soon be in the market for additional supplies. Southern iron of the lower grades is still being offered at such low figures that consumers are almost afraid to place orders. Some of the larger companies however are holding more firmly and refuse to meet this class of competition.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, \$16.55@17.00; Lake Superior coke, No. 1, \$14.50@15; No. 2, \$14@14.25; No. 3, \$13.75@14; Lake Superior Bessemer, \$16.50; Lake Superior Scotch, \$15.50@16; American Scotch, \$16.75@17.75; Southern coke, foundry No. 1, \$14.50; No. 2, \$13.25; No. 3, \$12.50; Southern coke, soft, No. 1, \$13.25; No. 2, \$12.50; Ohio silveries, No. 1, \$17; No. 2, \$16.50; Ohio strong softeners, No. 1, \$17; No. 2, \$16.50; Tennessee charcoal, No. 1, \$17; No. 2, \$16.50; Southern standard car wheel, \$20@21.

Steel Billets and Rods.—Inquiries for both of those specialties are quiet and price steady at \$24.50 for billets and \$34.50 for rods.

Structural Iron and Steel.—Demand for bridge material is good, and one railroad here which is elevating its tracks is obliged to use lumber temporarily, because of the mill shut-down. Angles and sheared plates are scarce and hard to get. Regular quotations, car lots f. o. b. Chicago, are as follows: Angles, \$2@2.25; tees, \$2.30@2.40; universal plates, \$1.95@2; sheared plates, \$1.95@2; beams and channels, \$2.25@2.50.

Plates.—An offer of \$2.10 rates on tank steel was not accepted, buyer claiming he could do better. Demand is improving for mill lots, and warehouse business is good. Steel sheets, 10 to 14, \$2.30@2.40; iron sheets, 10 to 14, \$2.20@2.30; tank iron or steel, \$2.10@2.15; shell iron or steel, \$2.75@3; firebox steel, \$4.25@5.50; flange steel, \$2.75@3.00; boiler rivets, \$4.00@4.15; boiler tubes, 2 1/4 in. and smaller, 60%; 7 in. and upward, 70%.

Merchant Steel.—Demand has eased up considerably, and orders from the implement trade are very light, as most of the season's contracts are placed. Tool steel is in fair demand. We quote tool steel, \$6.50 @ \$6.75 and upward; tire steel, \$2.10@2.20; toe calk, \$2.40@2.50; Bessemer machinery, \$2.10@2.20; Bessemer bars, \$1.75@1.80; open hearth machinery, \$2.40@2.60; open hearth carriage spring, \$2.25@2.30; crucible spring, \$3.75@4.

Galvanized Sheet Iron.—Demand is very active in mill lots and from stock and agents have difficulty in obtaining material. Discounts are steady at 7% on mill lots, and 6 1/2% off on Juniata, and 6 1/2% and 5% off on charcoal from warehouse.

Black Sheet Iron.—Inquiry continues good and many mills are unable to make deliveries earlier than November on the new business offering. Quotations remain steady at 2.90@2.95c. for No. 27 Common, f. o. b. Chicago. Steel sheets are 10c. higher. Dealers quote 3.10@3.20 from stock, same gauge.

Bar Iron.—There is a fair amount of inquiry, but actual orders are few, as most large consumers are evidently waiting until general resumption takes place before making contracts. Small lots for quick shipment are active. We quote 1.63@1.65c. Chicago. Warehouse demand is excellent at 1.90@1.95c. rates.

Nails.—Inquiry for wire nails is improving from mill, and price steady at \$1.70 Chicago. Jobbers quote \$1.80 from stock in less than carlots. Steel

cut are in active demand from factory at \$1.60, 30c. average, and from stock, \$1.75.

Steel Rails.—Demand continues light and is mostly for current requirements. The steel company here report some inquiry for fair sized amounts for late fall shipments. Light rails are in fair demand. Standard sections are unchanged at \$30. Other track supplies are moving quietly at \$1.70 for iron or steel splice bars; spikes, \$2.05@2.15 per 100 lbs.; track bolts, hexagonal nuts, \$2.65; square, \$2.55.

Scrap.—Stocks in dealers' hands are accumulating, and demand for anything under this caption is perfectly lifeless. Quotations are nominal. No. 1 railroad, \$15; No. 1 forge, \$14; No. 1 mill, \$9.50; fish plates, \$17; axles, \$19; horseshoes, \$15.50; pipes and flues, \$7; cast borings, \$6.50; wrought turnings, \$9; axle turnings, \$10.50; machinery castings, \$10; stove plates, \$8.50; mixed steel, \$10.60; coil steel, \$14; leaf steel, \$15; tires, \$14.50.

