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UNDERGROUND PHOTOGRAPHY.—ILLUSTRATED SUPPLEMENT.

In this issue we again present in supplement form some further illustrations of our series representing Cornish tin mining. The photographs from which these illustrations are reproduced are remarkably clear even for outdoor work, and when it is remembered that they were taken underground by means of a flash light, their excellence is still more worthy of note.

THE MONTANA COPPER COMPANIES.

Under a recently enacted law mining companies operating in the State of Montana are required to render to the State assessors a duly certified statement showing their gross and net receipts, expenditures, ore raised and cost of production, which statement serves as a basis for taxation. In the last number of the "Journal" we published some of these reports, which have been filed for the year lately closed. In the present condition of the copper market it will be interesting to examine these reports a little more closely.

The Boston & Montana Company certifies that the net proceeds of the mines for the year ending June 30th was \$217,310; the Montana Ore Purchasing Company, \$15,000; W. A. Clark's properties, owned or leased, about \$5,000. The Colorado Smelting and Mining Company shows a loss of \$75,403, largely due, in all probability, to the destruction of its smelting plant by fire. All the other copper mining companies whose reports have been made public, including the Parrot, also show a loss on their year's business. The most interest, however, will be attached to the report of the Anaconda Mining Company. This great corporation reports its total receipts for the year, \$11,131,731; total expenses, \$8,303,642; leaving the net profit \$2,828,089. It is hardly to be supposed that this \$2,800,000 was divided among the stockholders of the company, but it is generally understood that a large proportion of the net receipts was expended in new developments and in the sinking of the Anaconda and other shafts, which, as is well known, are going down to at least the 1,500-ft. level.

Another interesting statement shows the comparative cost of mining in different properties reporting. It is impossible to say what is included in the cost of mining; that is, whether development work is or is not included, or whether the cost in any or all cases simply includes the expenditure for raising ore and timbering, but the following table is, in any event, of interest:

Table with 4 columns: Property Name, Tons, Cost of Mining, Cost per ton. Colusa-Parrot... 16,640 tons, \$52,840 cost, \$3.18 per ton. Elm-Ore... 305 tons, 665 cost, 2.18 per ton. Black-Rock... 2,795 tons, 13,255 cost, 4.74 per ton. Parrot... 53,155 tons, 184,573 cost, 3.47 per ton. Original... 9,405 tons, 40,805 cost, 4.33 per ton. Glengarry... 17,000 tons, 51,400 cost, 3.00 per ton. Moulton... 940 tons, 7,403 cost, 7.87 per ton.

It will be seen from this table that the average cost of mining as reported by the operators was \$3.29 per ton. In the "Mineral Industry" for 1893 Dr. Ledoux estimates the average cost of mining copper ore in Butte as \$3 per ton, showing a very close approximation to the actual result as shown in these reports.

It is to be regretted that the managers of so important a company as the Anaconda see fit to make no detailed report, and to refuse to give the mining world information which would be of the greatest interest. In Massachusetts at first—and the example has been followed in other States—the legislature required the railroad companies to furnish full reports of their operations, which were open to inspection. The results have been in every way beneficial to the companies themselves as well as their stockholders. While the case of a mining corporation is not quite the same as that of a railroad, the State has the authority to require reports of the companies organized under its laws, and it would be well to do so in the interest of the stockholders at least. In Montana the object has been purely to get the information required for taxation; but the scope of the report might well be extended.

CONGRESS AND THE JUDICIARY.

Now that the reign of DEBS is over, it may be worth while to call attention to one or two preceding events which invited and encouraged it.

The first of these was the practical victory of the DEBS strike on the Great Northern Railway.

Inspired by this success, the American Railway Union prepared to attack the Northern Pacific, which was in the hands of receivers, and therefore of the Federal Court; but this plan was frustrated by the injunction of Judge Jenkins, which I have discussed in a former article. The question, whether this injunction was proper under the law, ought, of course, to be determined by a higher court, upon appeal; and when the legal question had been thus authoritatively settled it would be the proper province of Congress to decide whether additional legislation were necessary.

But the politicians were in too great a hurry to "conciliate the labor vote," to wait for such developments. In March last the Judiciary Committee of the House was authorized to "speedily investigate and inquire... whether in any of said matters or things the Hon. J. G. Jenkins, judge of said court, has exceeded his jurisdiction in granting said writs,

abused the powers or process of said court or oppressively exercised the same, or has used his office as judge to intimidate or wrongfully restrain the employees of the Northern Pacific Railway Company, or the officers of the labor organizations with which said employees or any of them were affiliated in the exercise of their rights and privileges under the laws of the United States; and, if so, what action should be taken by this House or by Congress."

After investigation by a sub-committee, the majority of the Judiciary Committee reported, June 8th, to the effect that the testimony failed to show any corrupt intent on the part of the judge, and that "it is altogether possible that he sincerely believes the orders granted by him were sanctioned by law and a legitimate exercise of his jurisdiction," and therefore that there is "no sufficient ground for any proceedings against him." But the report recommended a resolution censuring him for "an oppressive exercise of the process of his court," and "an abuse of judicial power"; in other words, it proposed to punish by censure a conscientious judge, because his view of the law differed from the view held by the majority of a Congressional committee.

This was an arrogant attempt on the part of the legislative branch of the government to overawe the judiciary, and a plain notice to DEBS and his associates that, if the Courts should undertake to interfere with their performances, Congress might be relied upon to back up "labor" against law. Whether the Committee or the Judge was right as to the legal questions involved, is quite irrelevant. It was his business, not theirs, to declare the law. If they could find grounds for impeaching him as corrupt, that was within their power and duty. In the absence of any trace of such grounds, their denunciation of him was a cowardly and mischievous attack on the independence of the bench, and a bid for the favor of the mob.

DEBS may well complain that the Hon. Mr. BOATNER and his associates in the House Judiciary Committee misled him into the course which ended in his overthrow. Encouraged by their official utterances, he planned the great coup by which the American Railway Union was to dictate terms to the throttled commerce of a continent. It is easy to see that he acted, at least in his first steps, "under legal advice," and followed the lines laid down by the Committee, expecting thereby to be able to avoid or defy the interference of the courts.

Fortunately for liberty and order, the Federal judges showed themselves superior to intimidation by Congress; the President and the Attorney General supported them; and the people, with an overwhelming unanimity of sentiment, approved the stern resistance thus offered to rebellion in its latest form. Congress is not likely to impeach or censure anybody now. The situation has changed. The DEBS vote is not now worth crawling after, even in the estimation of a demagogue. And the majority of the Judiciary Committee of the House of Representatives may be thankful that the effect of their folly was counteracted by the patriotism and courage of other men.

R. W. RAYMOND.

THE NEW TARIFF BILL.

The deadlock between the two houses of Congress on the Tariff Bill came unexpectedly to an end this week when the majority in the House decided to drop the original Wilson bill and accept the Senate amendments. This was promptly done, the bill passed and sent to the President, who has not yet signed it, though there seems to be no doubt that he will approve it, or at least allow it to become a law. As the date set in the bill was August 1st, there seems to be no doubt that it will take effect immediately on its approval.

The House followed up its action by passing separate bills placing on the free list coal, iron, barbed wire and sugar. These were at once sent to the Senate, where they have been referred to the Finance Committee. Their fate is very doubtful, and it seems now most probable that they will not be acted on at the present session.

As our readers already know, two of the chief features of the original bill were the placing of coal and iron on the free list. This is changed in the amended bill, which retains a duty on both, but reduces that on iron ore from 75 to 40 cents, while coal imports will pay 40 cents per ton for lump or run-of-mine and 15 cents for slack and dust. Coke is charged with 20 per cent. ad valorem. As noted above, the removal of these duties is provided for by a separate bill, which has passed the House, but whose fate in the Senate is still very doubtful.

In the iron and steel schedules the bill is a compromise, as in many other points, but it is clear that the reductions made are not sufficient to permit imports except on a few special articles, or perhaps to Pacific coast ports. Taking the leading articles in this schedule we find that pig iron is put at \$4 per ton, the old rate being \$6.72. Bar iron is dropped from 0.9 to 0.6 cent per pound, and the same change is made on beams. On steel ingots the reduction is about one-third, the new rates varying from 0.3 cent on metal valued at 1 cent per pound, up to 4.7 cents where the value is 7 cents or over. Wire and wire rope are also reduced about one-third, as are castings of all kinds, the duty on the latter remaining at 0.6 cent. Tin plates are subjected to a sharp reduction, from

2.2 to 1.2 cents per pound. This change will not take effect until October 1st.

Steel rails are reduced from \$13.44 to \$7.84 per ton. This is a change which might have had an effect at one time, but at the present will have none whatever. Our latest quotations from European railmakers put the prices of heavy rails at \$19 to \$31 per ton, the lowest price being at the Belgian Works. Our makers have shown that they could meet this, even without allowing for freight, insurance, and the other charges which must be paid, were there no duty.

In the other metals the changes are, in some cases, of importance. Copper is reduced from 35 to 20 per cent.; in this case the change is not important, as we are furnishing so large a share of the copper supply of the world, and are not likely to take the metal from abroad in any event.

Tin goes back upon the free list, the duty of four cents imposed by the present law being dropped.

Zinc or spelter is reduced from 1½ cents per pound to one cent, while in sheets or manufactured form the duty is reduced one-half, from 2.50 to 1.25 cents. Our last week's quotations gave the price of spelter at 3.40 cents in New York and 3.50 in London, so that no immediate effect could be expected from the reduction.

The duty on lead is cut exactly in two. The new bill provides for 1 cent per pound on pigs and bars; 1.25 cents on pipe and other manufactured forms; 0.75 cent on lead contained in silver and other ores, the old rates being 2 cents, 2.5 cents and 1.5 cents respectively. This rate will affect the market at once, as the difference between London and New York prices has been in recent weeks from 1.25 to 1.40 cents.

We have thus given a general outline of the more important points in the bill. Its effects time will show much better than any predictions of ours. We do not believe, however, that the changes will result in any great change in our commercial relations with foreign countries. The passage of the separate bills for the removal of the duties on coal and iron ore is very doubtful; we have already discussed the results should those changes be made.

The important point at present is that a settlement has at last been reached which is likely to last for several years at least. Our miners and manufacturers know where they stand, and they can, without further hesitation, go to work at once to utilize our unrivaled natural advantages and to take their part in the return of prosperity, whose coming has been apparent for some time, and which has now nothing to delay its coming.

NEW PUBLICATIONS.

HANDBUCH DER METALLHUTTENKUNDE: ERSTER BAND. KUPFER, BLEI SILBER, GOLD. By Dr. Carl Schnabel. Berlin, Germany; Julius Springer. Pages 914; with 571 illustrations. Price (in Berlin), 24 marks.

I. COPPER.

Dr. Schnabel's "Handbuch der Metallhuettenkunde" is one of the latest and most prominent additions to German metallurgical literature. The volume that has already appeared is devoted to the four important metals that frequently occur in combination: Copper, lead, silver and gold. That this work is mainly intended as a textbook for students must be evident from the fact that all the other metals excepting iron are treated of in two volumes. In the present state of metallurgy, it would take as much space as this to thoroughly exhaust a single one of the more important metals, such as copper or silver. Hence such a condensed handbook can be little more than a compilation; a most thankless task, and one that leaves the author peculiarly open to criticism. Books compiled by professors of metallurgy are very apt to be largely filled with absolutely experimental methods that possess only an historical interest; while the processes of to-day are slighted, owing to the difficulty of obtaining reliable details about them. English metallurgical literature contains several shining examples of this character—books that devote many pages to a detailed description of smelting in Japan (never seen by the author), while the most important methods and works, producing a considerable proportion of certain of the world's metals, are dismissed in a few paragraphs of general statements. The inference is obvious; such an author uses such information as he can conveniently gather by personal observation at home and by such essays or papers as may be sent him by pupils or engineers in foreign countries, selecting especially those that appeal to his antiquarian tastes. But a book constructed on these lines should not be entitled a "general metallurgy."

Professor Schnabel has entirely avoided this error. Having had practical charge of extensive metallurgical operations before he became an instructor, he fully realizes how little practical men care for obsolete methods, except as a branch of antiquarian study. And having had recent opportunities to make an extensive trip through Australia and the United States, he has visited most of the works in operation, and studied the most modern practice on the spot. This is the first German work the writer ever had the pleasure of seeing that does anything like proper justice to modern American practice. Few of us can understand why foreign metallurgical books and monographs are filled with long and detailed descriptions of European works, producing perhaps 300,000 to 500,000 lbs. copper per year, while American works turning out 100,000,000 lbs. annually are ignored. Pages are filled with directions how to make, and tamp in the brasque crucible and forehearth of a copper-ore furnace; and whereas in the United States we simply do not use brasque at all, nor have we for 15 years, except under peculiar conditions. With the wages and material reduced to a common share, the money earned per ton of ore by giving up this expensive and dirty material will go far toward paying the entire cost of handling and changing the ore at one of our large furnaces provided with modern mechanical appliances. The simple

reason for this apparent inattention to outside progress is that the development and improvement of metallurgical processes with us has been so rapid that it has not been generally realized abroad.

The series of metallurgical works by practical men published by the Scientific Publishing Company has awakened much interest among technical men in other lands, and a glance at the portion of Professor Schnabel's book that treats of the metallurgy of copper will show how important a role our smelters play in the practice of the day. The articles contain 275 pages, of which 184 are devoted to the dry methods of treatment, 50 pages to wet methods (except by electricity), and 25 pages to the electrolysis of copper. The first 16 pages also are occupied in discussing the physical and chemical properties of copper, in describing its most important ores. An excellent feature of Dr. Schnabel's work is his descriptions and comparisons of the two great methods of treating copper ores (the German and English practice), and his discussion and explanation of the furnace reactions and results that occur during these processes. This description of the reactions occurring in these two great methods (pages 16 to 22, 85 to 87), though it necessarily contains nothing new, is masterly in arrangement and condensation, and worthy of the study of all interested in the subject. It is the description of a practical metallurgist familiar with theoretical chemistry, and not, as is often the case, that of a practical chemist familiar with theoretical metallurgy.

The employment of the term "roasting" instead of "calcination" leads to confusion in all American and European treatises on copper smelting. The term "roasting" has already been "pre-empted" for a century or more for an operation peculiar to the English process of copper treatment, the slow melting down of pigs of matte at a very low temperature, so that the gradually liquifying sulphides may be exposed drop by drop to an air current for the purpose of oxidation. The term "calcination" is an excellent one, and too familiar to require explanation. It would save much confusion if writers would agree to make this distinction. The important subject of calcination is well handled. As is appropriate in a country where all sulphurous fumes must be condensed, the calcination of ores in kilns and shaft furnaces comes in for much more elaborate treatment than calcination in heaps, which is still so important (and so often carelessly executed) in portions of America. The mechanical calcining furnaces are fairly described and illustrated, though there is always a lack of exact figures of cost and results, which alone interest the practical metallurgist when he picks up a new book relating to his profession. Indeed, any attempt to review each section of this excellent article on copper would only lead to a repetition of the above remarks. The compilation is excellent and pretty much up to date. It is made up largely from the best known and most modern authors (and their illustrations) re-enforced by information gleaned by the author on the spot. An excellent discussion of the ordinary methods of copper extraction and a general description of the electrolysis of copper conclude this article.

It is impossible within the limits that the author has established for himself, to give those accurate details of cost of construction and of every item of the mining expenses, which are so useful to the smelter. Hence this book can have little value to the educated, practical metallurgist. He already knows pretty much all that Dr. Schnabel has to tell him, and looks eagerly for that which he knows he cannot expect to find. But for the student this seems to me to be by far the most useful and comprehensive textbook that the literature of copper has seen since the works of Rivot and Keal have become antiquated. It is a silent but eloquent protest against the method of teaching a student metallurgy which prevailed when I studied in Germany; when it was the common practice to lecture to a class of young men for several hours on some smelting process, with great detail and enthusiasm, and after our notebooks were well filled and we had acquired the firm belief that we at least had a pretty fair knowledge of one process that we could rely on to stand by us in days of adversity and refractory ores, the professor would conclude with: "But this method, gentlemen, is obsolete and has been long superseded by more economical and satisfactory processes" (of which we seldom received any useful details).

The printing, paper and general appearance of Dr. Schnabel's book are excellent. It is a pity that its general correctness should be marred by a misspelled title on page 159 and several following pages. As a rule the proof-reader has been most careful, and the many foreign names show scarcely a single error. It is a book that all students of metallurgy will desire to own, study and digest.

E. D. PETERS, JR.

BOOKS RECEIVED.

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

Poor's Manual of Railroads; 1894. H. V. & H. W. Poor. New York. Pages 1,800, with 70 maps. Price \$7.50.

Programme of the Royal Technical High School at Aachen for the Term Year, 1894-95. Aachen, Germany; published by the School. Pages 126.

American Street Railway Investments; Supplement to the Street Railway Journal. The "Street Railway Journal," New York. Pages 156, with Maps. Price \$5.

Building Construction in Metals; Iron and Steels. By Prof. J. Denfer. Paris, France; Gauthier-Villars & Fils. Pages 584; illustrated. Price (in New York), \$6.

Engineering Construction in Iron, Steel and Timber. By William Henry Warren. London and New York; Longmans, Green & Co. Pages 380; illustrated. Price \$5.

Iowa Society of Civil Engineers and Surveyors: Proceedings of Sixth Annual Convention. Des Moines, Iowa; published for the Society. Pages 48; illustrated. Price 50 cents.

The Development and Transmission of Power from Central Stations. By William Cawthorne Unwin. London and New York; Longmans, Green & Co. Pages 312; illustrated. Price \$3.50.

A Course on Railroads adopted at l'Ecole Nation'le des Ponts et Chaussées. Volume I. Construction—Roadbed and Track. By C. Bricks, Chief Engineer of the State Railroad Line. Paris, France; Gauthier-Villars & Fils. Pages 694; illustrated. Price (in New York), \$6.

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.

An Aluminum Phosphate Mineral.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I have read with interest the description given by Mr. Montgomery in your issue of March 31st of a new aluminum phosphate mineral, and beg to send you the following notes on a similar mineral described before the Royal Society of Queensland.

The mineral which forms the subject of these notes was first observed by me several years ago occurring in the altered sedimentary rocks exposed in the road cutting in Adelaide street, Brisbane, close to Petrie's Bight, which have been evidently subjected to considerable local disturbance. The only other place in the neighborhood where it is said to occur is in the end of the railway tunnel close to Creek Street, but I have received no evidence of this statement.

Several very fine specimens of a somewhat similar mineral were recently received at the Queensland Museum from Mr. Aird, of Sea Hill, who obtained them from the Kepple Rocks.

As far as I am aware no description of it has been hitherto published in Australia, but that it has attracted attention may be concluded from the fact that for some time past specimens have been received by me for determination, from the workmen engaged in excavation, and from foot passengers passing the spot. Their curiosity had doubtless been attracted by the beautiful color which the substance exhibits.

The following is a description of its different physical and chemical properties: This mineral generally occurs filling and lining the joints and small cavities in the inclosing rock. In several instances it occurs in isolated patches in these joints, the intervening space being occupied by an earthy, ferruginous substance, and except in such cases it adheres firmly to the matrix.

It is met with in an amorphous compact form without any trace of cleavage, also less frequently as mammillated, botryoidal, stalactitic and incrusting masses. It is brittle and has a smooth sub-conchoidal fracture with a tendency to break into thin flakes (one isolated piece possessed a somewhat granular fracture when broken), luster dull, but sometimes waxy on the surface of the encrusting mass. It varies in color from apple green to dark sea green, and several of the specimens obtained were spotted and streaked with white. Sub-translucent in thin edges. The hardness varies from 4 to 5. The specific gravity is 2.6. It appears to bleach on exposure and decomposes forming a white, pulverous substance.

Small fragments heated in the closed tube yield water and assume a pale lavender color. It is slightly attacked by acids; gives no coloration to the flame when moistened with sulphuric acid; when heated in charcoal decrepitates; is infusible, and with microcosmic salt gives a faint reaction for iron (lead saturated) only. The powdered mineral on charcoal when moistened with cobalt solution gives the usual reaction for alumina. From repeated tests the color of the mineral appears to be due to the presence of vanadium.

A quantitative analysis by Mr. E. Hall, F. C. S., Albert street, gives the following result:

Phosphoric acid.....	48.25
Alumina.....	29.07
Vanadium.....	Trace
Loss in ignition (OH ₂).....	23.61
	100.98%

From the above analysis it appears that this mineral is a hydrous phosphate of alumina with a formula approximating to 4Al₂O₃, 5P₂O₅ + 18H₂O. It is distinguished by several characters from the aluminum phosphates described by Dana, but somewhat resembles turquoise. The specimens received from the Kepple Rocks possessed a hardness of 5 to 5.5 and were susceptible of a high polish.

QUEENSLAND MUSEUM, Brisbane.

H. G. STOKES, F. G. S.

ANTHRACITE COAL ON PERKIOMEN CREEK, PA.*

By Prof. O. C. S. Carter.

"A vein of coal 20 in. thick has been recently discovered on the Shirley farm at Arcola Station, on the Perkiomen Railroad, about 25 miles from Philadelphia. The vein is located near where the Skippack creek empties into the Perkiomen creek. An expert miner has been working on the vein for three weeks, and pronounces the coal of fine quality. A company is being formed for the purpose of working the coal. There are a number of smaller veins in the immediate vicinity, and it is thought that coal can be mined in large quantities on this and the adjoining farms. Several mining experts from Pottsville were at Arcola and examined the outcroppings of coal, and pronounced the indications the very best. Work has been temporarily suspended on account of the water flowing in from the creek."

The above notes of January 6th, 1894, are from local newspapers. A visit to the locality showed that the coal seam is found at the base of a high hill, which slopes steeply to the Skippack Creek, near where it empties into the Perkiomen. The rock in the vicinity is red sandstone of triassic age, and numerous exposures along the Skippack show that it dips gently at angles of from 12° to 15°. The sandstone is not a conglomerate, but is similar to that seen along the Schuylkill from Norristown to Phoenixville. At the base of the hill, on a level with the creek, is found a bed of hard, black carbonaceous slates. These are conformable with the sandstone, but the line of contact is sharp. These slates contain iron pyrites, and many pieces show a play of colors like iridescent coal. The sandstone resting on the slates is over 100 ft. in thickness. The coal is found in the slate, about 4 ft. from the top of the slate bed. The coal seam is said to be 26 in. thick at the widest part, but gradually thins out until it becomes 1 in. thick. Coal outcrops along the banks of the stream near

* Abstract of paper in the "Journal" of the Franklin Institute, Philadelphia.

the water-line; about one ton had been taken out. It was known many years ago that there was coal in the hill, and 50 years ago Mr. Peters, who then owned the farm, ran a shaft through the hill for a distance of 100 ft.; it was kept on an incline so as to drain off the water. In the middle of this passageway they sank a shaft 10 ft. deep. The shaft unfortunately was in the sandstone and did not reach the slate, which holds the coal. This old shaft is now filled up. An examination of the slate and coal thrown out failed to show any fossils. Several specimens of coal were secured for analysis. It is a hard, compact and lustrous anthracite. Analysis gave: Volatile and combustible matter, 6.50; fixed carbon, 62.84; ash, 30.60. This sample contained some slate, which accounts for the high percentage of ash. An analysis of another specimen much purer, which showed it to be a good coal, was: Water, 0.95; volatile and combustible matter, 5.73; fixed carbon, 83.80; ash, 9.50.

Near Arcola a red and white sandstone is found containing irregular patches of black carbonaceous matter. A similar occurrence has been noted at Three Runs, near Ambler.

There are other instances of the occurrence of coal in Montgomery County. In the new red sandstone at Norristown a seam of coal 1 in. thick was found. It extended for a few feet only, and was not wide. It was found about 12 ft. below the surface, while grading the street. The striated stem of a fossil plant was found in the sandstone. This coal was of a deep black color, pitchy in appearance, very brittle and broke with a conchoidal fracture.

At Gwynedd, in the new red, is found a bed of carbonaceous shale, colored black by traces of coaly matter which it contains. In Lower Providence Township, about one-half mile west of the Trooper, was found a seam of coal 3 in. thick. It was used by the village blacksmith. During the summer of 1833, men working upon the new tunnel at Phoenixville discovered a 2 in. seam of coal in the sandstone. It may be that a patient examination of these so-called triassic slates, which underlie the sandstone in Montgomery County, will disclose beds of workable coal in more than one locality. No systematic search has ever been made for coal, and very few deep artesian borings have been made in the new red in the county. In drilling the deep artesian well at Lansdale, a bed of black carbonaceous slate was passed through, and under these slates was found a bed of coal. A thick bed of coal was passed through in drilling an artesian well at North Wales at a depth of 150 ft. The triassic rocks have yielded large quantities of good coal in Virginia and North Carolina. In the earliest days of coal mining more coal was taken from the red sandstone rocks of the Richmond basin in Virginia than was mined in Pennsylvania. These triassic coals are interesting geologically because they occur in more recent formations than the coals of the carboniferous period.

CONSUMPTION OF IRON IN JAPAN.

Specially Prepared for the Engineering and Mining Journal by T. Wade.

The mining industry in Japan has during the last 10 years made good progress, and the latest improvements have been adopted by all of our big mines so far as technical completeness is concerned, and we need not fear a comparison with any of the other countries. The iron industry is yet in a state of development and the consumption is principally covered by imports. Until about 25 years ago the Japanese were only able to produce iron out of magnetic iron sand by working the sand on open hearth with charcoal and bellows during several days until the iron was reduced to a sponge. According to temperature and blast different grades of iron were the results, viz., raw iron, malleable iron and steel, in many cases mixed, so that often one lump consisted partly of raw iron and partly of raw steel. Magnetic iron sand is produced by carefully washing decayed granite and other eruptive stone. By these means from 20,000 to 25,000 tons were produced yearly, sufficient for the consumption of the country.

The introduction of foreign technical methods in Japan, about 16 years ago, led also to establishing the great iron works at Kamaishi. On account of the inexperience in the technology, scarcity of charcoal, and a general depression, these works had to be shut down after only a few years' run. Their cost was \$3,000,000. These discouraging results have prevented any Japanese firm from undertaking to open a similar establishment, although the difficulties above mentioned do not longer exist. The only exception is Mr. Tanaka, of Tokio, who has been able to buy for \$35,000 not only the whole plant at Kamaishi, but also an extensive ore deposit. About five years ago he built a blast furnace of a duly capacity of five tons raw iron, and enlarged the plant by putting up several other furnaces of from five to ten tons daily capacity. Up to a recent day only charcoal had been used as fuel, but since he has reopened the large and extensive works coke is in use and raw iron only produced at present.

The consumption of iron is steadily increasing. The following table shows the average yearly consumption by the government works:

	Imperial Firearms Factory, 1888-1892.		Imperial Navy Yard, 1890-1891.		Imperial Naval Arms Factory, 1890-1892.	
	Tons.	Total value.	Tons.	Total value.	Tons.	Total value.
Steel.....	688	\$217,379	1,240	\$405,259	82	\$10,610
Malleable iron...	532	\$6,519	612	\$3,057	156	\$19,356
Raw iron.....	2,411	\$6,693	522	\$6,403	291	\$3,317
Total.....	3,631	\$370,591	2,374	\$171,719	530	\$39,342

The largest men-of-war are ordered from England and France; therefore the consumption of iron is little.

At the end of March, 1893, 1,781 English miles of railroad were in operation which cost \$22,310,551 for 313,399 tons of steel for rails, bridges, iron parts of locomotives, cars, etc.

Since the beginning of April, 1893, another 760 miles of railroad have been opened or are in the course of construction, for which 116,833 tons of iron material have been used, valued at \$3,233,899. Rails and bridges have to be removed every 25 years, and besides from 200 to 250 miles of new lines of railroads are constructed every year.

At the end of December, 1892, the steamboats numbered 375, registering 97,569 tons; iron used in the building of these ships, 65,084 tons; average yearly construction of new ships for 1888-1892, 29.4; registered tons 3,028; iron used, 1,414 tons. Average yearly loss for the same period through wreckage, 12.4 ships, registering 3,666 tons. The cause of the

difference in the tonnage of wrecked and new built ships is that that larger crafts are built in foreign countries.

The different machine works use at an average about 32,541 tons of iron per year.

Smaller concerns, machine shops, foundries, etc., use at an average about 25,000 tons of iron per year.

Recapitulation: Tons iron in Firearms Factory for regular army, 3,662; navy yard and naval arms factory, 2,903; rails for railroads, 26,860; steamboats, 1,414; machine works, 32,541; machine shops, foundries, etc., 25,500; total, 92,480 tons.

On account of the absence of sufficient iron and steel works in Japan a considerable quantity of the different grades of iron as raw material, as well as engines, steamboats and all the necessary implements for railroads is imported. The following tables show the details of the import:

Steel and Iron—Ingots, Plates, Angular or "L."									
1888.		1889.		1890.		1891.		1892.	
Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.
52,195	1,764,017	44,551	1,799,774	41,618	1,686,494	46,421	1,730,710	42,528	1,691,580
Rails for Railroads.									
1888.		1889.		1890.		1891.		1892.	
Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.
52,201	1,462,429	21,699	686,871	34,068	1,235,381	21,417	700,638	19,166	67,438
Steel and Iron—Sheet, Hoops (Bands), Wire, Pipes, Nails, Rope.									
1888.		1889.		1890.		1891.		1892.	
Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.
2,936,881		2,700,025		2,564,979		1,682,089		1,981,201	
Furnaces.									
1878.		1889.		1890.		1891.		1892.	
Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.
29,297		15,010		153,194		116,761		517,653	
Various Machinery.									
1888.		1889.		1890.		1891.		1892.	
Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.
1,531,857		1,604,980		2,283,959		2,130,377		3,296,791	
Steamboats, Wagons, Railroad Cars, Locomotives.									
1888.		1889.		1890.		1891.		1892.	
Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.	Tons.	Yen.
1,727,063		1,981,652		2,164,993		1,553,645		735,636	

(One yen equals one dollar.)

A yearly average for the five years in the foregoing table shows: I. Steel and iron (ingots, plates), 1,734,115 yen. II. Rails, 825,331 yen. III. Steel and iron (sheets, etc.), 2,323,086 yen. IV. Firearms, 166,268 yen. V. Machinery, 2,505,402 yen. VI. Steamboats, wagons, etc., 1,629,677 yen. Total, 9,253,824 yen.

The above amount is the original value of the goods at the place from whence they were exported. In Japan the value will be about 40% higher. Freight and sundry expenses for raw iron from 60 to 70%; for malleable iron 20%; for steel 25 to 30%; and machinery, 20 to 50%. That means that Japan pays to foreign countries for iron and manufactured iron about 12,955,354 yen per year.

Japan is wealthy in pure magnetic iron ore, and coal for the manufacture of coke is plenty. It would be a paying feature to establish iron and steel works in Japan. Five years from now the consumption of iron and steel in this country alone will be over 130,000 tons per year, and China and Korea will be ready markets for the Japanese goods.

ON A NEW DEPOSIT OF PHOSPHATES IN THE SOUTH OF FRANCE.*

By Armand Gautier.

In 1882, while engaged in the study of the geological structure of the valley of the Aude, on the north eastern flank of the Pyrenees, the author undertook the investigation of the deposits in a series of caverns continued in the limestone cliffs of the River Cesse. These limestones, which are of Eocene date, form elevated barren tablelands known as "causses," rising to about 1,000 ft above the sea level, and where cut through by the streams, are seen to lie at a low angle upon hard siliceous limestones of Devonian age. The surface of junction is irregular, and the upper strata near the contact are eroded into long ramifying galleries whose roofs and sides are in the nummulitic rock, while the floors, apart from the filling material, are formed by the Devonian rock. The most important of these caves, known as the Grotte de Minerve, situated near the village of the same name, about 17 miles from Narbonne and 22 miles from Carcassonne, is a system of two principal galleries from 25 to 30 ft. wide, and 30 to 33 ft. high, which cross obliquely and extend for about a total length of 3,600 ft. following the dip of the nummulitic strata. The floor is covered with cave earth and bone breccia, containing worked flints, pottery, and other prehistoric antiquities, the bones of the cave bear and other quadrupeds to a depth of 10 to 15 ft., below which concretionary phosphorite, and other forms of phosphates, both of lime and alumina, are found in quantities; the deposits, proved by numerous trial pits varying from 15 to 50 ft. in depth, being estimated to contain from 120,000 to 300,000 tons of phosphatic minerals, which differ in many respects from the ordinary phosphorites of stratified formations. Among these, one of the most interesting is Brushite, a hydraulic dibasic calcium phosphate (2CaO P₂O₅ 5H₂O) which had only been known previously as a secondary product in crusting the rock guano of Aves Island and Sombro in the West Indies. It contains phosphoric acid 43, lime 34, and water 23%, and, as a rule occurs in crusts upon and filling fissures in the limestone rocks, and in the purest form is a bright powdery substance made up of thin crystalline plates exactly similar to those described by the discoverers of the original mineral. The bulk of the deposit is, however, made up of mixtures of tribasic calcic phosphate and neutral phosphate of alumina, which vary within rather wide limits, but frequently are in nearly equal proportions, about 24 to 25% of each, containing about 27% of phosphoric acid, which is mostly all soluble in weak acids. A third, and previously undescibed substance to which the name of Minervite has been given, is a hydrated aluminic phosphate (Al₂O₃ P₂O₅ 7H₂O) which was found as a white plastic mass, filling a vein from 2 to 2 1/2 ft. thick.

* Abstract of article in "Annales des Mines."

THE SOLAROMETER.

The use of iron in shipbuilding has introduced an element of compass error in navigation which cannot be corrected by calculation, and which, at times, may lead to serious results. Since the discovery of the compass there has been no improvements made in this direction other than in the mechanical construction of the instrument, the only reliable calculations of position being those ascertained by the sextant, and when the sun is obscured these observations cannot be taken.

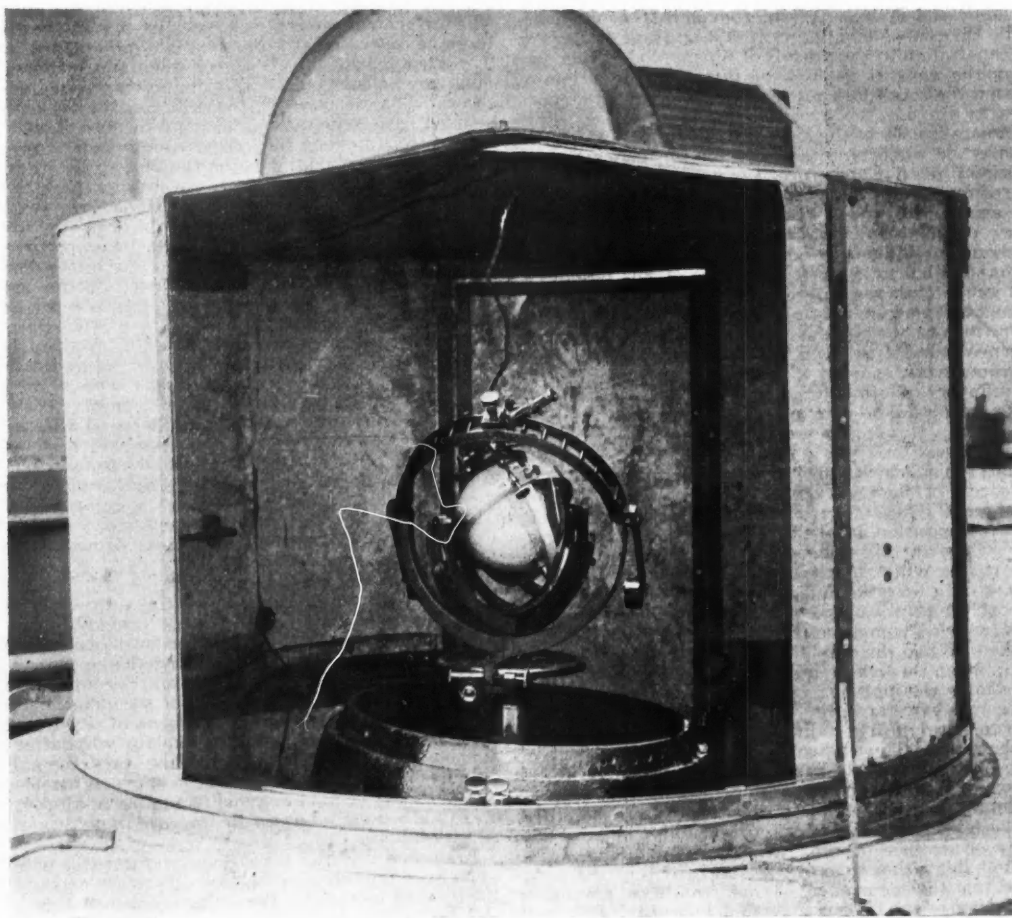
In order to avoid these difficulties, Lieutenant W. H. Beehler, of the United States Navy, has constructed the instrument shown in the accompanying illustration, which he calls a solarometer. With this, problems of nautical astronomy are solved mechanically, and by comparing the results of any observation with corresponding computed values of declination, latitude, hour, angle and azimuth in books prepared by him, the observer has positive proof of the accuracy of his observation.

Clouds will of course render heavenly bodies invisible to this instrument as well as others, but it rarely happens that neither the sun nor stars are visible for a few moments in twenty-four hours. With a sextant it is necessary to have the sun visible twice, once for latitude near the meridian and once for time when east or west of the observer. Again, during foggy weather while the sun may be visible the horizon is obscured and the sextant naturally of no service. The solarometer is mounted on a constant level base so the horizon can always be ascertained.

a heavenly body is predicted in the "Nautical Almanac" to be on one arc, while its position for the same time and place is predicted in the book of azimuth tables to be on another arc. As the position of the heavenly body is for the same time and place certain in a position on two different arcs it must be at their intersection. If there is a telescope mounted at the intersection of these two arcs and the heavenly body be seen in the axis of that telescope, then the corresponding circles will by construction show the local time, latitude and true azimuth.

The four graduated arcs of the solarometer show the declination, latitude, hour angle and azimuth. The book of azimuth tables enlarged and extended shows computed relation between these four quantities. If then there is exact correspondence between the four quantities as read from the solarometer and as computed in the book of azimuth tables, the observer has positive proof that his result is accurate.

The method of using the solarometer is as follows in case of the sun, viz.: Find in the "Nautical Almanac" the declination of the sun for the Greenwich date, and time as shown by the chronometer regulated to keep Greenwich mean time and reduced by the equation of time to Greenwich apparent time. The sliding vernier in the declination circle is then adjusted to that declination, the telescope is then turned toward the sun and its image is made to appear in the axis of the telescope by raising or lowering the elevated pole by the ratchet worm or polar bracket. The sun's disc will be found either above or below the axis of the telescope, too near or too far from the pole, but in either case it is a simple matter to



BEEHLER'S SOLAROMETER.

The constant level base consists of a stand about 3½ ft. in diameter and 16 in. high, secured to the deck amidship. This stand supports on gimbals a ring and bowl containing 880 lbs. of mercury. A cast iron float rests in the mercury and carries the instrument so that the motions of the ship are not carried to it. In case of very bad weather when a ship is rolling and pitching violently it may be impracticable to take observations on account of the violence with which the float may be carried about in the mercury.

The instrument consists of a starsphere with meridian circle, equatorial or hour circle, declination circle, polar bracket, azimuth arc and a horizontal circle supported by four independent arcs on the same float. The sphere and all the rings are concentric and made of aluminum alloy. The polar bracket, declination circle and horizontal circle are graduated into degrees, minutes and seconds of arc. The equatorial or hour circle is graduated to hours, minutes and seconds. All the arcs are provided with verniers.

The vernier on the declination circle is a sliding block on ribs, fitted with a socket pin at the initial point of the vernier. The axis of this socket pin is a prolongation of the radius of the declination circle. The socket fits a ball dependent from a sleeve carrying a telescope and mirror in the azimuth arc. The axis of the ball pin and telescope are also in the same line, or a prolonged radius of the concentric circles. The azimuth arc and declination circle are thus united with a movable junction allowing the two circles to make any angle with each other.

The instrument is constructed on the principle that the exact position of

get it exactly in the axis of the telescope, and when so found the reading of the graduated polar bracket is the angular elevation of the pole and is the observer's latitude. The declination and latitude are thus known and the sun's altitude above the horizontal circle is incidentally indicated by construction, since the movement of the declination circle around its axis will carry the telescope in a plane which will meet the horizon at the two points corresponding to sunrise and sunset. If the sun be seen in the exact axis of the telescope, then the angular height of the axis of the telescope on the azimuth circle is the sun's true altitude at that instant of time. This instant is noted by a chronometer and will be the Greenwich instant of the observation. The angular distance of the declination circle from the meridian circle can then be leisurely read, and it will give the sun's hour angle in hours, minutes and seconds of time. This hour angle in case of the sun is local apparent time, and by comparison with the Greenwich time as shown by the chronometer, gives the observer's longitude.

The points where the azimuth circle meet the horizon circle are next read, and this indicates the sun's true azimuth. The reading of the position of the index on the graduated horizon circle in the line of the vessel's keel will be the degrees, minutes and seconds that the ship's keel is from the true north and south line. The difference between this and the ship's course, as shown by the compass, is the total compass error.

Observations are made with the stars and moon in precisely the same manner, except that in order to see the star or the moon in the axis of the telescope the cross hairs are illuminated by a small two-candle-power electric lamp with a current of electricity from a small portable storage

battery. The fine graduated arcs are read by means of small electric lamps in a branch circuit.

The importance of a constant available means of determining the compass error on board of modern steel vessels can be readily seen. Experience shows that no compensation of the compasses for the magnetism of the ship nor any determination of the magnetic effect upon the compass will hold good for any length of time or for great changes of position. The most constant observations are necessary in order that any confidence can be reposed in the compass, and even then its indications must be regarded with suspicion.

The instrument is also applicable to surveying work on shore, obviating the necessity for the elaborate system of triangulation by astronomical determination of points along the coast. Lieutenant Beehler has placed one of the instruments on the steamer *Wiemar*, sailing from Baltimore to Europe, so as to further test its value.

THE LODES OF PONTGIBAUD, FRANCE.

Written for the Engineering and Mining Journal, by T. A. Rickard.

(Concluded from page 125.)

THE AGE AND ORIGIN OF THE LODE FORMATION.

The age of the lode formation of Pontgibaud is considered by M. Lodin to be intermediate between the Miocene and Pliocene periods. This opinion is founded upon the following facts. The metalliferous veins do not penetrate either the Quaternary basalts of Chalusset nor the Upper Pliocene flows of Loudme and Roure. Again, they must be of an age earlier than the Middle Pliocene, since one vein at least (that of Saysoubre) is known not to penetrate into the gravels of this period. There are reasons, founded upon the general geology of this and the adjoining region, for believing that their age does not reach beyond the Miocene.