Old Material.—Demand is at the lowest ebb ever known in this market. We fail to hear of a single inquiry for iron rails, which may be nominally quoted at \$18. Old steel rails are held \$12@14, according to length and condition. Old car wheels are very dull at \$14.50@14.75.

Louisville. August 6.

(Special Report by Hall Brothers & Co.)

The market is still quiet and but few sales are reported for the past week. What orders have been offered were small, but they were taken at the lowest ruling prices. The market is so unsettled that even special concessions do not induce business, but are simply used to pull prices down further.

Hot Blast Foundry Irons.—Southern coke No. 1, \$13@13.50; Southern coke No. 2, \$12.25@12.50; Southern coke No. 3, \$11.75@12; Southern charcoal No. 1, \$16@17; Southern charcoal No. 2, \$15.00@15.50.

Forge Irons.—Neutral coke, \$11.50@12.00; cold short, \$11.25@11.50; mottled, \$10.75@11.

Car Wheel and Malleable Irons.—Southern (standard brands), \$20@21; Southern (other brands), \$18.50@19.50; Lake Superior, \$19.50@20.50.

Philadelphia. August 12.

(From our Special Correspondent.)

Pig Iron.—The reported adjustment of scale matters at Pittsburgh was received here yesterday without surprise. Forge has been very dull for a few days, but under the stimulus of a general resumption in the West, an improvement is probable. There is an abundance of iron at \$13@13.50. In foundries prices are firm and demand about as good as could be expected. No 1 is selling at \$15 and No. 2 at \$13.75@14.25. No Bessemer sales are reported.

Muck Bars.—Bars are selling well at \$25.25 to \$25.50, and, as stocks are lower, those needing prompt deliveries, of which there are a number, are not in a position to question prices.

Steel Billets.—Selling prices depend more on date of delivery than anything else. Sales are for small lots only. One lot sold yesterday at \$26, while for late delivery less than \$25 was named by a large maker.

Merchant Iron.—A good business is reported all around and it will probably continue. The expected resumption in the West will soon stop orders from there. Some orders were taken this week at mills for 1.80 early delivery. More business is offered than taken, but it is probable that mill men will now accept all the business they can get on a 1.70 basis, earliest possible delivery.

Skelp.—There are prospects for a good business very soon. Grooved is 1.65; sheared, 1.80.

Wrought Iron Pipe.—It is not likely that anything will affect wrought iron pipe quotations, because the demand is too far below producing capacity.

Sheet Iron.—There is what might be called a rush of business in all the Eastern sheet mills and new orders are taken only at firm prices, ranging from 2.40 to 3.50 for best refined.

Plate and Tank.—Prices have been again advanced, at least to buyers who want early deliveries, and there is increasing activity in all plate mills. Sales have been made at 2.10 for plates and angles. Beams, ties and channels have been advanced to 2.40 to late inquiries. Railroad requirements are just now very urgent.

Steel Rails.—Very little new business is reported. Quotations, \$30.

Old Material.—Iron rails are still quoted at \$19, \$20, and steel at \$16.

Scrap.—No. 1, R. R., \$17.

Pittsburg. August 11.

(From our Special Correspondent.)

Raw Iron and Steel.—The iron market continues in an unsatisfactory condition as could well be imagined, the changes of the week being scarcely perceptible. Values are the same as those that ruled the market at date of our last review. Of course, the producers of city furnaces and leading descriptions of iron and steel are making no special effort to secure business below the present quotations, and in many instances are averse to booking orders too far ahead at ruling prices.

But the close competition of the Southern furnaces has not been without its effect in rendering

values unsettled and uncertain. The Southern railroads, without exception, have made freight rates very favorable to Southern furnaces; this is a matter that Northern roads ought to follow, and thus assist the trade of the North at least.

The course of the market during the present year has been such that with each drop in prices buyers have looked forward to even better terms. It is the opinion of some well informed manufacturers that when all the mills again resume operations the consumption will be sufficient to absorb a huge portion of the accumulation of Bessemer and forge grades, and result in a renewed firmness of prices. The idle rolling mills and steel works through the country are gradually resuming operations, and this expansion of the supply of finished forms of iron and steel will probably have the effect of preventing any further increase in prices.