Neither the changes in dip nor the irregularities in strike appear to have influenced the mineralization of the lodes. M. Lodin points out that while these features may be important factors when the vein fractures occur in a country rock of regular structure they have not the same influence when the line of formation of the lodes has been determined by the occurrence of pre-existing fissures. Though this is, of course, true it suggests the existence of veins in a country of such regularity of structure as to be without any influence upon the behavior of the lodes. It is safe to say, and one has but to refer to the work of Von Groddeck, Emmons, Pearce and other observers in this particular field, that the unravelling of the structural geology of a mining region is the key to the puzzling variations in its ore distribution, and that, no rock formation being entirely homogeneous and free from lines of fracture, no lodes are independent of the structure of the country which they traverse.

In speaking of the influence of ore-existing fissures, M. Lodin refers to the dikes of granu-lite which the ore-bearing veins are found to follow. This feature of the geology is paramount in influencing the lode formation of the Pontgibaud mines.

The gneiss and mica schist which form the prevailing country rock, which are the "bedrock" of the region,* are intersected, as we have seen, by a large number of dikes of various feldspathic igneous rocks whose varying mineral composition labels them granu-lite, microgranu-lite and orthophyre.† They are all evidently of an age anterior to the deposition of the lode matter which now is found associated with them. The veins of ore consist of a barytic and quartzose filling containing blende and galena, occurring in streaks of varying regularity in the midst of the dike rock, which is sometimes brecciated and crushed, sometimes solid and unbroken. When the dike diminishes in size the streak of ore decreases in width; when the lode fracture ceases to be accompanied by dike rock and penetrates the inclosing gneiss or schist, then the vein fills narrow and becomes barren of ore.

It has been possible to distinguish certain differences in the influence of dikes of different character. Thus, a rock containing large crystals of feldspar, a feldspar porphyry, appears to have been unfavorable to the deposition of ore. An example of this occurs south of Pranal and another instance is found at Roure. Notwithstanding this fact, it can be stated that in general the most feldspathic dike rocks appear to be the most distinctly favorable to the occurrence of ore. The exception above noted may be traceable to the habit rather than to the composition of the rock.

It would be expected that the occurrence of ore would be associated with a marked kaolinization of the feldspar. Such is indeed the case, and one would, therefore, be inclined at once to conclude that the alteration of the feldspar must be due to the agencies which also brought about the mineralization of the rock. M. Lodin, however, considers this to be a coincidence and nothing more. He quotes the following illustrations: At La Brousse the main ore body occurs in a feldspathic dike rock, which is very much kaolinized near the surface, where the ore was rich in quality and quantity, but it is equally altered at a depth of 240 m., where the dyke has dwindled in size and the ore entirely pinched out. On the other hand the granu-lite is comparatively little changed at 160 and 180 m., where some fair stoping ground was opened up. At Roure again, the degree of kaolinization seems to be determined by the nearness to the surface. None is observable in the granu-lite of the lower levels of the mine. M. Lodin admits that the change in the condition of the granu-lite corresponds with the impoverishment of the lode, but this he considers to be due to the fact that the chief ore bodies of Roure, like those of the Pontgibaud mines in general, are situated close to the croppings. The feldspar of the granu-lite at Roure is unaltered in the deeper workings, but there is no change to note in this respect between the rock encasing small bunches of ore, and that of the country surrounding barren portions of the lode. At Barbecot and Pranal the vein filling is compact, and the dike rock, unlike that of the other mines, is rarely decomposed. The rich and the poor parts of the lodes are alike in this respect. The inclosing country rock—the gneiss—is similarly much harder and compact in these the northern mines than at La Brousse and Rosier, farther south.

In summarizing the evidence M. Lodin emphasizes two main features,

* One cannot say "basement" rock, because that position is occupied by the granite. M. Lodin says "sous-sol," or sub-soil.
† Granu-lite—nameless granu-lite or pegmatite. Microgranu-lite—a fine grained variety of the same. Orthophyre—same, with more quartz. Quartz porphyry.

that the ore has been deposited along fractures which follow dikes of granu-lite and that the metalliferous contents are most rich when the dike rock is most feldspathic. He lays stress upon the latter observation and states that he considers it to be a fact which applies to regions outside of Pontgibaud, but that in such cases it has not been placed sufficiently in evidence.

With the last remark American mining engineers who have studied ore deposition will politely disagree. It will serve as a text for a brief discussion of the lode structure and ore occurrence of the Pontgibaud mines, as viewed by one who has seen many similar phenomena in other countries. The frequent association of ore deposits and feldspathic igneous rocks has been emphasized again and again. The "porphyry" of the Western miner is to him the almost necessary companion of a good lode. As he uses this term it covers both porphyritic and non-porphyritic varieties of rhyolite, felsite, trachyte, andesite and other rocks of a class among the members of which he knows no difference, though as a type they are in his mind clearly distinguished from granite on the one hand or the sedimentaries on the other.

Many mining districts might be cited, the "Transactions" of the American Institute of Mining Engineers are full of descriptions of them but space will only allow of reference to one region, and for our immediate purpose the most interesting will be that of the granitoid-gneiss country of Clear Creek and Gilpin counties, in Colorado, whose characteristic features have much to remind one of the Pontgibaud district. The country rock, which gradates from soft mica schist to very hard crystalline granite, is penetrated by numerous dikes of "porphyry." This "porphyry" proves, upon microscopic examination, to be a quartz andesite or dacite. The ore occurrence is closely associated with the dike rock and the lodes often consist of what is practically a mineralized and decomposed dike. The main lode of the California mine, for instance, has been found to accompany a dike 15 to 17 ft wide, now upon one side of it, now upon the other. The ore assent to the mill consists of kaolinized andesite, interspersed with numerous streaks and patches of gold bearing pyrite. Outside of the dike rock the lode is usually poor. Across the hills, at Silver Plume, in the adjoining county, much of the ore is found associated with a very coarsely but uniformly porphyritic rock, whose name of "corn rock" indicates its appearance. Upon examination it is found to be a granu-lite or pegmatite whose porphyritically disseminated feldspar is microcline. Throughout this region the occurrence of "porphyry" is considered by the miners to be favorable to the discovery of ore.

At Pontgibaud the interdependence of the ore and the granu-lite is brought out very clearly in the evidence, and the lode structure in general presents many features familiar to men of Western experience. The ore is confined to the granu-lite, and it forsakes the vein when the latter penetrates the surrounding gneiss. At Pranal the inclosing rock is harder, the dikes of granu-lite are smaller, the veins of ore narrower, than at La Brousse and Roure where on the contrary both country rock and dike material are softer, the dikes wider and the ore more generously distributed. Where there are two companion veins—as for instance the Virginia and Saint-Arne at Roure—the country separating them is usually traversed by cross veins, some of which are ore-bearing. The ore shoots do not appear to be affected by the irregularities in the course of the lode. The mica schist and gneiss become more hard in the lower levels, and finally, and from an economic standpoint most important of all, the ore bodies do not persist in depth.

The last fact is especially discussed by M. Lodin. His conclusion is to the effect that in the upper levels the large and rich bodies of ore owe their formation to the concentration brought about by leaching and re-precipitation and that in the lower levels we see the lodes in their normal condition. He takes especial and particular pains to avoid admitting that the lodes become poorer in depth; on the contrary he would put it that they get richer near the surface owing to secondary deposition. This is splitting hairs. The surface enrichment of silver lead lodes is a fact well recognized, but this does not explain why, after the region of surface agencies is left behind, the unoxidized ores, the galena should become not only less in quantity, but poorer in silver as further depth is gained. It is too much the fashion to avoid facing the unkind, even brutal fact, that the ore of lodes does not as a rule improve in quality or quantity as additional depth is obtained.

To discuss this important question further it will be necessary to make some brief reference to the probable origin and mode of formation of the Pontgibaud lodes. In discussing problems of this kind it is very necessary to distinguish between the fracture or fissure along which ore deposition has taken place and the ore which has been deposited in it. In this case the lines of future mineralization were brought into existence some time in the middle Tertiary, and therefore, geologically speaking, comparatively lately. Their origin was due to the fact that it was easier for the country rock to undergo fracture along the course of the dikes of granu-lite than across the surrounding harder crystalline schists. Lines of weakness thus established became lines of maximum circulation for underground waters. Nevertheless the ore deposition must not be considered as having necessarily been brought about simultaneously with the formation of the lode fractures; it began immediately after, but it has been going on to a varying degree ever since. It is going on to-day. It is probable that at the different epochs, late in the Tertiary and during the Quaternary, when this region was the theatre of volcanic activity, the lines of original weakness, now occupied by dikes of granu-lite which were becoming in places mineralized by the action of percolating waters, were more than once lines of fresh fracture and so afforded increasing facilities for the circulation of mineralizing waters. Near surface, not necessarily the surface of to-day, but the surface of any given time, the conditions were most favorable to ore deposition, because of lessened temperature and diminished pressure. The less impenetrability and the less resistance to forces tending to produce fracturing exhibited by rocks near surface, because of the lightning of the pressure under which at greater depths they are subjected, is an important factor in ore deposition. Facts do not, it is true, warrant the supposition that open fissures can extend to any considerable depth. The pressure of enormous rock masses makes it impossible to conceive of the occurrence of open spaces at great depths, but near surface such phenomena can and do occasionally occur. In this connection it will be opportune to mention certain fault fissures which cross the Virginia lode at Roure. One of these dislocations, a little to the south of the Ste. Marie shaft, is remark-

able because for a distance of 10 meters both the vein and its encasing rock are crushed and their fragments are mixed with boulders which appear to have been derived from the surface. This is at a depth of 50 meters. At a distance of about 45 meters farther south a second fault disturbs the lode, and it is accompanied by a mass of clayey material containing pebbles, black, soft and porous, very much resembling rounded pieces of scoriaceous lava. Nothing of the kind was found in the lower levels of the mine. The boulders found under the circumstances just described must have originally been a part of the aluvium which covered the outcrop of the lode, and they must have fallen into the vein at the time of the formation of an open fissure. It is not difficult to suppose such an unusual phenomenon to have occurred, seeing that the district has been frequently subjected to the earthquakes which often accompany or precede volcanic activity. The finding of these boulders forcibly illustrates the fact that the conditions obtaining near the surface are very unlike those that exist at a great depth.

In the light of this evidence it is to be wondered at if the granulite dikes widen in approaching the surface and, since they (the dikes) are the lines of mineralization, that the ore bodies are also near the surface both larger and more generous in their silver contents.

In depth the country rock becomes harder, the fractures in them become tighter, the granulite dikes become smaller and the ore veins thin out.

This brief discussion of the origin of the Pontgibaud lodes would be incomplete without drawing attention to the fact that it must be closely related to the volcanic activity of Auvergne. The mines are in a region

BETHLEHEM'S 18-IN. HARVEYED NICKEL-STEEL ARMOR PLATE.

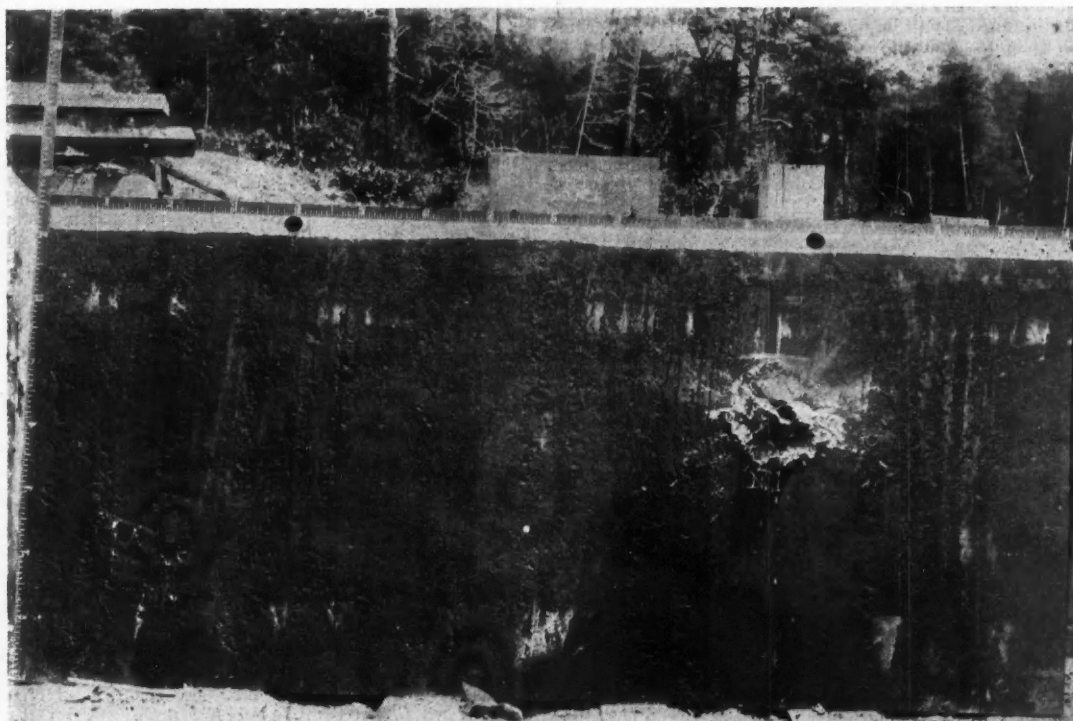
Through the courtesy of the Bureau of Ordnance of the Navy Department we are enabled to present herewith illustrations of the 18 in. Harveyed nickel-steel armor plate made by the Bethlehem works, and tested at the Indian Head proving grounds on July 20th, and fully reported in our issue of July 28th. The illustrations show the effect of both the first and second shots upon the plate.

THE USE OF ALUMINUM SULPHIDE FOR PRODUCING SULPHURETED HYDROGEN.

Written for the Engineering and Mining Journal by its London Representative.

It has long been known that sulphide of aluminum is decomposed by water into oxide of aluminum and sulphureted hydrogen, but it is only recently that this compound has been suggested as a source of supply of sulphureted hydrogen for practical purposes. The difficulty of preparing the sulphide has stood in the way of adapting it for this purpose. The researches of Mr. Claude Vautin, however, have provided a method of manufacture which has proved so successful that a firm of chemists in London is now making the chemical and supplying it in pound tins for laboratory use.

The sulphide is prepared by mixing galena with metallic aluminum in



THE 18-IN. ARMOR PLATE FOR THE "INDIANA" AFTER THE FIRST SHOT.

of extinct volcanoes, but of very active, numerous and powerful mineral springs. Nearly all the lodes of Pranal give out emanations of carbonic acid gas in such quantity as to be a serious hindrance to mining operations. Artificial ventilation is required. The origin of such emanations is suggested by the vicinity of the volcanic crater of Chaluset; indeed, one of the veins encountered a fissure or vent filled with volcanic cinders and yielding so much water as to put a stop to further exploration in that direction.

The lodes of this classic region therefore confirm in a most interesting way the experience of the new mining fields of America and Australasia that ore occurrence is often closely associated with young eruptive rocks and dying volcanic agencies.

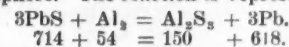
Pig Iron Production in Germany.—The output of pig iron by the German furnaces for the six months ending June 30th was 2,649,071 tons, an increase of 247,131 tons, or 10.3%, as compared with the first half of 1893.

Investigating the Railroad Strike.—Notice is given that the Commission appointed by the President to investigate the recent strikes—consisting of Commissioner of Labor Carroll D. Wright, Messrs. John D. Kernan and Nicholas E. Worthington—has adopted the following order: "That this commission will meet at the United States Post Office Building in the city of Chicago, Ill., August 15th, 1894, at 10 A. M., for the purpose of taking testimony in relation to said controversies, and to hear and consider all facts, suggestions and arguments as to the causes thereof, the conditions accompanying and the best means of adjusting the same, and as to any legislation or measures which ought to be recommended in regard to similar controversies hereafter.

"That all railroads, labor organizations and citizens having either a personal or patriotic interest in the right solution of these questions, and who cannot conveniently attend such public hearing as aforesaid, are requested to present their views and suggestions in writing to the commission at any time prior to the date of such public hearing.

"That all communications be addressed to the Chairman of the United States Strike Commission, Washington, D. C."

crucibles and heating the mixture to a red heat in a reverberatory furnace with a neutral atmosphere. The reaction is represented by the equation:



In practice it is found advisable to use an excess of aluminum in order to help the lead to take up the impurities in the galena. When the reaction is completed the sulphide of aluminum is found at the top in a distinct layer, while the lead and impurities are at the bottom. It is advisable to use galena as free as possible from silver, because it is not possible to refine the lead residue owing to the presence of aluminum in it. At the present time nothing is done with the lead residues.

The amounts of galena and aluminum used in preparing the sulphide of aluminum, and the lead remainder, are all made clear from the molecular weights placed underneath the equation of reaction. It will be seen that a pound of aluminum produces nearly three pounds of sulphide; in practice, when an excess of aluminum is used, the pound produces about 2½ lbs. of the sulphide, or rather less. With aluminum at say 2s. 6d., or 60 cents per pound, a very fair margin of profit is left by selling the sulphide at 2s. 6d., or 60 cents per pound can.

When the sulphide is used for preparing sulphureted hydrogen the reaction is as follows:



Calculating out the atomic weights it will be seen that 150 parts by weight of sulphide give 102 parts by weight of sulphureted hydrogen, so that the pound of Al_2S_3 gives nearly 11 oz. of H_2S , or, to produce one pound of H_2S it requires 1.47 lbs. of Al_2S_3 . The usual way of preparing sulphureted hydrogen is to heat sulphide of iron (FeS) with sulphuric acid, according to the equation:



That is, 88 parts by weight of sulphide of iron and 98 parts by weight of sulphuric acid are required to produce 34 parts by weight of sulphureted hydrogen; or to produce 1 lb. of H_2S it requires 2.59 lbs. of FeS and 2.9 lbs. of H_2SO_4 , as compared with 1.47 lbs. of Al_2S_3 with no acid. The aluminum sulphide methods is therefore, for laboratory purposes, just as cheap and much more convenient.

TO DEFINE THE UNITS OF ELECTRICAL MEASURE.

The following is an act before Congress to define the legal unit of electrical measure in the United States:

First. The unit of resistance shall be what is known as the international Ohm, which is substantially equal to one thousand million units of resistance of the centimeter gram-second system of electro-magnetic units, and is represented by the resistance offered to an unvarying electric current by a column of mercury at the temperature of melting ice fourteen and four thousand five hundred and twenty-one ten-thousandths grams in mass, of a constant cross-sectional area, and of the length of one hundred and six and three-tenths centimeters.

Second. The unit of current shall be what is known as the international Ampere, which is one-tenth of the unit of current of the centimeter gram-second system of electro-magnetic units, and is the practical equivalent of the unvarying current, which, when passed through a solution of nitrate of silver in water in accordance with standard specifications, deposits silver at the rate of one thousand one hundred and eighteen millionths of a gram per second.

Third. The unit of electromotive force shall be what is known as the international Volt, which is the electromotive force that, steadily applied to a conductor whose resistance is one international Ohm, will produce a current of an international Ampere, and is practically equivalent to one thousand fourteen hundred and thirty-fourths of the electromotive force between the poles or electrodes of the voltaic cell, known as Clark's cell, at a temperature of 15 deg. centigrade, and prepared in the manner described in the standard specifications.

Fourth. The unit of quantity shall be what is known as the international Coulomb, which is the quantity of electricity transferred by a current of one international Ampere in one second.

Fifth. The unit of capacity shall be what is known as the international Farad, which is the capacity of a condenser charged to a potential of one international Volt by one international Coulomb of electricity.

Sixth. The unit of work shall be the Joule, which is equal to 10,000,000 units of work in the centimeter gram second system, and which is practically equivalent to the energy expended in one second by an international Ampere in an international Ohm.

Seventh. The unit of power shall be the Watt, which is equal to 10,000,000 units of power in the centimeter gram-second system, and which is practically equivalent to the work done at the rate of one Joule per second.

Eighth. The unit of induction shall be the Henry, which is the induction in a circuit when the electromotive force induced in this circuit is one international Volt, while the inducing current varies at the rate of one Ampere per second.

It shall be the duty of the National Academy of Sciences to prescribe and publish, as soon as possible after the passage of this act, such specifications of details as shall be necessary for the practical application of the definitions of the Ampere and Volt, and these shall be the standard specifications.

ABSTRACTS OF OFFICIAL REPORTS.

Wolverine Copper Mining Company, Michigan.

The report for the year ending June 30th, 1894, says that the product of the mine was 1,852,235 lbs. of mineral, which yielded about 87.02% or 1,611,857 lbs. of refined copper. The following is a summary of the year's business: 1,611,857 lbs. copper sold for \$158,508; the working expenses at mine were \$123,871; smelting, freight, cost of marketing and all expenses, \$30,670; total, \$144,551, leaving as mining profit \$13,957. Interest on loans was \$513, making the net gain \$13,444.

The production has been about what was expected, and has been made at a low average cost per pound, but the continuous decline in the market value of copper to the present low price of 9c. per lb. makes the business of the year quite unsatisfactory, although a small profit was realized over all expenditures.

The assets on June 30th were: Cash, \$13,278; copper bills, \$24,197; due on assessment, \$801; cash, fuel, supplies and accounts receivable at mine, \$7,655; total, \$45,931. The liabilities were: Agent's drafts, \$8,295; indebtedness at mine, \$7,935; accounts payable, \$6,437; total, \$22,717, leaving a balance of assets, amounting to \$23,214.

The average selling price of copper was 9.83c. per lb. The cost of metal was made up as follows: Underground expenses, 5.12c.; rock-house, 0.51c.; stamp mill, 1.69c.; surface, office, etc., 0.36c.; total cost at mine, 7.68c.; smelting, freight and marketing, including New York office, 1.28c.; total, 8.96c. per lb., leaving 0.87c. per lb. as profit.

A summary of the general results is as follows: Rock hoisted, 108,220 tons; rock stamped, 76,440; product of mineral, 1,852,235 lbs.; product of refined copper, 1,611,857 lbs.; the yield of rock treated was 21.08 lbs., or 1.05%; the cost per ton of rock hoisted was \$1.145; the cost per ton of rock stamped, \$1.625.

The underground work included 279.2 ft. sinking at a cost of \$11.18 per ft.; drifting, 2,304.6 ft. at \$5.97 per foot; stoping, 4,587.7 fathoms at \$8.89 per fathom.

The agent's report says that No. 2 shaft is down 70 ft. below the 10th level; but the lode is poor; in some of the levels good ground was developed. On the west lode in the 6th level good copper has been found. No. 3 shaft has been sunk 209 ft. from the 7th to the 9th level, finding but little copper. Five levels have been opened from this shaft, all showing good copper ground.

The agent says: "The opening work foots up as follows: Sinking shafts, 279.2 ft.; drifting, 2,356 ft.; cross-cutting, 69 ft.; total, 2,583.8 ft.; stoping, 4,587.7 fathoms. The quantity of rock hoisted from the mine was 108,220 tons; discarded as poor, 31,780 tons, or 29%, and stamped 76,440 tons, which gave us 1,852,235 lbs. of mineral, and, at 87.02%, afforded 1,611,857 lbs. of refined copper, or 14.9 lbs. per ton hoisted, and 21.08 lbs. per ton stamped.

"The past year's operations have been quite regular throughout, no serious delays or accidents having occurred to mine plant. The force employed have also been free from fatal accidents."

THE HEATING POWER OF SMOKE.*

By E. R. Tatlock.

It appears to be generally understood that a large percentage of fuel is lost in the smoke which issues so abundantly from most chimneys, and random statements have been made to the effect that the loss in heating-power due to this passing away of combustible matters in smoky furnace gases may reach as high as 30% of the whole. A little consideration, however, will show that the loss of any large percentage of combustible matter, and consequently of heating-power, is quite out of the question. This may be proved in two ways—(1) by calculation of the two sources of heating-power as shown by an analysis of coal or dross used for steam-raising; and (2) by actual analysis of the furnace gases for combustible solids and gases.

In the following paper are given the results of these two methods of observation, the same dross being analyzed and also employed as fuel in a works furnace, from which smoky gases were given off which were tested for combustible matters.

1. The following is the analysis of the dross employed:

	Per cent.
Gas, tar, etc.....	37.63
Fixed carbon.....	49.97
Sulphur.....	0.40
Ash.....	2.72
Water.....	9.28
	100.00
Heating power (practical) due to gas, tar, etc.....	1.16
fixed carbon.....	6.49
	7.65

The points to be observed are the relative proportions of heating power (represented in the analysis by the number of pounds of water at 212° F. capable of being evaporated to dryness by 1 lb. of the fuel) given out respectively by the combustion of gas, tar, etc., and by the fixed carbon. These are calculated according to Playfair's well-known formula, which was practically tested on coals intended for the British Navy, and which shows that while 1 lb. of fixed carbon is capable when burned of evaporating 13 lbs. of water at 212° F. to dryness, 1 lb. of the gas, tar, etc., will only evaporate 3.1 lbs. From these figures it appears that in the coal or dross the gas, tar, etc., only contribute 15% of the total heat given out during the combustion, and that the fixed carbon produces the remainder, or 85%. In coals with less of the former ingredients and more of the latter, which is commonly the case, the proportion given out by the volatile constituents would be considerably reduced. It is thus perfectly clear that even though the whole of the volatile matters (which can alone be accountable for any loss of combustible material) escaped combustion, there could not possibly be a greater loss of heat than 15% of the whole, even in such an extreme case as this represents.

2. An analysis was made of the furnace gases given off during the burning of the dross, of which the results are given above, with the following results:

	Gases very smoky. Per cent. by volume.	Gases almost free from smoke. Per cent. by volume.
Carbonic acid.....	5.0	3.5
oxide.....	none	none
Hydrocarbons.....	trace	none
Nitrogen.....	79.9	79.9
Oxygen.....	15.1	16.6
	100.00	100.00

It has been asserted that carbonic oxide is given off in considerable quantity when much smoke is being produced, but it does not appear in this case; and Hempel, in his work on "Gas Analysis," comes to the conclusion that little or no combustible gases are present in furnace gases. He says: "Furnace gases usually contain only carbon dioxide, oxygen and nitrogen. All other gases are present in but very small amounts. In oft-repeated analyses the author has always found only traces of carbon monoxide, methane and the heavy hydrocarbons." This is in complete accord with the analyses given above, and it may be taken for granted that the presence of carbonic oxide or other combustible gases in furnace gases is a most unusual occurrence. This is quite conclusive evidence that no appreciable loss of heat, even when the furnace gases are smoky, can be attributed to the passing away of the products of imperfect combustion in the gaseous form at least.

That there is loss of combustible matter in the smoke is an undoubted fact, but the quantity seems also to be greatly magnified in certain random statements. In the experiment referred to above, the soot was also collected during one hour and a half with the following results:

	Grains per 100 cu. ft. of furnace gases.
Carbonaceous matter.....	30.81
Ash or mineral matter.....	20.65
Total soot.....	51.46

It will be observed that the soot collected consisted largely of mineral or incombustible matter. In several experiments to estimate the soot in furnace gases similar results to those were obtained, and the average would come very close to the quoted results of this special test.

To find how much carbonaceous matter was actually lost as smoke, it will be necessary to know the number of cubic feet of furnace gases given off by the combustion of, say, one ton of the dross. If the percentage of carbonic acid in the furnace gases is taken at 5%, the total volume of these given off from one ton of dross would be about 940,000 cu. ft. measured at the ordinary temperature and pressure, and this would contain 41 lbs. of carbonaceous matter and 27 lbs. of mineral matter. This would represent 1.8% of the volatile matters (gas, tar, etc.) given in the analysis of the dross; and if from this is now calculated the heating power according to Playfair's formula, it will only come to 0.057. This figure, compared with the practical heating power (7.65) of the dross, goes to show that the solid combustible matter of the smoke can only account for the very small

* The Chemical News.

percentage of 0.74 of the total heating power which can be obtained from the coal.

From the results of these experiments it is evident that the loss of combustible matters in smoke is very small indeed, and that the belief in immense loss by this cause is simply a fallacy, and it is decidedly not corroborated by experiment. In adopting methods of removing the smoke nuisance, it must therefore be borne in mind that there is little or no gain in burning smoke, and that other methods of dealing with the problem, such as Dulier's smoke absorption process, ought also to receive consideration.

ELECTROLYSIS OF ALKALINE CHLORIDES.

The electromotive force requisite for the decomposition of sodium chloride in aqueous solutions has recently been calculated by Nourisson as follows:

Heat absorbed:		Calories.
NaCl = Na + Cl.....	.....	964
H ₂ O = H ₂ + O.....	.....	684
		1,648
Heat evolved:		Calories.
Na + O + H + H ₂ O.....	.....	1,118
Formation of compounds of chlorine and oxygen, say.....	.....	60
		1,178
Net heat absorption.....		470

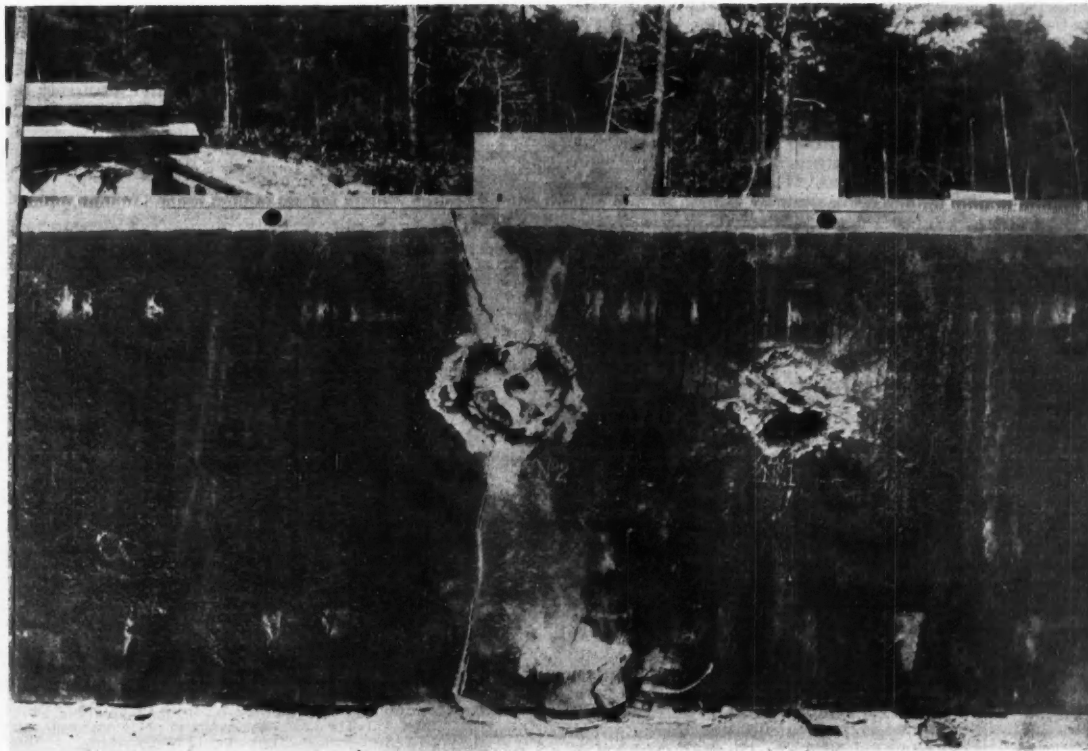
470 calories represent $\frac{470}{232} = 2.02$ volts.

These figures, however, according to F. Oettel, in a recent issue of the "Chemiker Zeitung," are open to correction.

THE CONGO RAILROAD.

This pioneer railroad of Central Africa is of special interest at present when the Congo State has so suddenly become the absorbing topic of European politicians. On the other hand, the commercial importance of the line in the future cannot be overestimated. However, up to the present, in spite of some five years of work, only the first section of the line—Matadi to Kengé—has been finished, owing to climate obstacles and the great engineering difficulties which have had to be overcome, says the "Mouvement Geographique." Money, too, has not been over-plentiful.

On leaving Matadi, in the Congo Basin, and destined to become the greatest emporium on the West African coast, the train, running past the Belgian and Portuguese factories, issues by the Pass of the Pintades on the Leopold ravine spanned by a bridge 20 m. in length, and presently the bank of the Congo is reached, where a fine panorama comes into view. For some 6 kilos. the line is flanked by thick forests, a height of 60 m. being attained. The scenery up to the conflux of the Congo and the M'pozo is described as very grand, the great river forming several splendid falls. The engineering difficulties as far as the bridge over the M'pozo have been very great, the track having been cut through rock of the hardest nature, and laid through ravines entangled with primeval creepers and forest vegetation. The bridge across the M'pozo is of iron, 60 m. in length, and was constructed by the late M. Glaseneer. The line then runs on the right bank of the river. Presently, at a distance from Matadi of 10 kilos, the magnificent Palaballa mountain comes into view, the elevation being now 95 m. Here the locomotive is replenished with water. The track next runs through massive forests up to the village and mission station of Palaballa, situated at a height of 280 m., crossing the forbidding-looking Ravine du Diable. The line runs on the left of the ravine, crossing by turns five bridges of 40, 25, 20, and 10 m. in length, thrown over ravines variously named. The track still rises some 100 to 150 m.



THE 18-IN. ARMOR-PLATE FOR THE "INDIANA" AFTER THE SECOND SHOT.

The heat disturbance which takes place in decomposing, electrically, solutions of sodium chloride is a secondary result, and is due to the formation of hypochlorous and chloric acids. It does not affect the primary electrolysis, and is, moreover, of negative sign. In any case, Oettel considers that it should not be brought into account. The following figures, according to his view of the matter, more nearly represent the electromotive force requisite for the primary decomposition of the sodium chloride:

	Gram-calories.
-(Na, Cl, H ₂ O).....	96,510
-(H ₂ , O).....	68,360
+(Na, O, H, H ₂ O).....	111,810
Sum.....	53,060
53,060 gram-calories represent $\frac{53,060}{23,067} = 2.30$ volts.	

Values of 2.25 and 2.28 volts were obtained by Oettel as the actual potential difference subsisting between gas carbon electrodes while electrolyzing common salt solution with a porous earthenware diaphragm, using currents varying between 3 and 60 amperes. Practically the same values were found with potassium chloride solutions. The electromotive force requisite to electrolyze caustic soda solution was found to be only 1.5 volts.

above the Ravine du Diable until Palaballa Station is entered. This is the grandest and most interesting portion of the journey. Hence to Kenge four rivers are crossed, spanned by handsome iron bridges respectively 20, 30, 70, and 60 m. in length, but there are no engineering difficulties at all resembling those encountered between the Congo and the M'pozo. The country is more level and open, palm and banana groves being also passed. The track now descends a little, crosses the river Kimueza, thereupon the train presently runs into the Kenge Station, at an elevation of 260 m., and 40 kilos. distant from Matadi. The run occupies 1½ hours, the average speed having been 17 kilos., or 10.5 miles, an hour. At Matadi, a long station of corrugated iron has been constructed, and workshops, depots, etc., with a huge hotel, also of iron. On the section of 40 kilos. described there are in all some 200 culverts, cuttings, etc., and 26 bridges, varying in length from 5 to 70 m. The railroad is now being actively continued inland, and with more dispatch, the engineering difficulties being lessened. The company has just taken up a loan of \$1,200,000 wherewith to continue the work. From the last report issued by the company it appears that the total expenditure has been 18,360,272f. (\$3,672,000, or nearly \$100,000 per mile), divided as follows: Cost of constitution, 2,049,290f.; registration, 390,919f.; fixtures, etc., 1,255,242f.; steamers and armaments, 208,289f.; rolling stock, 792,263f.; interest on capital, etc., 2,228,135f.; service of construction, 11,436,132f. The amount at disposal is about 5,000,000f. The track has now been completed for a distance of about 60 kilos., and the earthwork effected for about another 10 kilos. The total estimated length of the entire line is about 150 kilos.

Belgian Briquettes.—The Red Star steamship line, of Antwerp, has concluded a contract with the Charleroi United Collieries Company for 12,000 tons of coal briquettes for use on its vessels.

CORNISH TIN MINING IN PHOTOGRAPH.

WITH SUPPLEMENT.

In our supplement this week we present further illustrations of underground workings in the tin mines of Cornwall.

Fig. 4 illustrates the work of underhand stoping at the 170 level in East Pool mine, showing one man using the pick and others boring holes for blasting.

Fig. 5 shows the man engine at the 234 fathom level in Dolcoath mine. This is an exceedingly interesting photograph, showing clearly the arrangements of "sollers," or platforms, and the slope of the lode. An iron roll fixed behind the rod near the bottom shows the method of supporting and guiding the rods. These rods are made of wood joined by strapping plates and iron bolts. The man engine usually makes about five strokes per minute, enabling the miner to ride about 60 ft. in this time. By double rods this speed could be doubled, but only the single rod is in use at present, and these are being rapidly superseded by gigs and cages.

Fig. 4 shows the gig at Dolcoath, taken on the skip road at the 302-fathom level in the Eastern shaft. This is what is known as a single-deck gig, capable of carrying six men. In a few mines gigs carrying 10 or 16 men are in operation, but in the majority of cases they are of limited capacity, as the shafts are old and small.

Fig. 20 shows a mill or pass in the 412-fathom level of Dolcoath mine, where broken stuff from the stopes and levels above run down into wagons and are conveyed to the shaft. The car, it will be noted, is a plain iron box, with square axles and double-flange wheels.

Artificial Diamonds.—M. Henri Moissan, whose experiments in making artificial diamonds we have before referred to, has recently renewed his experiments. It will be remembered that his plan was to dissolve carbon at a very high temperature in molten iron or silver and to cool the mixture quickly. As iron and silver have the property, like water, of expanding in passing from the liquid to the solid state, the carbon then separates from the fluid mass and is submitted to a great pressure. M. Moissan has tried various methods of cooling and under various conditions. He has obtained a variety of carbon black or transparent, which in certain lights shows a crystalline appearance. It will mark ruby, resists attack by a mixture of chlorate of potassium and nitric acid. Its density is 3 to 3.5, and it burns in oxygen at a temperature of 900 deg. Cent., giving about four times its weight in carbonic acid. These are the properties of the natural diamond.

Progress in Working Aluminium.—At the Industrial Exposition at Lyons, France, M. Charpentier-Page, whose works are at Valdoie, exhibits, according to "L'Echo des Mines," some remarkable specimens of aluminium. These include a number of plates of the following dimensions and weights: One 4.40 m. long, 1 m. wide, 2.5 mm. thick, weight 35 kilos.; one plate 2.60 m. long, 1.05 m. wide, 6 mm. thick, weight 45 kilos.; one plate 4.05 m. long, 0.87 m. wide, 1.5 mm. thick, weight 17 kilos.; one plate 1.50 m. long, 1.05 m. wide, 8 mm. thick, weight 35 kilos. The metal from which these plates were rolled has, according to official tests, a tensile strength of 25 kilos. per square mm., with an elongation of from 4 to 5%. The exhibit also includes angles, channel-bars and other shapes, rolled from aluminium, and a number of square and round bars. Among the latter is one bar 4.25 m. long, 37 mm. in diameter, and weighing 12.30 kilos. These works have heretofore turned out a number of plates for boats and similar work.

Petroleum Briquettes.—The following is given as the formula of M. Maestracci, of the French Navy, for obtaining briquettes of petroleum similar to those of coal: With a liter of petroleum there is mixed 150 grams of triturated soap, 10% of resin, and 333 grams of caustic soda. This mixture is heated, care being taken to stir it. When solidification commences, which takes place at the end of about 40 minutes, observation is made as to the progress of the operation. If the mixture shows a tendency to overflow, some drops of soda are placed in the receptacle. The stirring is continued until solidification is complete. The operation being finished, the material is poured out into molds so as to make the briquettes, which are then placed from 10 to 15 minutes in a stove. All that remains is to let them cool. These briquettes can be used a few hours after manufacture. To these three elements constituting the mixture, M. Maestracci recommends further the addition of 20% of wood shavings and 20% of clay or sand, which makes them firmer and more lasting. Some trials in heating have recently been made at Marseilles on several tugboats with these briquettes. An equal weight supplied three times the heat of ordinary coal briquettes and there is no waste. It is hoped with very simple modifications in the fireplaces to arrive at still better results; the suppression of smoke and an increased production of heat, so that one kilo. of solidified petroleum will be equivalent to four kilos. of coal.

The Siberian Railroad.—Consul-General Jonas, at St. Petersburg, Russia, reports to the State Department that, at the last meeting of the Siberian Railroad Commission with the economic section of the Imperial Council, which took place on May 15th, the Minister of Finance submitted an important memorial in reference to the Great Siberian Railway. According to the imperial decree of December 22d, 1892, the west and central Siberian sections of the line, as far as the city of Irkutsk, as well as the Oussouri section from Vladivostock to Grafskaya, and the connecting line between the Oural and Siberian railways, were to be completed in the year 1901. Last fall it became evident that the road can be built as far as Irkutsk by the year 1898—that is, two years before the time originally indicated—and that the Oussouri line can be finished in 1896. The construction of the line from Grafskaya to Khabarovka has already been approved.

In view of these facts, it was resolved to accelerate the construction of the remaining portions of the Great Siberian Railway in the following manner: First, the building of the Trans-Baikal line is to be pushed, so that it may be opened for traffic in the year 1898, at the time of the completion of the central Siberian section to Irkutsk, and of the connecting link from Irkutsk to Listvenichnaya, on Lake Baikal; second, the whole

line along the Amour River is to be finished before the end of the year 1901. The Minister of Communication has been granted the necessary credit, amounting to 1,215,000 rubles, to carry on the preliminary work of tracing the line from Irkutsk around Lake Baikal, as well as in the Trans-Baikal region, and along the Amour River, and has also been authorized to forward, without delay, part of the material ordered for the other sections of the line. The above resolutions received the sanction of the Emperor on May 25th and the preliminary work in the Trans-Baikal region has already begun.

Test of New Zealand Pig Iron.—Some samples of pig iron made at the Onehunga Iron Works, from Taranaki titanite sand, were recently tested in London by B. Martel and J. T. Milton, of Lloyd's. The samples were sent by Mr. De Costa, from the New Zealand Court, Imperial Institute. The report stated that the piece was about 10 in. long and 1 in. square, and was tested as follows: Placed on supports of 9 in. apart, with the planed side in compression, it broke with a load of 28 cwt. suspended at the center. The two broken pieces were prepared for tensile tests by being turned down to 0.627 in. diameter for a parallel length of 2 in. One piece broke with a load of 3.1 tons, the other with a load of 2.65 tons, giving a strength of 10 tons and 8.55 tons per square inch respectively. These results show the strength to be about equal to the average of cast iron. The broken pieces were afterward submitted to analysis by two independent technical chemists, who report the composition to be as follows:

	No. 1.	No. 2.
Silicon	2.700	2.770
Phosphorus	.780	1.490
Sulphur	.065	.062
Manganese	.9.0	.922
Carbon (graphite)	.....	2.910
Carbon (combined)	.....	.180

The amount of phosphorus is so large as to render the iron altogether unsuitable for the manufacture of steel by either the acid Bessemer or the acid Siemens process, while it is not sufficient to enable it to be treated by the Thomas-Gilchrist process without first heating in a regenerative furnace. For steelmaking with the pig, the only process which could be applied is the open-hearth basic, which would probably have to be combined with the Saniter process for the elimination of the sulphur. The large amount of silicon, however, would probably be destructive of the basic lining of the furnace, rendering frequent repairs and consequent expense necessary.