Many of the active mills since the first of July have secured orders sufficient to keep them employed until the fall trade opens, so that with many plants out of the market there should be plenty of work for the others. Consumers are not supposed to place many orders for material that is not actually required for immediate wants, believing that a few weeks will see quotations at the rates previously prevailing. It is now the time of the year when trade drags along slowly and spiritlessly; animation is as lacking as though it were a dead factor and nothing occurs to indicate life but frequent reports of small transactions.

The time, however, is not far off when some improvement ought to be perceptible, as trade usually commences to manifest symptoms of awakening activity during the closing days of August. It is to be hoped that a departure from this rule will not have to be recorded this year. While production has been diminishing the pace was too slow to produce the necessary effect. It is true that when the resumption of activity by the pig-iron consumers occurs a more significant draught will be made on the production.

The decline in the price of Bessemer pig since the first week in January amounts to \$1.75@2 per ton; Grey Forge, 75c. @ \$1.25 per ton, and notwithstanding the fact that radical economies have been introduced by the producers the reduction brings the price unpleasantly close to the cost of producing. The latest, since the above was written: The Amalgamated Association, after ascertaining, beyond a doubt, that the scale would never be signed in its present shape, made reductions that were accepted by the manufacturers, and the scale will be signed this week. The settlement is all that saved the other Pittsburg mills from being non-union. The price of puddling is to remain at \$5.50. A reduction of 12 cents on plate rolling and 10 per cent. on finishing. The termination of the deadlock affects about 15,000 men in the Pittsburg mills. Work will likely be resumed next week, at least in some of the mills. The signing the scale will make no change in the mills of Carnegie & Co., who will all remain non-union, whose workmen have and will sign the company's scale which terminates January 1st, 1894.

Coke Smelted Laxe and Native Ores.

2,500 Tons Bessemer.....	\$14.90 cash.
2,000 Tons Bessemer.....	13.90 cash.
2,000 Tons Grey Forge, prompt.....	12.75 cash.
1,500 Tons Grey Forge.....	12.75 each.
1,500 Tons Grey Forge.....	12.60 cash.
1,000 Tons Grey Forge.....	12.50 cash.
1,000 Tons Bessemer, at Valley furnaces.....	13.25 cash.
1,000 Tons Bessemer, at Valley furnaces.....	13.25 cash.
750 Tons Grey Forge.....	12.75 cash.
500 Tons Bessemer.....	14.00 cash.
500 Tons Bessemer.....	13.85 cash.
500 Tons Bessemer.....	14.00 cash.
500 Tons Grey Forge.....	12.50 cash.
250 Tons No. 1 Foundry.....	14.75 cash.
200 Tons No. 2 Foundry.....	13.75 cash.
100 Tons Open Mill.....	12.00 cash.
100 Tons Silvery No. 1.....	16.50 cash.

Charcoal.

125 Tons Cold Blast.....	26.50 cash.
75 Tons No. 2 Foundry.....	20.00 cash.
75 Tons No. 1 Foundry.....	20.00 cash.
50 Tons No. 3 Foundry.....	19.00 cash.
50 Tons Warm Blast.....	19.25 cash.

Steel Slabs and Billets.

1,500 Tons Billets, Aug., Sept., at works.....	24.25 cash.
500 Tons Billets, spot.....	25.00 cash.
500 Tons Billets, spot.....	24.75 cash.
500 Tons Billets.....	24.50 cash.
350 Tons Billets, spot.....	23.00 cash.

Muck Bar.

450 Tons Neutral.....	25.00 cash.
350 Tons Neutral.....	24.75 cash.
200 Tons Neutral.....	25.00 cash.
100 Tons Neutral, prompt.....	24.75 cash.

Ferro-Manganese.

80 Tons 80%, Seaboard, foreign.....	57.50 cash.
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Steel Skelp.

500 Tons Wide Grooved.....	147 1/2 fm.
250 Tons Wide Grooved.....	165 fm.
150 Tons Sheared Iron.....	185 fm.

Lake Champlain Billets.

575 Tons Champlain Billets.....	25.00 cash.
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Sheet Bar.

250 Tons Sheet Bars, del. Wheeling.....	29.25 cash.
125 Tons Sheet Bars, del. Cleveland.....	29.50 cash.
100 Tons Sheet Bars, Pittsburg.....	30.00 cash.

Old Iron and Steel Rails.