PATENTS RELATING TO MINING AND METALLURGY.

United States.

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

TUESDAY, AUGUST 7TH, 1894.

- 523,982. Coal Stoker. William H. Hannan, Syracuse, N. Y., Assignor to Harrie E. Hannan, same place. Combination of vertical and tilting plates in boiler front.
- 523,936; 523,987. Process of Electric Metal Working. Hermann Lemp, Lynn, and Walter S. Moody, Chelsea, Mass., Assignors to the Thomson Electric Welding Company of Maine. Combination of plates, holders, transformers and means for supplying current.
- 524,029. Steam Boiler Furnace. Orland D. Orvis, Chicago, Ill. Combination of arch and side discharge.
- 524,044. Electric Pump. Frank W. Merritt and Arthur R. Roe, Duluth, Minn., Assignor to the Electric Motor Company, same place. Pump cylinder with piston-rod attached directly to the armature.
- 524,048. Mining Machine. Henry B. Dierdorff, Columbus, Ohio, Assignor to the Lechner Manufacturing Company, same place. Combination of rack, pinion and worm gear with the stationary and sliding frames.
- 524,061. Mining Machine. Benj. A. Legg, Columbus, Ohio, Assignor to the Lechner Manufacturing Company, same place. Combination of gearing for regulating feed and stroke of cutter bar.
- 524,069. Roller Pulverizing Mill. Edward H. Hurry, New York, N. Y., Assignor to the Standard Portland Cement Company, same place. Combination of casing, discharge and air circulation with the rollers and their mechanism.
- 524,091. Stone Grinding or Polishing Machine. John Lavers, Quincy, Mass. Rotary grinder, combined with reciprocating frame.
- 524,128. Steam Boiler Furnace. George E. Belmont, San Francisco, Cal. Gas pre-heating chamber placed within the boiler.
- 524,130. Manufacture of Asphalt, etc., from Petroleum. Francis X. Byerley, Cleveland, O. The process consists in prolonged exposure of petroleum refuse to a pitch-forming, non-coking temperature.
- 524,149. Tunneling Machine. Reginald Stanley, Nuneaton, England. Combination of bed and rotary cutters with mechanism for operating them.
- 524,221. Phenylrosindulin Sulpho-Acid. Conrad Schraube and Eugen Rtmig, Ludwigshafen, Germany, Assignors to the Badische Anilin und Soda Fabrik, same place. New monosulpho-acid of phenyl-rosindulin.
- 524,233. Cement Mill. John A. Albertson, Lansford, and James H. Fisher, Segfried's Bridge, Pa. Combination of rotating shell, screens and radial pockets.
- 524,244. Machinery for Operating Oil Wells. William F. Burr, Eldred, Pa. Combination with walking-beam, crank-shaft and pitman of a band wheel and winding drum.
- 524,268. Oil Burner. Richard Walten and Thomas Rees, Altoona, Pa. Burner of the spray type with annular opening.
- 524,289. Fuel Oil Burner. Robert L. Underwood, Toledo, O., Assignor to Amos H. Boardman, same place. Combination of heater, supply and burner pipes.
- 524,296. Boiler furnace. William R. Parks, Palmer, Mass. Water grate, through which the feed-water is forced before entering the boiler.

Great Britain.

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

WEEK ENDING AUGUST 4TH, 1894.

- 13,406 of 1893. La Compagnie Electro-chemique de St. Beron, France. Application of the electrolysis of salt to produce hypochlorite of soda.
- 13,769 of 1893. W. Thomlinson, West Hartlepool. Consolidating finely divided iron ores by mixing with blast furnace slag.
- 24,900 of 1893. E. A. E. Wernberg, Falun, S. Carreck and J. G. Johanson, Gefle, Sweden. Separating oxides of zinc, iron and copper from oxide of cobalt, by treating with hydrochloric acid, driving off the volatile chlorides of zinc, iron and copper, and afterwards reducing the chloride of cobalt to oxide by the application of a higher degree of temperature.
- 5,891 of 1894. W. Barns & Co., Hillson, London. Improvements in miners' safety lamps.
- 8,061 of 1894. H. Carmichael, Malden, Massachusetts. Improvements in Electrolytic Apparatus.
- 10,780 of 1894. P. A. Crullins, Smedjebacken, Sweden. Method of making rock drill so that the broken tool may be easily withdrawn from the hole.
- 11,148 of 1894. O. Nicolai, Wiesbaden. Flux for soldering aluminum, consisting of cadmium-halogen compounds.

PERSONALS.

President D. H. Bacon, of the Minnesota Iron Company, has been seriously ill for some time, but is now somewhat better.

Mr. John R. Farrell, formerly connected with the Eastern Oregon Mining Company, is now in charge of the Baisley-Elkhorn mine, at Elkhorn Mountain, Oregon.

Mr. H. A. Wheeler, mining engineer, has recently resigned from the chair of mining at the Washington University, St. Louis, and moved to 2700 Pine street, St. Louis, in order to devote his entire time to his growing professional interests.

Mr. Frank Mericks, of the firm of Biley & Co., of London, left England last week for New Zealand by way of New York and San Francisco. He will make inspections of several mining properties in the Australasian colonies and New Caledonia.

OBITUARY.

John Becker, a well-known ironmaster, died at his home in Chickies, near Marietta, Pa., on August 11th, aged 76 years. He operated the well-known Chickies Rolling Mill with great success for many years.

J. H. Platt was drowned at Green Lake, Colo., on August 12th. He was born in Vermont. After the war he came to New York and became interested in the oil refining business. He was for a number of years president of the Platt & Washburn Company, oil refiners, and resigned from that position in 1885 to go to Denver, where he started in the paper manufacturing business, and was head of the Denver Paper Mills at the time of his death.

SOCIETIES AND TECHNICAL SCHOOLS.

International Geological Congress.—The meeting of this body begins at Zurich, Switzerland, August 29th, and will continue until September 2d. It is preceded by an excursion through the Jura region from August 15th to August 28th, and will be followed by a similar excursion in the Alps from September 3d to September 15th.

Among the distinguished authors who have promised papers are Mr. Archibald Geikie, M. Michael Levy, Dr. E. Suess, Dr. K. von Zittel, Prof. Marcel Bertrand and Prof. Albert Heim.

American Institute of Mining Engineers.—As already announced, the 67th meeting of the Institute will be held at Bridgeport, Conn., beginning Tuesday evening, October 2d. Dr. Leonard Waldo, Bridgeport, Conn., is the representative of the local committee. Hotel headquarters will be at the George Hotel, Black Rock Beach, Bridgeport. Conveyances can be obtained from the Bridgeport railroad station to the hotel. Hotel rates to members and guests of the Institute for the first week in October, \$2.50 per day. Applications for reserved rooms should be addressed to the clerk of the hotel. The excursions connected with the meeting will include visits to brass and copper mills, a water excursion, and a trip by special train through the Naugatuck Valley. Members proposing to present papers at this meeting should communicate immediately with the secretary.

Volumes XXII. and XXIII. of the "Transactions," containing the papers and discussions of the Chicago meeting of August, 1893, have been distributed to all members not in arrears.

Iron and Steel Institute of Great Britain.—The autumn meeting will this year be held in Brussels, under the presidency of Mr. E. Windsor Richards. It is 21 years since the members met in Belgium, the autumn meeting of 1873 having been held in Liege. The Brussels meeting will begin on Monday, August 20th, and will end on Friday, August 24th. It is expected that the meeting will be very numerously attended, about 500 members in all having intimated their intention of being present. The arrangements for the meeting have been organized by a local reception committee, of which M. Gillon, president of the Society of Engineers of Liege, is chairman, in conjunction with the general secretary of the institute, Mr. Bennett H. Brough. Upon the arrival of the members in Brussels on August 20th, there will be an evening reception by the Burgomaster at the Hotel de Ville, to which ladies are invited. The morning of Tuesday will be devoted to the reading and discussion of papers in the hall of the Bourse, while the afternoon will be given up to a visit to the Antwerp International Exhibition. Further papers will be read and discussed on Wednesday morning, and in the afternoon places of interest in the city will be visited. On Thursday the members will leave Brussels by special train to visit the Marienort Collieries and the Couillet Steelworks at Charleroi, returning to Brussels in the evening. The last day of the meeting will be devoted to a visit to the works of the Cockerill Company at Seraing and the Angleur Steelworks at Liege, the members returning to Brussels in the evening. There are 10 papers for reading and discussion set down in the list. Of these the first will be "On the Use of Caustic Lime in the Blast Furnace," by Sir Lowthian Bell. The history of crucible steel will be treated by Mr. R. A. Hadfield, while papers on other branches of metal-

lurgy and metallurgical chemistry will be contributed by Messrs. T. W. Hogg, H. C. Jenkins, W. G. McMillin, John Parry and D. Selby-Bigge respectively. Two papers of local interest will be contributed by Belgian engineers, namely: "On the Coal Mining Industry of Belgium," by M. Briart, president of the Society of Engineers of Hainaut, and "On the Iron and Steel Industries of Belgium," by M. A. Gillon, president of the Society of Engineers at Liege.

American Association for the Advancement of Science.—The sessions of the scientific societies meeting in Brooklyn, preliminary to the general meeting of the American Association, began August 13th. On the following day, August 14th, there were gatherings of the members of the Association of Economic Entomologists, the Geological Society of America, the Society for the Promotion of Agricultural Science, and the American Mathematical Society. The American Microscopical Society continued its meeting.

The council of the Geological Society of America met August 14th at the Hotel St. George, and the first session of the society followed at the Packer Institute. Vice-President N. S. Shaler, of the University of California, presided. The transaction of business, including the vote for new members and the appointment of a committee to consider a communication from the Royal Society of Great Britain, occupied the first half hour. The committee was composed of Professors Shaler, Williams and McGee. Prof. H. L. Fairchild, secretary, reported the programme of papers to be presented before the society. The following persons were elected fellows of the society: Miss Florence Bascom, Columbus, O.; Richard Charles Hills, Denver, Col.; Elfric Drew Ingall, Ottawa, Can.; Robert Tracy Jackson, Geneva, N. Y.; Charles Joseph Norwood, Frankfort, Ky.; Charles Palache, Berkeley, Cal.; Louis Valentine Pirsons, New Haven, Conn.; Henry Lloyd Smyth, Cambridge, Mass.; Lewis Gardner Westgate, New Haven, Conn.; and William Smith Yeaten, Atlanta, Ga. The first paper read before the society was by J. F. Kemp, of this city, upon "The Nickel Mine at Lancaster Gap, Pa., and the Pyrrhotite Deposit at Anthony's Nose, on the Hudson." Alfred C. Lane, of Houghton, Mich., followed with a paper upon "A Connection Between the Chemical and Optical Properties of Amphiboles."

The members of the Association of Economic Entomologists assembled at the Packer Institute for their sixth annual meeting, L. O. Howard of Washington presiding. President Howard read an extended address upon "The Rise and Present Status of Official Economic Entomology."

The Society for Promotion of Agricultural Science began its fifteenth annual meeting August 14th also. William Saunders, of Ottawa, Canada, is president, and William Frear is secretary.

Emory McClintock, LL. D., of New York, presided over the meeting of the American Mathematical Society in the Polytechnic Institute, which opened August 14th. He read two papers to his fellow members, one upon "Theorems in the Calculus of Enlargement," and the other "On the Expression of the Roots of Algebraic Equation by Means of Series." Prof. Frank Morley read a paper upon "Elliptic Functions and the Cartesian Curve."

The members of the American Mathematical Society on August 15th listened to expositions "On the Fundamental Laws of Algebra," by Prof. Alexander MacFarlane, of the University of Texas; "About Cube Numbers whose Sum is a Cube Number," by Dr. Artemus Martin, of Washington, and "Bertrand's Paradox and the Non-Euclidean Geometry," by Prof. George Bruce Halsted, of the University of Texas.

An important paper was read by Dr. W. W. Allenger, of Washington, D. C., before the members of the American Microscopical Society, upon "Limitations of Tuberculosis."

The Geological Society of America continued its meeting August 15th with the reading of several papers as follows: N. S. Shaler, "Evidences as to the Change of Sea-level"; W. J. McGee, "The Extension of Uniformitarianism to Deformation"; Warren Upham, "Tertiary and Early Quaternary Lake Levelling in Minnesota, Manitoba and North-westward"; Warren Upham, "Departure of the Ice-sheet from the Laurentian Lakes"; Ralph S. Tarr, "The Drumlinoid Hills near Cayuga, N. Y."; D. F. Lincoln, "Drumlins in the Vicinity of Geneva, N. Y."; George H. Barton, "Channels on Drumlins, Caused by Erosion of Glacial Streams"; Harold W. Fairbanks, "Review of Our Knowledge of the Geology of California Coast Ranges"; Arthur Winslow, "The Geological History of Missouri"; C. W. Hall and F. W. Searleson, "The Magnesian Series of the Northwestern States"; Charles H. Gordon, "The Stratigraphy of the St. Louis and Warsaw Formations in Southeastern Iowa"; Charles S. Prosser, "The Permian Carboniferous and Permian Rocks of Kansas"; James Perrin Smith, "The Trias and Jura of Shasta County, California"; N. H. Darton, "Cenozoic History of a Portion of the Middle Atlantic Slope."

Before the society of Economic Entomologists papers were read by L. O. Howard of the Agricultural Department, who exhibited a destructive scale insect; G. C. Davis, of the Michigan Agricultural College; A. D. Hopkins, of Morgantown, W. Va., and J. M. Aldrich of Idaho.

A number of papers upon subjects closely connected with scientific agriculture were read before the members of the society for the Promotion of Agricultural Science in the Packer Institute.

On August 15th the Council of the American Association for the Advancement of Science, held its

43d annual meeting at the Hotel St. George in Brooklyn. The session was preliminary to the annual meeting of the association, which opened August 16th in the Polytechnic Institute, and will remain in session until Wednesday of next week. The principal business was the election of new members. About 200 names were presented, of whom 99 were sent in by the Brooklyn committee on new members.

The American Chemical Society began its ninth general meeting August 16th in the Polytechnic Institute. There was a large attendance. William McMurtrie, chairman of the committee of arrangements, made the address of welcome. President Wiley made a response to the welcome of the committee, congratulating the society upon its increasing influence and its continued advance. The reading of papers was then begun by L. M. Dennis, who presented the result of investigations by himself and W. H. Magee of Cornell, entitled "Contributions to the Chemistry of Cerium." The other papers before the society will be: "Note on Hardening of Mortar," William P. Mason; "Note on Test for Strychnine," William P. Mason; "The Quality of Water Supplies," William P. Mason; "The Bacteriology of the Soil as Affected by Depth, Character, and Use," Lucius Pitkin; "Utilization of Acid Sulphates, Particularly the so-called Nitre Cake of the Trade," John Enquist; "Oil Gas," W. A. Noyes; "Determination of Benzene in Illuminating Gas," W. A. Noyes.

INDUSTRIAL NOTES.

The Blairville (Pa.) Rolling Mill and Tin Plate Company has put its plant in operation.

The Alabama Pipe Company, at Bessemer, Ala., is averaging about a carload of castings per day.

The Otis Steel Works, Cleveland, O., started the plate mill and forge last week, employing about 500 men.

The Aetna Standard Oil Works, at Bellaire, Ohio, are again in operation, after an idleness of ten weeks, and 2,000 persons are at work.

The Buffalo, N. Y., Furnace Company, which has been idle for several months, has gone into blast again, giving employment to 200 persons.

The Southern Malleable Iron Works, Chattanooga, Tenn., has received an order from the Southern Agricultural Works, Atlanta, Ga., for a large number of castings.

The plant of the Montour Iron and Steel Company, Danville, Pa., is running in all departments upon full time and is turning out large quantities of manufactured iron.

The Pittsburg Steel Casting Company has its plant in operation to nearly full capacity, and reports more orders on hand at this time than during any period of the last 18 months.

The Pittsburg Bridge Company, Pittsburg, Pa., has secured a contract from the Ansonia Copper Company to furnish an iron roof for one of its buildings, 80 x 100 ft., at Lordsburg, N. M.

The nail factory of the Ellis & Lessig Iron Works at Pottstown, Pa., which was destroyed June 10, has been rebuilt of iron and will resume operations on August 14th with 100 nail machines.

The Tanite Company, of Stroudsburg, Pa., has issued a catalogue in which are many useful hints as to the use of Tanite wheels, as well as descriptions of the various forms of wheels which it manufactures.

All departments of the Reading Iron Company, Reading, Pa., are now running almost full handed. No. 5 mill and No. 4 lap-weld furnace started up on August 14th. There are now about 600 men employed.

The Pittsburg Bridge Company is working on an addition to the casting plant of the Midvale Steel Company, Nicetown, Philadelphia. About 160 tons of steel will be used in the construction of the building.

The Worthington Hydraulic Works at Brooklyn, N. Y., has decided to make large additions to its already extensive plant and has placed the contract for this work with the Berlin Iron Bridge Company, of East Berlin, Conn.

William Todd & Co., of Youngstown, O., are rushed with orders in both foundry and machine shop. They have four large engines in process of completion in the erecting room, and a large amount of heavy work on hand.

The bar mill of the Keystone Rolling Mill Company, Pittsburg, was damaged by fire a few days ago. The shafting in the muck mill, together with a number of new scales, was entirely destroyed. The damage will amount to \$20,000.

The Johnson Steel Company has executed a mortgage to the United States Trust Company, of New York, to secure an issue of \$2,000,000 in bonds. The mortgage covers all the property of the company at Lorain, O., where its new plant is now being erected.

Heyl & Patterson, Pittsburg, have the contract to put up a boiler-house for the new plant of the

Westinghouse Electric and Manufacturing Company, of Brinton Station; also a plant for the South Side Gas Company for storing coal, which will have a capacity of 33,000 bushels.

The Davis Coal and Coke Company, of Baltimore, has perfected arrangements with the government by which the latter will use the company's coke on the steamer Dolphin, so as to try it as compared with coal. The recent experiments made on the yacht Comet with this fuel were so successful that great interest is felt by naval officers in the forthcoming trial.

Harvey Continental Steel Company, Limited, has been registered in London with a capital of £120,000, in £10 shares, to carry on the business of manufacturers of armor plates and plates of all kinds; to follow the trades of steel and iron masters, brass-founders, smelters, metallurgists, colliery proprietors, and to enter into a certain agreement.

The Hydraulic Machine Company, Pittsburg, is building for the Cambria Iron Company, Johnstown, Pa., a three 40-in. cylinder shear to cut slabs with a section of 18 x 30 in. This shear is similar to those built last year for the Pennsylvania Steel Company, at Steelton, and the Central Iron Company, at Harrisburg, except that they are much heavier, the cylinders being 10 in. larger in diameter.

It is understood that early in October 20,000 electrical horse power generated at the Niagara Falls plant would be available in Buffalo. After that date the construction of lines east of Buffalo will be commenced, and it is expected that Rochester will be reached by April 15th next. The line will be erected along the banks of the Erie Canal for the purpose, mainly, of supplying electric motive power to canal boats.

A catalogue has been issued by George L. English & Company, of 64 East Twelfth St., New York City, containing a list and description of the minerals and gems which they have on hand, with the prices for small and large collections which they furnish to students and others interested. The catalogue has 124 pages, and contains some valuable information regarding collections and mineralogical supplies.

Erie City Iron Works have made sales of boilers recently as follows: 500 H. P. to the Steubenville (O.) water works; 100 H. P. to the McKeesport (Pa.) water works; 400 H. P. to the Morton Tin Plate Company, Cambridge, O.; 100 H. P. to the Washington (Pa.) Carbon Company; 150 H. P. to the Pittsburg, Fairport & Northwestern Dock Company, Superior, Wis.; 100 H. P. to the Jamison Coal Company, Greensburg, Pa.

The Joseph Dixon Crucible Company, Jersey City, N. J., manufacturers of lead pencils, crucibles, stove polish and other graphite products, says that in times like these, when work is none too plenty, and the manufacturer is anxious for orders, there is great temptation to cut prices for the sake of getting a quantity of business, forgetful of the fact that the more business one does at a loss the slimmer will be the bank account at the end of the year.

The Repauno Chemical Company, of Wilmington, Del., has just manufactured a few oak and mahogany cases containing samples of its grades of Atlas and Judson powder and Repauno gelatine. They were originally made for the Columbia College School of Mines, in New York City. Each sample in the case is numbered, with particulars regarding qualities. The samples are in a tube with a glass end, so the appearance of the grains can readily be seen. It is the intention of the Repauno Chemical Company to send samples in handsome cases to many of the prominent mining schools in the country.

MACHINERY AND SUPPLIES WANTED.

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

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

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

GENERAL MINING NEWS.

President McBride, of the United Mine Workers, has decided that silver miners are eligible to membership in his organization, which was at first formed to include only coal miners. It is expected that the decision will result in bringing 50,000 miners into the organization.

The July business through the Soo Canal in the freight tonnage shows a decrease of 379,565 tons from July, 1893. Passages, passengers and registered tonnage show an increase. It is expected that from now until the end of the season the business will show an increase over any corresponding months in the past. Following is the July report of the canal: Passages, number, 2,084; registered tonnage, 1,728,904; freight tonnage, 1,637,618; passen-

gers, 7,249; lockages, 961; aggregate time consumed by vessels in passing, 1,068 hours and 15 minutes. In July of last year there were 2,078 vessels. In all 4,696,000 ft. of logs passed over the rapids during the month, bound for points on Lake Huron.

The strike commission appointed by President Cleveland to investigate the Pullman and railroad strike began its work in Chicago, August 15th. The sessions are held in the government building. Vice-president S. W. Howard, of the American Railway Union, was the first witness.

Exports of mineral oils in July are reported by the Bureau of Statistics, Treasury Department, at 72,022,355 gals., a decrease of 4,092,117 gals., or 5.4%, as compared with July, 1893. For the seven months to July 31st the exports were: Crude, 63,359,210 gals.; naphthas, 6,671,765 gals.; illuminating oils, 402,123,942 gals.; lubricating and paraffin, 21,339,028 gals.; residuum, 27,258 gals.; total, 493,521,203 gals., valued at \$21,953,509. This is an increase of 22,914,023 gals., or 5.9%, over the corresponding period in 1893.

ALABAMA.

The 2,000 striking miners of the Tennessee Coal, Iron and Railroad Company, at Birmingham, have agreed to go back to work at the company's terms.

Cherokee County.

(From our Travelling Correspondent.)

Tecumseh Iron Company, Tecumseh.—This company has secured such extensive contracts for brown ore that the force of employees at Baker Hill banks will be increased shortly to the same number employed previous to the depressed condition of the iron market. The company is increasing the water supply for the washer by sinking one of the wells, which has heretofore furnished a large quantity of the water, a greater depth. In doing this a steam drill and steam hoist will be used, and as the well is located on the bank of a pond produced by a lime sink, it is expected that the additional depth attained will result in furnishing a sufficient quantity of water to relieve all apprehension of any such inconvenience in future, as has been experienced during the present summer; which has been so exceptionally dry that the spring from which a pipe line 2½ miles in length was laid some years ago, has failed to furnish its usual supply. The State line banks of this company are being operated as extensively as the limited supply of water for the washer at those banks will permit.

Shelby County.

(From our Travelling Correspondent.)

Shelby Iron Company, Shelby.—The location of this company's mines and furnaces is near the southern end of the Alabama brown hematite ore district. It is among the first producers of forge iron in the South, and was worked nearly 50 years ago. Since then the old forge and hammer have given way to two 60 ton hot blast charcoal furnaces and the Shelby car wheel pig ranks first among the hot blast charcoal irons. The ore here carries less phosphorus than probably any other place in Alabama, averaging from .35 to .40%, run of the mine, and about 7% silica. These ore banks are adjacent to the furnaces, and have been mined to a depth of about 100 ft. during the past 40 years. The quantity of ore is apparently almost inexhaustible, and a sufficient quantity to furnish both furnaces is easily mined by the aid of a steam shovel, which is being run to-day almost to its capacity, although one furnace only is in blast, which does not consume all the ore taken out, the surplus being stored to await the blowing in of the second furnace. The ore is washed in a McCallahan & Stone improved washer and transferred to a Davis & Colby roaster, the only one in use in the State, where it is subjected to a thorough calcining, and charged into the furnace hot. The fuel used in the roaster is coal gas produced from Alabama coal by a Taylor producer. By this practice the fuel necessary to melt the ore in the blast furnace is reduced to a minimum, less than 100 bushels of charcoal only being necessary to produce one ton of pig. The ore as it is charged into the furnace exceeds 65% of metallic iron. During the month of June last the output from the one stack was 1,894 tons. Capt. T. G. Bush, of Anniston, the president of this company, also of the Clifton Iron Company, at Ironton, in Talladega County, informs me that since April, 1890, he has succeeded in reducing the cost of manufacturing pig at Shelby \$6 per ton less than the cost previous to that date, and in figuring cost he includes every expense incidental to the production, including 40c. a ton for extraordinary expenses, which is placed to the credit of a fund for that purpose monthly, to be used in case of accident, or for relining. While he objected to giving me the exact cost of production at either of the plants, yet he informed me that he was to-day producing high grade car wheel pig cheaper than at any other point in the States.

ARIZONA.

Yuma County.

Harqua-Hala Gold Mining Company, Limited.—During June milling operations at this company's property have been steady. The superintendent reports that the new battery of stamps is working well. The following figures represent the month's operations: Tons crushed, 3,262; amalgam cleaned up estimated to yield \$36,500; miscellaneous revenue (profit from general store, estimated, \$500; total, \$37,000; expenses on revenue account, \$13,000; estimated profit for the month, \$24,000; average loss in tailings, \$3.82. Every department is in good working order.

CALIFORNIA.

No permits were granted at the last meeting of the California Débris Commission. A number of applications to mine by the hydraulic process are pending, however, and will be heard this week.

Very little hydraulic mining on the watershed of the Sacramento river is being done this summer, so far as the Commission is informed. The only large mines now in operation by permission of the Commission are the Farrell mine at Columbia Hill and the Manzanita mine at Sweetland. Both are on the San Juan ridge and drain into the Yuba river.

The Green Meadow mine in Calaveras County is also being worked by approval of the board, but it is a relatively small property. There are a considerable number of mines authorized to work by the hydraulic process, but most of them are entirely short of water at this time and must wait until the next season of rains before resuming the use of the monitor.

The North Bloomfield mine, which is the chief hydraulic property in Nevada County, if not in the State, is working independently of the commission. It is claimed to be operating by virtue of a modification of an injunction issued in an anti-debris suit.

The tailings from the washing are supposed to be discharged into a worked-out pit on the company's property which was originally filled with sand and gravel long since carried away by the streams from the monitors.

The necessity of impounding debris, under the terms of the Caminetti Act, has had the effect of greatly restricting hydraulic mining operations under the authority of the commission, says the San Francisco "Bulletin." Many mines which formerly discharged their tailings directly into the water course are so situated that their owners find it impracticable to construct restraining works, save at a cost that would be virtually prohibitory. And in the case of the mines that have storage facilities much more discrimination is exercised than was formerly shown as to the nature of the material washed. Formerly millions of cubic yards of sand and clay, which did not pay to wash, were torn down by the monitors and swept away into the streams, in order that the pay gravel on the bedrock might be reached.

As the storage capacity, in nearly all instances, is comparatively scanty, and the construction of restraining dams a matter of heavy cost, the miners obtaining permits are disposed to confine their operations to those portions of their claims which can be worked with the least product of detritus or debris in proportion to the gold obtained. Besides, there is need of care to comply with the requirements of the law, as a failure to do so may result in a forfeiture.

On the Klamath and its tributaries, to which the terms of the Caminetti Act do not apply, those waters not being navigable, hydraulic mining has been greatly extended in the past few years. A large amount of foreign capital has been invested there, and hydraulic mining is going on with unrestricted energy.

Butte County.

Denver.—This mine at Forbestown has just shut down, throwing about 40 men out of employment. The bond has expired on the property and the parties who had it leased did not desire to make a purchase.

Gold Bank Tunnel Company.—This company at Forbestown has just commenced to drive a 1,200 ft. tunnel in from the Feather River side. The company expects to erect 80 stamps more in the near future.

Inyo County.

Mazourka.—The miners of Mazourka canyon continue to bring in gold, says the Inyo "Independent." Last week over \$600 worth of gold dust was brought to Independence from the lately discovered placers. At present there are but few men working, owing to the scarcity of water. The Mexican Gulch continues to yield good returns. All the work yet done has been superficial.

Mono County.

Bodie Consolidated Mining Company.—The superintendent's official letter for the week ending August 5th says: We hoisted from the workings above the 300 ft. level 34 tons of ore. Total number of tons hoisted to the surface 181 tons. We are getting some bunches of fair grade ore from the slopes above the north drift on the 300-ft. level. Upraise from south drift from No. 1 upraise, 300 ft. above the 300-ft. level, was extended 9 ft. The cre in the face is about 7 in. wide and is of good quality. South drift from west crosscut on Standard line, 400 level, was extended 12 ft. There is about 18 in. of quartz and clay in the face. South drift, 60 ft. above the 400 level, was extended 7 ft. and an upraise started at the face in a quartz seam 2 in. wide and extended 8 ft.

Nevada County.

Consolidated Wyoming Gold and Silver Mining Company and Champion Gold Mining Company.—A decision in this mining suit has been rendered in the United States Circuit Court at San Francisco. The action was for an injunction and an accounting, and the point at issue was the ownership of a valuable ledge of ore running underground from the Wyoming mine into the Champion property. Judge Hawley grants the accounting and injunction.

Eagle Bird.—This mine above Maybert, is said to be looking well, and a 30-stamp mill is about to start up on its ore.

Evening Star Mining Company, Grass Valley.—In this company's mine the shaft has cut the main ledge and the ore taken out is said to be even richer than that from which such good milling returns were received at the other end of the mine.

Fourth of July.—A discovery was made not long since in this mine, says the Plumas "National Bulletin," and developments resulted in finding a well-defined ledge of good milling ore from 3 to 4 ft. wide.

Osecola.—The ledge has been found in this mine, below Rough & Ready. It is said that the ledge is from 2 to 3 ft. thick, and that it shows well in free gold and also that the sulphurets in the rock are worth over \$100 per ton.

Plumas County.

Plumas Imperial.—This hydraulic mine has closed down for the season owing to the lack of water. Washing has been suspended and the bedrock and sluices cleaned up. The yield of gold was satisfactory, considering the short time the mine was in operation. The company had considerable work to do last spring, and did not get to washing gravel until the water season was nearly over. However, a large gravel channel was opened up, containing much coarse gold, as well as a good yield of the finer quality.

Riverside County.

Good Hope.—This mine now runs a 9-hour shift at night and 10-hour in the day time. There would be three shifts of 8 hours each if there was water enough. This mine keeps four teams continually hauling coal from the Elsinore mine.

Sierra County.

Empire.—A. Maltman and S. W. Thompson, of Grass Valley, have completed the sale of the Empire mine, a few miles above Downieville, to a San Francisco company for \$50,000. The ledge is said to be rich in high grade sulphurets.

Siskiyou County.

Hungry Hill.—This quartz ledge on Know Nothing Creek, in the Salmon River section, was bonded lately for \$100,000, but the holders of the bond failed to close their bargain. The quartz from this ledge gives very high returns.

Tuolumne County.

Black Oak.—Thomas Ewing, of San Francisco, has secured a controlling interest in the Black Oak mine, at Soulsbyville. The Tuolumne "Independent" says that he will erect chlorination works at once, also enlarge the hoist and increase the capacity of the mill, etc.

COLORADO.

Chaffee County.

Pawnee Mill and Mining Company.—This company at St. Elmo is running full capacity. The ore does not run very high, but 15 to 20 tons per day go through the mill, saving 85% or more of the value.

Clear Creek County.

American Sisters.—This mine near Lawson is working steadily. A new air compressor is being put in on the first level, with the intention of sinking the main shaft 75 ft. deeper, making it 375 ft. deep, says the Idaho Springs "Gazette." The mine employs 20 men. On the second level Bennett & Co. have a good streak of 142-oz. ore. Curin & Johnson, on the third level, have taken a new lease. Johnson Bros. have a 6-in. streak of 161-oz. ore on the fourth level.

Custer County.

Geysers Mining Company.—Active preparations are now being made at the Geysers for the further sinking of the main shaft, says the Silver Cliff "Rustler." The 1,850 and 2,000 levels will soon be connected by a winze, and as soon as this connection is made stopping will be commenced from the ore seam known to exist continuously between these two levels. Superintendent Johnson writes from Boston that the stockholders are pleased over the present developments, and that the work will be vigorously pushed in all directions. The first shipment of ore to the smelters from this mine will be made in about 10 days.

Eagle County.

Buena Vista.—The leasers on the Buena Vista and Iron Will have broken into an ore body on the former at the breast of the tunnel, about 300 ft. from the surface. The property is located about one mile from Red Cliff, on Battle Mountain. According to the Red Cliff "Blade," about 100 sacks of rich ore have been extracted since the strike. Enough work had not yet been done on the ore body to determine its extent, but indications are that it is good sized. It is between the lime and the porphyry and seems to be in place. Samples of the ore body tested give very high returns in silver, with very little gold.

Holy Cross District.—The local papers report that quite a boom has recently started in the Holy Cross mining district. Messrs. Kimball, Havens and Davis, and a syndicate with headquarters at Portland, Me., are now remodeling the old Gold Park Mining Company's mill at Holy Cross and expect to be running within forty days. The new machinery which has been shipped will arrive at Red Cliff in a few days and will be forwarded to Holy Cross as soon as received. The ore is of a low grade. The company will put up a mill. It will also sink and drive on the Little Mollie. The property is one of the best in the camp and has a true fissure vein. In the lower tunnel is a chimney of sulphide ore, about 90 ft. long, and varies from 1 to 12 ft. in width. The

ore is low grade. The company intends to operate the Pelican, Pelican Extension, Calumet and Delphine. These properties, together with several others, were formerly owned and operated by the Gold Park Company under the management of J. W. Bailey. They expect to put on a force of men to take out ore as soon as they can get the mill in operation.

Lying on the south side of French mountain is an immense porphyry dyke. In this dyke are many good fissure veins. Among the most prominent properties are the Heckley, Australia, Shamrock, Grand Trunk, Comstock and Backis. These veins are all said to be true fissures, and have from 1 to 10 ft. of good ore. They are easily worked, as they lay in the porphyry formation.

El Paso County.

The Lawrence mill, recently purchased by Capt. J. R. De Lamar, is receiving a thorough test as to what it can do in treating of Cripple Creek ores, says the Cripple Creek "Journal." It has been demonstrated that the actual cost of treatment does not exceed \$5 per ton, and making a good saving at that. This being the case, it will enable the miner to ship a much lower grade of ore than heretofore. The treatment charge at the Lawrence mill has been something like \$12 per ton. By the time that the miner paid for hauling to the mill and stood the 5% loss on the assay value there was not much left to him on ore running as high as \$18 or \$20, but it is found that the mill can treat ore for \$5 per ton, or add \$2 to that, making it \$7, then you will give a market to ore running as low as \$12 and \$15 per ton.

Kittie.—C. B. Clements has opened up a vein on the Kittie, under lease and bond from the Gould Company, and, at a depth of 15 ft., 18 in. of smelting ore is exposed.

Nugget Mill and Mining Company.—The Catherine, on Raven Hill, owned by this company, has better ore and more of it exposed now than ever. Ten tons of first-class ore is being mined daily, and as much more is being housed and saved for the mill. A few days ago a new vein running almost parallel with the old one was accidentally discovered. A plant of machinery is to be placed on the mine shortly.

Portland Mining Company.—This company, since its recent purchase of mining properties, is doing considerable prospecting over them. A new shaft on the Queen of the Hill will be in operation in about a fortnight. Manager Harman says that from that claim alone he expects to send 100 tons a day to the smelter. The old Portland proper is producing 40 tons a day of high grade ore.

Gilpin County.

During July 179 carloads of ore and concentrates, aggregating 5,000,000 lbs., were shipped from Black Hawk to the smelters at Denver and Argo. This is an increase of 56 carloads over the corresponding period of last year. There is great activity in mining circles all over Gilpin County, and the prospects are good for a continued increase in the ore production the coming fall.

Gunnison County.

(From a Special Correspondent.)

Gothic District.—Mining matters about Gothic are quite dull, and there are but two properties being worked now, the Sylvanite and the Moss Rose No. 2. On the Sylvanite they are working about 15 men, and on the Moss Rose but three. The Moss Rose is getting out a carload of ore, and it now promises to be very high grade. They hope to ship about September 1st.

The Sylvanite is driving an upraise from the lower tunnel to the winze in the upper workings, a distance of 475 ft. They are within 100 ft. of the winze, and are prospecting the vein at different points. It promises well all along. They are running by compressed air, and are now planning to change the steam plant to a water power plant. The grade in this and the Moss Rose properties, which are on the same vein, is very high. The location geologically is the same as the mines on Aspen Mountain at Aspen, and is only about 18 miles distant from them. Its ore is quite similar in character to the Aspen ore.

Lake County.

(From our Special Correspondent.)

C. M. Fraction.—Lessees are sinking the shaft in a formation of honeycombed lime in which indications of mineral are very good. After sinking the shaft a little further a drift will be run with the hopes of catching the Doris ore chute.

Indiana Mining Company.—Some important improvements have been made at the Walcott shaft and a new plant of machinery has been put in place. Shipments for July averaged 700 tons. All the ore is hoisted through the Esther shaft, where important new work is in progress, and a new drift is in contact matter that carries a small percentage of lead and silver. Nearly all of the ore carries some gold, and Manager J. W. Newell believes that there is a good gold ore chute somewhere in his property.

Low Pass District.—The property above mentioned lies in this district and there are about 50 men working in that section. The Birthday is down 50 ft. and is taking out ore some of which will run 12 to 15 ozs. The vein is 3 ft. wide. The Extension being worked by lessees has a pay streak 6 in. wide averaging 7 to 8 oz. gold. In the General Logan a drift has been run 90 ft. and is in ore that assays well. The vein on the B. & M. is 2 ft. wide,

composed of good milling ore. The shaft is being sunk on a streak running 4 to 6 oz. gold.

Matchless.—This property, owned by H. A. W. Tabor, et al., is to be started up after an idleness of 14 months. There are large reserves of iron ore, for which it is understood a contract has been made, so that shipments will be resumed at once. Seventy men were put to work this week. The shaft will be sunk 200 ft. deeper.

Monte Cristo.—In this property lying in the granite section a good strike of gold ore was made this week. The ore is an iron quartz. The pay streak will run 8 7/8 oz. gold, while the vein will average \$12 to \$15 to the ton.

Olga.—A new leasing company has been formed to develop this property. While the shaft is down 310 ft. it is believed that the ore chute is above and an upraise is to be made into the quartzite.

R. A. M.—A number of men have been laid off at the Marian shaft on account of the inability of the company to ship at the present price of silver. Some development work, however, is being done.

Smith Moffat Group.—The July production was as follows: Maid of Erin, 391 tons sulphide; 2,911 tons carbonate; 1 1/2 tons of iron. Grey Eagle Consolidated, 383 tons carbonates; 1,486 iron. Orion, 396 tons carbonates. The Grey Eagle property has greatly curtailed its iron shipments.

Union Leasing and Mining Company.—This company is operating five different shafts from all of which good mineral is being taken. The shafts are of the Ward Consolidated group and include the Tip Top, Bangkok, El Paso and Olive Branch. Through the Olive Branch ore is being hoisted from the Forepaugh, Jennie Lee and Alpha, while much virgin ground is being prospected through the El Paso shaft. The Jennie Lee is still sinking and is down 450 ft. in the lime. There are six Ingersoll drills in constant use. Two hundred men are employed and daily shipments average 100 tons of a fine grade of sulphide ore with some carbonate.

La Plata County.

(From our Special Correspondent.)

Bull Domingo.—This is a prospect located in the granite north of Basin Gulch, near the county road to Durango. The ore is a high grade tellurium. A mill run of 900 lbs. recently showed a value of \$78 per ton, mostly gold.

Fredrickton.—A. Montandon, manager of the La Plata Mountain Mining and Milling Company, has recently purchased this property, and it is now being developed.

Montezuma Group.—This group, consisting of five claims, has also been purchased by the La Plata Mountain Mining and Milling Company. This group is quite extensively developed and shows an ore body from 12 to 16 ft. wide, with an average value of \$20 per ton. The company now owns a number of mining properties in La Plata, and as soon as the newly acquired properties have been thoroughly tested work on mills will commence. Mr. Trashler, of New York, the company's expert, reported recently that he had solved the problem of treatment for the La Plata refractory ores. What he claims is not fully known.

Small Hopes.—This property is located a quarter of a mile north of Basin Gulch. While sinking the discovery shaft, now 18 ft. from the surface, about 2 tons of ore have been taken out a mile, some of which showed a value of \$105 per ton. The vein is strong and well defined in perfect walls, such as seldom are to be found in this district.

Mineral County.

Amethyst Mining Company.—Capt. L. E. Campbell, general manager of this company, is quoted by the Denver papers as saying that unless a body of shipping ore is encountered by the middle of next month the mine will be closed down. He says No. 3 shaft will be sunk 100 ft. farther, and the 7th level drift will be run 110 ft. more. From the first of the year up to last week the company has sunk 365 ft. in No. 3 shaft, and run 900 ft. of drift in the 7th level without striking a pound of pay ore. The trouble is that the Last Chance sulphide vein, for which the company has been prospecting the past months, while pitching toward the Amethyst, pitches so slightly that it is impossible to say at what depth it would be encountered, and there is not sufficient encouragement offered in the sale of the product to continue the heavy expenses further. The company is now employing 52 men.

Creede's ore shipments for June were 383 cars, and for July 267 cars, making a total of about 8,000 tons for the two months.

Park County.

Park County Gold Mining Company.—A deed was entered of record on August 9th at Fairplay, conveying to this company 600 acres of placer lands in the Tarryall district, embracing the Hubbard, Barrett and Taylor placer mining claims, together with an additional tract, for a consideration of said to be \$749,500. The members of the new company are Massachusetts and California people, who associate themselves with Mr. John Fortune, the manager of the Alma placers, and owner of the properties sold. Much of the ground embraced in the new company's property has been thoroughly tested and proved rich in placer gold. Preliminary arrangements, it is said, will begin in a very short time on extensive plans for next season's work, when heavy giants and modern machinery will increase the output.

Saguache County.

Reports from Creede are to the effect that a new market is likely to be soon opened up for the low grade ores of Creede, especially for the chloride ores of the Sunnyside district. The Walsh mill at Silverton wants chloride ores, and has sent to Mr. Richard Erwin of the Alpha mine for a car load. The mill is treating low grade ores by the Austin process, and claims to be able to return a profit to the miner from 20-oz. ore.