550 Tons Old Steel Rails.....	15.75 cash.
500 Tons Old Iron Rails, mixed lengths.....	15.50 cash.
500 Tons Old Iron Rails, Youngstown.....	19.00 cash.
250 Tons Old Iron Rails, Youngstown.....	19.25 cash.

Scrap Material.

500 Tons No. 1 R. R. W. Scrap, net.....	15.00 cash.
250 Tons No. 1 R. R. W. Scrap, net.....	15.50 cash.
100 Tons Cast Scrap, gross.....	12.25 cash.
100 Tons Iron Car Axles, net.....	22.50 cash.
25 Tons Hammered Axles, net.....	24.00 cash.

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

Main table of New York Mining Stocks Quotations, divided into Dividend-paying and Non-dividend-paying mines. Columns include Name and Location of Company, dates from Aug. 6 to Aug. 12, and Sales.

*Ex-dividend, †Dealt in New York Stock Ex. Unlisted securities. ‡Assessment paid, §Assessment unpaid. Dividend shares sold, 9,640 Non-dividend shares sold, 8,275. Total shares sold, 17,885.

BOSTON MINING STOCK QUOTATIONS.

Table of Boston Mining Stock Quotations, listing company names, dates from Aug. 5 to Aug. 11, and sales figures.

* Ex-dividend. Dividend shares sold, 2,849. Non-dividend shares sold, 1,564. Total shares sold, 4,413.

COAL STOCKS.

Table of Coal Stocks, listing company names, dates from Aug. 6 to Aug. 12, and sales figures.

Total shares sold, 306,149.

San Francisco Mining Stock Quotations.

Table of San Francisco Mining Stock Quotations, listing company names and closing quotations from Aug. 5 to Aug. 11.

DIVIDEND-PAYING MINES.

NON-DIVIDEND PAYING MINES.

Main table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES (No., Par), ASSESSMENTS (Total levied, Date and amount of last), DIVIDENDS (Total paid, Date and amount of last), NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES (No., Par), ASSESSMENTS (Total levied, Date and amount of last).

G., Gold, S., Silver, L., Lead, C., Copper, B., Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood 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 \$11,000,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$190,000 before the reorganization in 1880. ††† This company acquired the property of the Raymond & Ely Company, which had paid \$3,075,000 in dividends. †††† Previous to this company's acquiring Northern Belle, that mine declared \$2,400,000 in dividends, against \$425,000 in assessments.

STOCK MARKET QUOTATIONS.

Table with columns for company names and prices. Includes Aspen section with companies like Agnes C., Argentinum Juniata, Aspen Deep Shaft, etc.

Table with columns for company names and prices. Includes Baltimore, Md. section with companies like Atlantic Coal, Bait & N. C., Big Vein Coal, etc.

Table with columns for company names and prices. Includes Pittsburg, Pa. section with companies like Allegheny Gas Co., Bridgewater Gas Co., Chartiers Val. Gas, etc.

Table with columns for company names and prices. Includes Deadwood section with companies like Bullion, Caledonia, Calumet, Cambrian, Carthage, etc.

St. Louis. Aug. 10. The closing quotations were as follows:

Table with columns for company names and prices. Includes Adams, Colo., American & Nettie, Colo., Bi-Metallic, Mont., Central Silver, etc.

Helena, Mont.

Table with columns for company names and prices. Includes Bald Butte (Mont.), Benton Group, Mont., Bi-Metallic, Mont., California (Castle), Mont., etc.

Foreign Quotations.

London. July 30.

Table with columns for company names and prices. Includes Alaska Treadwell, Amador, Cal., American Belle, Colo., Appalachian, N. C., Can. Phosphate, Can., etc.

Paris. July 28.

Table with columns for company names and prices. Includes East Oregon Ore, Forest Hill Divide, Cal., Golden River, Cal., Laurium, Greece, Lexington, Mont., etc.

CURRENT PRICES.

Table with columns for chemical and material names and prices. Includes Acid-Acetic, No. 8, pure, 1.040, Chromic, chem. pure, Hydrobromic, dilute, U. S. P., Hydrocyanic, U. S. P., Hydrofluoric, etc.

Table with columns for material names and prices. Includes Marble Dust, Metallic Paint, Mineral Wool, Ordinary rock, Mica, Naphtha, Nitre Cake, Ochre-Rochelle, etc.

THE RARER METALS.

Table with columns for material names and prices. Includes Aluminum, Arsenic, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Glucinum, Indium, Iridium, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Niobium, etc.