There has been some hitch in the arrangements looking toward running a tunnel to catch the New York vein in the Commodore lode, and in consequence it cannot be said when this work will be commenced. It was proposed to lease the Missing Link tunnel, which starts on the Missing Link ground, runs westward through the Senate No. 2, and is now 40 ft. in the New York, or a total distance of over 500 ft. Its operators found no mineral and quit work. The Commodore owners, among whom is A. E. Reynolds, offered the Missing Link owners \$1 a day for the use of the tunnel until they reached the New York vein. When that point was attained and they began to ship, the rental for the tunnel was to be \$125 per month, and when they got to shipping 6 cars a day they agreed to pay \$250 a month rent. The owners of the tunnel at first agreed, but last week the Missing Link people notified Mr. Reynolds that they would not accept the \$1 a day term, that the tunnel was worth more, and so all negotiations are off.

Nancy Hanks—Contractor Southey has completed his 100 ft. of sinking on the ore body on this property, and has a carload of good pay ore on the dump.

FLORIDA.
Clay County.

Black River Phosphate Company.—This company, mining near Middleburg, Fla., is again shipping phosphate, via Palatka and the Georgia Southern & Florida Railroad.

IDAHO.
Cassia County.

Last Chance Mining and Milling Company.—This company, which has its headquarters at Almo, has filed its articles of incorporation. Of the capital stock of \$200,000, \$175,000 is given as paid up. The incorporators are: Thomas P. Potts, of Woodlands, Utah; Edwin Dowden, of Salt Lake, Utah; James M. Durfee, John Potts and T. H. Potts, of Almo.

Custer County.

Idaho Copper Company.—W. A. Clark, the Montana mining man, has secured 51% of the stock of this company, whose property is located near Huston, on Lost River, Frank Brown controlling the remainder and continuing as superintendent of the property. A 40-ton smelter will be running as soon as possible and if the results are as anticipated a great plant will be put in. The company has given order for transportation of coke and is making every preparation for a run. This copper vein is 65 ft. wide and is known as the Big Copper. There is said to be enough good ore in sight to run a 40-ton smelter two years. A shaft is to be sunk on the vein at once to the depth of 300 ft. In addition a tunnel will be started on the other side of the hill following the vein in. This tunnel will be 3,000 ft. long and will open the vein at great depth. The ore carries from \$8 to \$10 in silver per ton and some gold.

Owyhee County.

De Lamar Mining Company, Limited.—The following is the return for the month of July: Crushed during the month, 3,715 tons; bullion produced in the mill, \$71,775; estimated value of shipping ore, \$5,500; miscellaneous revenue, \$820; total produce, \$78,095. The total expenses were \$34,500, leaving estimated profit for the month \$43,595. In Manager Plummer's detailed report for the month of June the most important note in the prospecting department relates to the Sommercamp group. During the past month a vein has been intersected, showing 2 ft. of ore, assaying at the point of intersection \$30 per ton. The cross-cut is in highly mineralized porphyry. The milling department was operated during June with great steadiness. Owing to the proximity of the national holiday and the usual clean up day, it was decided to make one stoppage only. On July 4th the mill was shut down; on the 5th it stopped eight hours, during which time a rapid clean-up was made. In consequence of the strike on the railroad, both bullion and amalgam have been stored, waiting for the railroad to open.

The table of work performed for June is as follows: Number of wet tons crushed, 3,997; dry tons crushed, 3,577. The assay value of the pulp was \$27.19, of which gold was \$22.59, and silver (at 60c.) \$4.60. The assay value of the tailings was \$179. gold being \$1.17 and silver \$0.62. The pure gold produced was 2,652.394 oz., and the fine silver produced 26,334.18 oz. The value of gold produced was \$53,048; of the silver produced, \$15,900. The ore shipped during the month was \$7,708; the bullion differences \$1,552, and the miscellaneous revenue \$737, making a total of \$78,846. The expenses for the month were \$36,790, leaving an estimated profit for the month of \$42,056. The Pelton wheel has worked continuously during the month, with the exception of one break in the ditch, of short duration, on June 2d. On the Louise Creek ditch the fluming has been resumed, and the work keeps pace with the delivery of the lumber. Everything about the premises is in good order, and each department moves satisfactorily.

The following notes are from the Silver City "Avalanche" of recent date:

Buckhorn.—Al Sotheren is at work with a force of men developing his Buckhorn claim, one of a series on the same ledge at Meadow Creek. This property lies above and is reasonably supposed to be the source of the Meadow Creek placers owned by Dave Johnson.

Home.—Messrs. St. Clare & Lewis are stopping out their ore opened during the winter in running their tunnel, and have a nice lot of ore on the dump. The value is mostly gold.

Lost Mine.—Messrs. Richard Benham and John Price have prospected the Quicksilver Mountain country for several years past. It is said that in the early history of this camp a prospector had brought some rich gold quartz from that locality on several occasions, but died without divulging the whereabouts of his find. Messrs. Benham & Price think they are on the same ground, and have christened their property the "Lost Mine." They have done any amount of work in the form of open cuts, etc., trying to discover the source of the rich float to be found in that neighborhood, and are now sinking on the ledge. The extent of their ore body is not yet ascertained. The property is about 10 miles from Silver City.

Star.—Messrs. Stoddard & Drake, who have been working the Star on a lease, are milling their winter's output at the Wagner arrastra.

Tip Top.—This is the Florida mountain property, owned by Messrs. Gearhart & Feour, in which the rich strike was reported about a month ago. Ore hauling has commenced to the Lincoln mill, which has recently been fitted up for starting. The owners sunk a shaft on the vein to a depth of 30 ft. and are now drifting south. Their ledge is very large, the pay being 15 ft. in width, and the value is nearly all in gold. In the Mountain Boy, which lies just east of the Tip Top, and owned by the same parties, they have recently put in a car and track and will push development work. A survey of this property was made with a view to make connections with an old shaft for air. A 30-ft. upraise will only be necessary to secure perfect ventilation.

Shoshone County.

Last week, says the Wallace "Miner," it was understood that a compromise had been effected by which the Gem, Frisco and Standard mines were to commence operations at once, provided that the railroads commenced and continued in service. The principal features of the agreement, as far as can be learned, are that the Union shall in no way interfere with the management of the mine, which shall be free to hire and discharge whomsoever it pleases, and the executive committee of the Miners' Union agrees, also that they will preserve peace and harmony as far as lies in their power. There is no change whatever in wages. Under this agreement the mines are already resuming work as fast as matters can be got in shape for work. Some men were put on Monday night at the Gem, and the number is being gradually increased. The Tiger continues on one shift as usual.

Washington County.

North Star.—July 30th, says the Boise City "Statesman," the Merritts took possession of this mine on Rapid River. Thus is consummated one of the most important mining deals in Idaho. It also inaugurates a new era for the Seven Devils country and will give it an air of activity it has never known before. It is not copper this time, for there is not a trace to be found on Gold Hill, but free milling gold quartz. The price is, as first reported, \$60,000. The terms are \$3,000 down and the remainder in 90 days. There is now exposed in the face of the tunnel more than 3 ft. of decomposed quartz. The tunnel is now in 25 ft. and in ore all the way. The ledge is standing nearly perpendicularly in the face of the tunnel, but the dip of the formation is to the east. There has been no means at the mine of estimating the value of the quartz taken out except by the mortar and pan.

ILLINOIS.

The coal operators in the Springfield district have announced that they cannot pay the scale recently agreed upon and compete with the Pana operators, who only pay 20 cents a gross ton, while they are compelled to pay 45 cents. A mass-meeting of the miners of the district will be held shortly to take action on the situation.

INDIAN TERRITORY.

Choctaw Coal & Railway Company.—The time for depositing stock under this company's reorganization plan expired on August 11th. It is known that of the 75,000 shares all except a few blocks in the hands of stockholders who are out of the city have been deposited. A syndicate has been formed to underwrite the unassented stock. It is announced that the property will be sold September 8th under foreclosure; this action will be taken so as to come under the new charter. Both houses of Congress have passed a bill making the company a United States corporation, confirming its rights in the reorganization. There was a question whether, under the United States statute, the company, if foreclosed, could keep its present rights; the act of Congress is, therefore, an enabling act. The chief office of the company, heretofore in St. Paul, Minn., will now be located in Philadelphia, Pa.

MICHIGAN.

Copper.

The following reports of mining companies for the year ending June 30th have been filed:

Atlantic Mining Company: Cash paid on capital stock, \$280,000; by conveyance of property, \$706,000; invested in real estate, \$710,402; personal estate, \$292,533; floating debt, \$41,897; due corporation, \$100,000; copper obtained, 2,011 tons (2,000 lbs. to the ton). The list of shareholders contains 374 names. The largest shareholders are John Stanton 1,150, and Washington Pitt 1,000.

Kearsarge Mining Company: Cash paid on capital stock, \$190,000; by conveyance of property, \$460,000; real estate, \$474,000; personal estate, \$173,307; floating debt, \$23,286; copper obtained, 814 tons 1,870 lbs. There are 492 names on the list of shareholders.

Osceola Mining Company: Cash capital paid in: \$480,000; by conveyance of property, \$770,000; invested in real estate, \$578,297; personal estate, \$353,281; floating debt, \$86,101. Copper obtained, 3,357 tons 1,870 lbs. The list of shareholders contains 676 names.

Tamarack Mining Company shows: Cash paid on capital stock, \$320,000; by conveyance of property, \$330,000; invested in real estate, \$200,000; floating debt, \$205,053; copper obtained, 7,713 tons 1,757 lbs. The number of shareholders is 1,134.

Tamarack Junior: Cash paid in, \$649,000; by conveyance of property, \$360,000; invested in real estate, \$360,000; personal estate, \$26,937; floating debt, \$113,967; copper obtained during 1893, 8,042 to 8 1,109 lbs. The number of shareholders on the list is 539.

Wolverine Copper Mining Company shows: Cash paid in on capital stock, \$201,75; by conveyance of property, \$550,000; personal estate, \$34,081; unsecured or floating debt, \$22,968; due corporation, \$7,925; gross tons of copper obtained during 1893, 457 tons 1,382 lbs (2,240 lbs. to ton). The list of shareholders shows 176 names.

Calumet & Hecla Mining Company.—This company has received 30,807 tons of coal up to date since the opening of navigation. The company will place over 100,000 tons more in its sheds if it can secure transportation.

Calumet & Hecla Mining Company.—At the annual meeting, held in Boston, August 15th, Vice-President Livermore presided. There were 73,684 shares represented out of a total of 100,000 shares. After the reading of reports Alexander Agassiz, Irving A. Shaw, Francis L. Higginson, F. W. Hunnewell, of Boston, and James N. Wright, of Michigan, were re-elected directors. The stockholders authorized the sale of 600 acres of timber land outside the mineral belt owned by the Calumet & Hecla Company to the Atlantic Mining Company. It is now used by the Atlantic company for railroad purposes.

Iron—Gogebic Range.

Aurora Iron Mining Company.—Charles F. Rand was elected president and treasurer of this company at the recent meeting in New York. Charles L. Colby, the former president, is absent in Europe. Joseph L. Colby, second vice-president, has also resigned, to give his entire attention to mining interests in the State of Washington. The Board of Directors of the company is as follows: F. T. Gates, Charles F. Rand, Edwin H. Abbot, Charles L. Colby, Joseph L. Colby, L. H. Severance and W. J. Olcott.

Iron—Marquette Range.

Blue Mine.—They are developing this property by the addition of another level. They have made but few sales, the larger portion of the stock being unsold.

Cleveland-Cliff Iron Company.—This company is taking out the old machinery at the Cleveland Hematite mine and replacing it with the plant formerly in use at the company's No. 1 hard ore mine. As soon as the plant is removed it will be sent to Milwaukee, where it will be thoroughly overhauled, after which it will be set up at the Lake Shaft mine for use in operating the electric haulage tram cars.

Lake Superior Iron Company.—This company's statement for the year ending April 30th shows that it has a capital stock of \$2,500,000. During the year its gross receipts were \$1,210,574; its total expenses, \$938,162; its net profits, after charging off \$128,942 to offset reduction in the value of vessels, cost of repairs, and \$25,000 for the purchase of some mining rights, were \$120,470. The ore statement for the year is as follows: In stock at mines, May 1st, 1893, 291,426 gross tons; mined during the year, 275,733 tons; shipped from mine, 329,610 tons; delivered to customers, 34,424 tons; in stock at mine, April 30th, 1894, 240,552 tons. The company paid a dividend of \$1 per share January 10th, and another of the same amount April 16th.

Negaunee.—At this mine they are raising about 10,000 tons of ore per month. The mine is looking well, and the ore is of excellent quality.

Iron—Menominee Range.

Columbian.—In this mine at Crystal Falls, the bailers are busy at work getting out the water at the rate of about 1,000 gallons per minute. The workings are about 300 ft. deep, and the water has been lowered fully 150 ft. A small force is at work

in the open pit on a slope of ore left behind in former operations.

MINNESOTA.

Iron—Mesabi Range.

(From our Special Correspondent.)

Biwabik Ore Company.—This company is settling up its old labor claims. Affairs are being rushed at the mine and it is expected that shipping from the east cut—the new one—will be under way this week and from the west cut in about two weeks. All the ore mined last season came from the west cut, and 120,000 tons were mined from September to the close of the season. Over 370 men are at work at the mine. At the east cut the ore is exposed a distance of 470 ft., and a width of about 60 ft., and a shovel is making a cutting in this ore for a track.

Hale.—Shipments from this property have been delayed by the work of getting the machinery into shape, and several experiments had to be made. It will be shipping next week, and much interest is evinced by mining men in the new style machinery to be used.

Iron—Vermilion Range.

(From our Special Correspondent.)

Shipments from Tower are averaging about 300 cars per day, and will probably be large for the rest of the season.

Minnesota Iron Company.—This company is exploring and opening a property on its line between Tower and Ely, from which it expects to do shipping next year.

MONTANA.

Jefferson County.

Elkhorn Mining Company, Limited.—The following is the return for the month of July: Mill worked 27 days and crushed 1,050 tons; bullion produced in the mill, \$22,600; 162 tons of smelting ore sold, \$11,700; total produce, \$34,300. The total expenses were \$21,146, leaving estimated profit for the month \$14,154.

Lewis & Clarke County.

Montana Gold Mining and Development Company.—Erastus D. Edgerton, Alexander J. Steele and John B. Clayberg have organized this company with a capital stock of \$6,000,000, divided into shares of \$100 each. The company is incorporated for the usual period of 40 years. The trustees for the first three months are E. D. Edgerton, Alexander J. Steele, Preston H. Leslie and John B. Clayberg of Helena; Geo. B. Hoyt and Dion Geraldine of Chicago; and Pinkney F. Barr, of St. Paul. The principal office of the company is to be at Helena, with a branch office in Chicago. The object of the new organization is to conduct a general mining business in Montana.

Silver Bow County.

Black Sheep.—This quartz mining claim, says the Butte "Inter Mountain," is the center of an extensive group, the adjoining claims being the Shamrock on the east and the Santa Cruz on the west. Fifteen months ago a tunnel was started from the eastern end of the Black Sheep and run a distance of 60 ft. in a southwesterly direction, where a stringer was encountered. This stringer was followed westerly 380 ft. From this point a cross-cut was run southerly 100 ft., where a ledge of gold-bearing rock was discovered. This ledge is over 2 ft. in width. At this point the vein, estimated from actual survey, is 225 ft. in depth on the incline from the surface. As the tunnel is driven into the mountain the vein increases in width and improves in value. Weinberger Klaffki et al., the parties who held the lease and bond on these properties, tapped this ledge and drifted about 70 ft. westerly. About 40 ft. north of this gold-bearing find lies another vein of gold and silver-bearing quartz. The latter ledge has never been touched from the tunnel, but is opened by a shaft 80 ft. in depth. This is the group of mines on which the lease and bond held by Weinberger, Klaffki et al., recently expired. The parties wished to renew the lease, but the owners refused.

The following notes are from the Butte "Inter-Mountain" of recent date: Another quiet week has passed in the mining industry of the district. The resumption of work at the Parrot mine and smelter gave employment to some 350 men who were laid off during the strike. The Anaconda properties resumed Monday after a two days' shut-down and the customary amount of ore is now being mined. At all of the other copper properties the usual activity exists and promises to continue for a long time to come.

At the High Ore No. 2 sinking is still progressing and the 500-ft. mark is almost within reach. The new engine has been placed in position and operations are conducted more rapidly than of yore.

About 260 men are employed at the St. Lawrence mine at present.

Sinking is still in progress at the Sunnyside, about 12 men in all being employed. The shaft is being developed from the 370 to the 500-ft. level and has now reached a depth of 500 ft. This property is under lease to Breen, Fozarty & Co.

The Olin is being operated by McNerny & Co., who have a lease and bond on the property, and are sinking a new shaft near the Parrot hoist. The shaft has now attained a depth of 110 ft., and work will be continued to the 200-ft. level. Two men are employed on a shift and manage to sink about 1½ ft. per day.

Emil & Joe, of Butte, who had a lease on the Black Sheep mine in Beefstraight Gulch, have discontinued work after sinking nearly \$11,000 good money in endeavoring to make a mine out of it. A tunnel 580 ft. in length was run to tap the lead which was supposed to exist there, but all efforts to do so were futile. It is said, however, that there are a number of good properties carrying gold in that district.

Camp Creek.—Messrs. Clark & Bennett, who formerly held a lease on the Goldsmith No. 2, recently secured a lease and bond on a copper property midway between Camp Creek and Soap Gulch and are now actively developing it. The property is known as the copper lode, and is owned by Robbins & Travnor, of Melrose. They have now developed the shaft to a depth of 50 ft., and are said to have a solid vein, 2 ft. in width, of ore which will average 30% copper. Sinking is progressing rapidly, the necessary machinery having been secured for that purpose, and will be continued until the 200-ft. level is reached. At this depth it will be the deepest shaft in that locality and it will probably demonstrate if that mining district is as rich as prospectors claim it to be. The next deepest shaft there is on the Maggie, which was developed to a depth of 176 ft. by the Butte & Boston Company, but was abandoned, owing to the depression, and has since caved in and become useless.

NEVADA.

Storey County—Comstock Lode.

Crown Point Mining Company.—The latest weekly official letter says: Work was resumed in the mine on August 5th and the extraction and shipment of ore to the mill commenced August 9th. We have started two crosscuts on the 500 level, from the south drift, 80 ft. from the face—one east and the other west, opposite each other. Both are in a mixture of clay and porphyry.

Savage Mining Company.—The superintendent's latest weekly official letter says: During the week we have hoisted 29 cars of ore. Car samples average \$2.41 per ton. Shipped to the United States Mint at Carson, on the 2d and 4th, 515 lbs. of crude bullion, being the clean up of 86½ tons of ore milled at the Nevada mill. The gross bullion yield of the same was \$11,970; discount, \$4,618; net coin value, \$7,352. On the 1,000 level the north lateral drift from the face of the east drift is advanced 20 ft. We are putting in square sets and stoping ore from the face of this drift. The south lateral drift started from the same point, opposite the north drift, is advanced 17 ft.; face in quartz giving low assays. On the 1,050 level the west crosscut from the sixth floor of the south ore stones was advanced to a total length of 70 ft.; face in low-grade quartz. On the 4th and 10th floors of these ore stones we have started two east prospecting drifts, which are advanced respectively 6 and 10 ft. These drifts are in porphyry and quartz, giving low assays. On the 1,100 level the north lateral drift from the station was advanced to a total length of 263 ft.; face in quartz and porphyry.

Superintendent Gorham writes that the assay value of the product from 1,288 tons and 1,390 lbs. of Crown Point "gold" rock worked at the Mexican mill in July was \$10,649, of which \$10,178 was gold and \$447 was silver. Work has been resumed in the mine, and 80 tons of this character of ore, or a total of 560 tons per week, are now being regularly extracted.

NEW MEXICO.

Sierra County.

Kingston Division.—Ore shipments have again resumed; the Caledonia, Cumberland and probably one or two other mines are shipping, says the Silver City "Sentinel." Some are holding back on account of the present price of silver, notably Hartman and Foran, of the New Strike mine. Others are taking advantage of the lull and are putting their mines in shape for more economical working.

NORTH CAROLINA.

Cabarrus County.

(From our Special Correspondent.)

Rocky River Gold Mine.—This mine is being watered by Wayne Darlington and associates. If it turns out as represented it will be purchased by them and operated on a large scale.

Montgomery County.

The New Gold Hill Company, Limited.—At a meeting held in London this company decided to accept an offer made by John H. Todd to erect a chlorination plant at the works without expense to the company. If successful the company will transfer to Mr. Todd 49,000 shares out of a total of 100,500, giving him a half interest. In order to do this the present company will promote a subsidiary company of £100,000 capital, which would take over the mine, mining rights, machinery and other property, issuing to Mr. Todd 49,000 shares when he has made a profit of £2,000 available for dividends. Until this is accomplished Mr. Todd provides all of the working capital.

(From our Special Correspondent.)

Developments are in progress at the Granmam and Saunders gold mines, with encouraging results at the first-named.

Randolph County.

(From our Special Correspondent.)

A small mill is being erected for working a gold prospect near New Hope Academy by James Shears, a practical miner.

Rowan County.

(From our Special Correspondent.)

Reimer Gold Mine.—This mine, situated some six miles from Salisbury, has again resumed operations under the careful management of John Jacobs, a Philadelphia mining engineer. Mr. Jacobs was formerly manager of the Yarkin Chlorination Works at Salisbury, during which he treated hundreds of tons of Reimer mine sulphurets; consequently he is well up on the ore he has to contend with. It is reported that the reserves in the mine can show 24,000 tons of sulphuretted ore, valued at \$8 per ton. At present they are unwatering the mine to the 250-ft. level and erecting a stamp-mill.

OHIO.

Stark County.

At West Broomfield some striking miners have organized a co-operative coal company and leased the Keller mine, abandoned as worked out two years ago. The lessees were employed in this mine some years ago, and think they can discover new workings with little expense.

OREGON.

Baker County.

Arizona Mine.—The Baker City "Democrat" says that on the Baker side of the Powder River, about four miles east of North Powder, Matt Gutrie has recently bonded a ledge of free milling gold ore for \$10,000, with \$1,000 down as a bonus. The mine is known as the Arizona, and the bonding was done by a Chicago firm. A 10-stamp mill is to be erected on the property at once, and according to the specifications of the contract, Mr. Gutrie is to receive 50% of the proceeds the first six months.

Eureka Excelsior Mine.—Operations at this mine are to be resumed under the direction of Mr. John Longmaid, of Salt Lake City. The 20-stamp mill is being put in order and a chlorination plant is to be put up.

Marion County.

Baisley Elkhorn.—The litigation over this mine has been settled and work will be resumed at once, under charge of Mr. John R. Farwell. A chlorination plant is to be put up.

Union County.

The copper mines near North Powder owned by Salt Lake capitalists and superintended by Mr. Clark, are being developed. A force of 12 miners is employed. A furnace is being erected and a reduction of the ores will be made shortly. About 100 lots are ready at this time for the smelter.

PENNSYLVANIA.

Bituminous Coal.

About 2,000 striking miners of the Pittsburgh District held a meeting on August 13th. These men are sticking out for the 60c. rate and are not disposed to accept the 55c. In this district 136 mines out of 144 are paying the price agreed upon at the Columbus convention. The miners at the other 12 mines are striking. The men who met on August 13th are from the three mines of the New York & Cleveland Gas Coal Company, Spring Hill mines of the Boyd company, and the Muchlerat mines, near Wilkinsburg. This meeting was called together to decide whether to accept the propositions of the companies or to continue to strike. The New York & Cleveland Gas Coal Company offered 55c. Some of the other companies were offering 60c., but refused to go higher. Letters were read from the managers of these different coal companies. The men discussed them and then a resolution was offered that the strikers get the 60c. or not return to work. These men have been on a strike since April 21st. The working miners throughout the district have been assessed 25c. a week to enable these diggers to continue the strike. The men at the meeting were all Americans. The New York & Cleveland Company is the largest one involved and it is gradually replacing the strikers by foreigners. The management say they will not pay the 60c. rate.

OIL.

A press dispatch from Greensboro states that considerable excitement prevails in that end of Greene county over a big oil strike made in Dunkard township. The well is on the McClure farm and is situated at Barker's Ford, on Dunkard creek. The strike was made in the Big Injun sand. The location is east of what is commonly regarded as the oil belt, about seven miles from the Monongahela river, and great activity now marks the efforts to secure leases in the adjacent territory. The well is doing nearly 200 barrels a day.

SOUTH DAKOTA.

Pennington County.

Black Hills Mining and Smelting Company.—The First National Bank of Rapid City has received a sheriff's deed to this company's property. The bank foreclosed a mortgage on it over a year ago. It is estimated, says the Rapid City "Journal," that fully \$80,000 in claims for wages and material has been filed with the receiver. Now that the property is in the hands of the bank it is thought that at an early date a competent man will be placed in charge and the works started up. It will furnish employment for 80 men.

UTAH.

Salt Lake City.

The receipts of ore and bullion in Salt Lake City for the week ending August 9th were to the aggreg-

gate value of \$53,627, of which \$50,331 was in ore and \$23,236 in bullion.

Salt Lake Copper Manufacturing Company.—The initial shipment of copper ingots from the company's works has been delayed on account of some necessary adjustments in the reverberatory furnace.

Tooele County.

Mercur Mining and Milling Company.—This company has at last decided on the erection of a new mill, using the cyanide process, of 200 tons daily capacity.

WASHINGTON.

Lincoln County.

J. S. France, A. S. France, Wm. France, Wm. Lingenslar, J. B. and A. L. Tensley, and J. C. Margo, all of Harrington, have been putting in some good work developing their mining interests on Hunter creek.

Snohomish County.

Goat Lake Mining Camp.—This camp, says the Monte Cristo "Mountaineer," is situated on Goat Lake at the head of Elliott Creek, and about 1 1/2 miles due east from Monte Cristo.

WYOMING.

Albany County.

Keystone Mill.—The reported sale of this property to Mr. Osborne, of Park City, Utah, has fallen through. The property is still owned by Barclay & Young.

FOREIGN MINING NEWS.

BELGIUM.

For the half year ending June 30th the imports of fuel were: Coal, 656,000 tons; coke, 156,000 tons. This is a decrease of 1 1/4% coal, but an increase of 3 1/2% in coke.

The imports of iron steel show a small increase. They were this year 9,000 tons of steel billets; 5,500 tons finished steel; 120,000 tons pig and cast iron; 13,000 tons old iron and scrap; 929,000 tons iron ore.

BRITISH COLUMBIA.

Kamloops District.

(From our Special Correspondent.)

The Botoanie Creek Hydraulic Mining Company have shut down their works. It is not known when they will open up again. Work on the property of the Tranquille Hydraulic Mining Company is being pushed rapidly.

Lytton, Fraser River.

(From our Special Correspondent.)

President C. C. Crockett, of the Fraser River Dredging Company, has started work building a scow to be used in dredging the company's bar near Lytton.

Nelson District.

(From our Special Correspondent.)

Sundown Claim.—Five-sixths interest on this property has been bonded by George H. Colwell to C. N. Park for \$15,000. The claim is situated about three miles south of Nelson and about 1 1/2 miles east of the old Hall mine trail.

and has a pay streak of 10 in. The ore is quartz, containing iron and copper pyrites; assays from \$4 to \$90 gold. It is claimed part of the ore is free milling.

Slocan District.

(From our Special Correspondent.)

Considerable excitement has been caused in New Denver and Nakusp by the report of rich placer ground on Caribou Creek, and quite a number of men went to the new camp. It is situated south of Nakusp and almost due west of New Denver.

Eureka Claim.—William Moore and McDonald Bros. have just completed a tunnel 185 ft. long in this claim, and have struck a vein of galena 2 ft. in diameter.

Idaho Claim.—A new strike is reported from this mine similar to that found on the Alpha about a year ago. This strike on the Alpha, mentioned here, was on the surface, and showed an 11-ft. vein of high grade ore.

Vancouver Island.

(From our Special Correspondent.)

A find of rich placer digging is reported from Hiawatchee Creek in the China Creek district. The King Solomon mine, owned in Victoria by Messrs. Quilan & Co., is snowing up well.

A company is now being organized in Victoria to work the Daisy claim, near Esquimaux. This claim was found some time ago. It is situated on the north side of Esquimaux harbor, close to the water's edge.

FRANCE.

For the six months ending June 30th the imports of coke were 742,580 tons, an increase of 52,672 tons, or 7 1/2%, over the first half of 1893.

Imports of iron ore for the half year were 788,736 tons, an increase of 64,934 tons, or 9%, over 1893. Imports of pig iron this year were 30,600 tons; of ferro-manganese 2,388 tons. On the other hand 55,862 tons of pig iron were exported.

Imports of finished iron were 9,771 tons and of finished steel 2,927 tons. The exports of finished or manufactured iron were 10,589 tons and of steel 6,556 tons. Both imports and exports showed a slight increase this year.

In addition to the above there were "temporary imports" of iron and steel amounting to 31,366 tons for the half year, and corresponding re-exports of 30,347 tons.

GERMANY.

The pig iron output of the German furnaces in June, according to "Stahl und Eisen," was 471,922 metric tons, an increase of 61,449 tons, or 15%, over June, 1893. Of the production this year 127,430 tons are classed as forge iron, 75,970 tons foundry iron; 54,049 tons Bessemer pig, and 214,473 tons Thomas pig.

MEXICO.

A dispatch from the city of Mexico, says that President Diaz has received official notice of the completion of the Tehuantepec Isthmus Railway and the formal opening of the line for operation. It has not been received from the contractors yet, as an inspection of the line must be made.

RUSSIA.

Poland.

The great coal mines near Dombrowa, government of Gradno, have been burning since August 11th. The fire started by an explosion of gas while the full force of men were underground. The main shaft was wrecked, and comparatively few miners have been rescued.

LATE NEWS.

The Homestake Mining Company, of South Dakota, makes its dividend for July 20c. per share, instead of the 15c. it has been paying monthly, showing an increase of 33 1/3% in the rate.

An account of the opening of the meetings of the American Association for the Advancement of Science and its allied societies will be found in another column. On Thursday the general meeting of the society began at the Polytechnic Institute in Brooklyn, Dr. William Harkness presiding.

In the other sections the programs included a paper by Henry Farquhar, of Washington, upon "A Stable Monetary Standard," before the Section of Economic Science and Statistics.

In the evening the retiring president, Dr. William Harkness, delivered the annual address upon "The Magnitude of the Solar System."

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Aug. 17.

Statement of shipments of anthracite coal (approximated) for week ending August 11th, 1894, compared with the corresponding period last year:

Table with columns: Regions, Aug. 11, 1894, Aug. 12, 1893, Difference. Rows include Wyoming, Lehigh, Schuylkill, and Totals.

Table with columns: Shipped East and North, Week, Year, 1894, 1893. Rows include Philadelphia & Erie R.R., Cumberland, Md., Barclay, Pa., Broad Top, Pa., Clearfield, Pa., Allegheny, Pa., Beech Creek, Pa., Pocahontas Flat Top, Kanawha, W. Va., and Totals.

The production of coke on the line of the Pennsylvania Railroad in tons of 2,000 lbs., for the week ending August 4th was 71,377 tons; year to August 4th, 1,621,913 tons; 1893 to corresponding date, 3,071,089 tons.

Anthracite.

So far as prices and volume of business are concerned, the anthracite coal market is still in the unsatisfactory condition which we have been reporting for a month past. There is still the same lack of firmness in the first and the same small demand in the latter.

As to the volume of business, no improvement is to be expected until the present restriction has had time to make itself felt. This is beginning now to show itself in some quarters, though not enough to make much change in the general situation.

tinued on the present basis of production, 2,500,000 tons for August. For the first eleven days of the month the production has been but slightly over 800,000 tons, which shows that the operators will keep within the restricted output during the balance, if they will only work on the basis of the past fortnight. It was found that owing to a misunderstanding of some kind the Lehigh Valley had exceeded its allotment somewhat, but the company will work less during the second half of the month, so that in the end it will have mined its proportionate share and no more.

The daily press has contained considerable misinformation during the past week in reference to the allotment question, it having been reported that the Reading's share had been cut down to an even 21%. A committee was appointed some time ago to investigate the capacity of the different companies and to determine and recommend whatever changes were deemed advisable. This committee consists of Messrs. Henderon, of the Philadelphia & Reading; Sayre, of the Lehigh Valley Coal Company; Torrey, of the Delaware & Hudson Canal Company; E. B. Ely, of Coxie Bros. & Co., and Watkins, of Simpson & Watkins, representing the individual operators. This committee has not yet made any report nor has any new agreement been made by the operators. The impression is current that the Reading, which has always been known to be desirous of getting a greater allotment, will really have less, if any thing, when the new schedule is arranged—whenever that may be.

The Reading Railroad reports that its coal shipment (estimated) for last week ending August 11th, was 220,000 tons, of which 36,000 tons were sent to Port Richmond, and 14,000 tons were sent to New York waters.

NOTES OF THE WEEK.

The Bureau of Anthracite Coal Statistics makes the following statement of shipments of anthracite coal for the month of July, and seven months ending July 31st, compiled from the returns furnished by the mine operators:

	July		Seven Months	
	1893.	1894.	1893.	1894.
Wyoming region..	1,834,930	2,171,721	13,723,582	12,765,285
Lehigh region....	242,847	648,150	3,864,639	3,650,517
Schuykill region..	878,126	1,038,345	6,714,905	6,603,751
Total	3,275,833	3,838,216	24,298,717	23,019,553

The increase for the month was 592,352 tons, or 18%; the decrease for the year was 1,279,164 tons, or 4%. The greater part of this decrease was in the shipments from the Wyoming region.

The stock of coal on hand at tidewater shipping points, July 31st, 1894, was 855,078 tons; on June 30th, 1894, it was 745,162 tons; increase, 109,916 tons, or 15% during the month.

Bituminous.

There is but little that is new to report of the soft coal market. The heavy demand for coal which we have been reporting has eased up somewhat, due probably to the resumption of operations by the Clearfield and Beech Creek regions, which we reported last week. There are still, however, plenty of orders to go around and to spare. All the consumers have had their most urgent wants attended to, and are now buying for daily requirements, and are also laying in a small supply ahead. There is still some pressure for prompt shipments. This demand comes from all territories generally, but principally from the far east in the New England states, least of all, is the demand from points about the shipping ports.

Prices remain firm at the regular figures of the various operators, but advances are no longer asked for future or for fairly prompt delivery, showing that the first demand for coal is over. The operators have on hand a large supply of orders and daily receive some, and the shippers' books show that they have all they can attend to. The larger contracts are now receiving more attention and are beginning to receive the first portion of their usual stock on hand.

The transportation of coal from the mines is excellent. There are no signs of a blockade. If the coal were not demanded promptly it would soon cause considerable trouble in that direction. There is not even any side-tracking of coal. The car supply is all that could be desired to tidewater points. Northern New York is embroiled by some railroads on account of the delay in unloading and returning the cars.

All-rail travel is good and prices are firm and high. There is a fair supply of vessels at all ports, but the demand is chiefly for orders around the Cape and as near the ice ports as possible for the sake of return cargoes of ice. We quote ocean freight rates as follows from Philadelphia: To Boston, Salem and Portland, 65c.; Providence, New Bedford, New Haven and Bridgeport, 70c.; Bath and Bangor, 65@70c.; Gardner, 65@70c. and towages; Wareham, 80@90c.; Lynn, 70@80c.; Newburyport, 75c.; Dover, 85c. and towages; Saco, 75c. and towages.

NOTES OF THE WEEK.

Public announcement was made on August 13th that the Altoona & Phillipsburg Connecting Railroad would be opened for freight and passenger traffic as far as Houtzdale on August 15th. This road will give a large soft coal tonnage to the Reading and Beech Creek railroads. Sixteen trains will be run between Phillipsburg and Houtzdale.

The United States monitor Monterey sailed from Mare Island Navy Yard, San Francisco, Cal., on

August 13th, for Astoria, Ore., whence she will go to Puget Sound to make a practical test in her furnaces of coal from several Washington mines. Until very recently all of the coal burned by the Pacific Squadron has been purchased by the Navy Department from British Columbia mines, though strong protests have repeatedly been made by the commercial organizations of several Puget Sound cities.

The Davis Coke and Coal Company, of West Virginia, has for some time past been in active correspondence with the Navy Department with a view to induce a trial of coke on board of one of Uncle Sam's warships as a smokeless fuel. It is stated that the effort has been successful, and that the United States steamship "Dolphin" has now in her bunkers some 50 tons of specially prepared coke from the Davis company, which will be used on the trip and thoroughly tested. In April last the steam yacht "Conner" tried the new fuel, and the experiment is said to have been successful.

Buffalo. August 16.

(From our Special Correspondent)

The present condition of the coal trade of this port is one of dullness or apathy. Buyers of anthracite hold off and consumers of bituminous purchase only in small lots. There are no indications of any advance in the quotations ruling, therefore there is no inducement to do business for future use. Stocks of anthracite at the tresles are ample, and from personal knowledge the railroad sidings have hundreds of loaded cars of bituminous on them.

The lake freight situation remains without change and few signs of improvement.

Advices from Duluth of the 14th instant say: "There is a big coal fleet here. Some of the boats have waited three days for their turn to discharge cargoes. Many boats are on the way up, which will cause a blockade."

The shipments of coal westward by lake from Buffalo from August 5th to 11th both days inclusive aggregated 61,190 net tons, distributed as follows: 28,550 tons to Chicago, 15,150 tons to Milwaukee, 4,700 tons to Duluth, 2,000 tons to Superior, 4,365 tons to Toledo, 1,900 tons to Racine, 550 tons to Alpena, 1,275 tons to Bay City, 800 tons to Gladstone, 650 tons to Muskegon, and 850 tons to Green Bay and 50 tons to Saginaw. The rates of freight were as follows: 55c. to Racine and Cheboygan; 60c. to Muskegon; 50c. to Chicago, Milwaukee and Green Bay; 40c. to Algoma; 30c. to Duluth, Superior and Gladstone; 35c. to Alpena and Saginaw; and 25c. to Toledo and Bay City. Closing quiet and firm.

From the opening of navigation to August 1st, 1894, only 532,677 net tons of coal passed through the Sault Ste. Marie Canal; in 1893, 1,501,210 net tons; in 1892, 1,557,791 net tons.

The receipts of coal at Superior and Duluth from May 29th to July 31st this year were 2,890 net tons; of this quantity 158,400 tons were hard and 72,500 tons soft.

The Canadian Government has commenced dredging a channel 20 ft. deep and 400 ft. wide at Port William.

Again the Eddy has broken all records. On her last trip from Buffalo she carried 4,270 net tons of hard coal besides her fuel of 230 tons. Time of loading the coal only 3 1/2 hours.

The Buffalo Furnace Company, after many months' idleness, will resume operations in about ten days. The absence of a supply of coke through the strike was the cause of the shutdown.

A saloon keeper was arrested yesterday for stealing coal from the railroads; about five tons was found in his possession, which he had secured in wheelbarrows at a time.

A project for establishing a marine exchange at this port is under advisement. The idea is to erect an eight-story building, with ample office room for all lake line companies, tugmen, vessel agents, brokers and others, thereby consolidating the business into one focus, as it were.

Chicago. August 16.

(From our Special Correspondent.)

Anthracite.—If last week was dull in the hard coal market, the week just closing has shown up even worse. The aggregate tonnage for the week is much below that of the previous week. It appears that everybody bought hard coal with a rush after the strike and now business is confined almost wholly to consumers who are actually in want of coal, who did not take part in the scramble to buy just after the strike. These people are now benefiting by their holding off, as coal can be bought almost at their own price. The quantity of hard coal now in the city is large and the supply is being greatly augmented by lake and rail shipments daily. The circular price for hard coal is \$5.25, but offers for 25c. less are not being refused.

Bituminous Coal.—Like hard coal bituminous is suffering from an over supply, and the market has assumed a demoralized condition. From a good market two weeks ago trade has dropped to almost nothing, and dealers are again troubled with a severe attack of the blues. For the limited trade now going competition is so great that nearly ridiculous figures are being named to catch the business. For the past two weeks soft coal has dropped in price from 30 to 50c. per ton, and it may be more should not business take a turn for the better. The railroads continue to be all at sea in regard to coal shipments, and shippers are consequently meeting with a deal of trouble in finding their coal. Spring Valley, Ill., coal district is about the only place where

the miners have not gone back to work, and it is said that they will hold out until a scale is adopted that will be thoroughly satisfactory to them. Eight bids for coal for the city electric light plant and electrical department were rejected by the controller Tuesday. The bids were received prior to the reduction in freight rates from the Brazil, Ind., coalfields and were in every case accordingly too high. New bids will soon be called for. It may be that crude oil will take the place of soft coal as fuel on the Chicago River tugboats. Experiments during the past week have resulted favorably. The tug "Black Ball" has for ten days past used simply the oil fuel with the following results: Of the ten days four of them were devoted to experimental work and six to actual towing. The total fuel bill amounted to \$72, an average of \$7 per day. In the four days that the tug did not towing the fuel bill amounted to \$18, in all 22 bbls. of oil having been consumed; thus the cost of fuel for the six working days was \$54, a daily average of \$9. This cost can after a period be reduced to about \$8 per day, the men being unaccustomed yet to its uses. The cost of soft coal for the same work is estimated at \$12 daily, which naturally gives the oil fuel an advantage.

Pittsburg. Aug. 16.

(From our Special Correspondent.)

Coal.—The Allegheny, Monongahela and Ohio rivers are down to a very low stage; this has been the means of suspending operations at certain points. The day hands at the Beaumont mines have been notified of a reduction of 25c per day to meet the cut of the Knob Coal Company; at the latter mines the men refused to accept the reduction and are on strike. At Beaumont the men decided to accept, and are at work, which has been scarce, it being impossible to obtain empties. Shipments of coal have been increased in the pool. The tow-boat Twilight took to Pittsburg 60,000 bushels; other large tows of from six to eight barges are lying at various points waiting for water. The climax mines, below Albany, started on Monday with a full number of men, and are expected to run steadily. Below California several mines are closed; the shutdown is not due to differences about wages. President De Armit, of the New York & Cleveland Gas Coal Company, says that they had a contract with the miners from May to December for 55c. They sold coal on that scale, and the contracts with consumers will not expire until the end of the season, so that they could not possibly pay the 60c. rate under the circumstances.

Connellsville Coke.—The present dry spell is apt to prove disastrous in the coke region; already there has been a curtailment in production, and if rain does not soon fall a shutdown is inevitable. The coke trade shows a lighter gain than for several weeks; but fair gains were made and were fully up to the expectations of the operators, considering the times. Orders for coke are steadily increasing, and many inquiries have been received from men ready to put their stacks in blast. The operators are feeling jubilant. The strike among the coke workers has dwindled down to the foreign element in the region; the English speaking miners have nearly all returned to work. The Germans among the strikers made a break and are nearly all at work. The Mahoning Valley industries are awaiting a supply of coke; some of them are complaining of the difficulty of securing coke. A feeling is going around in favor of organizing an independent coke company that will at all times supply their needs. The week's shipments show an increase of 300 cars. Prices—the fact is there is no fixed price; coke is now sold to the highest bidder.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Aug. 17, 1894.
Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From Jan., '93.	From Jan., '94.
	Aug. 18, 1893.	Aug. 17, 1894.		
Anthracite.	52 23,716	83 16,846	1,441,328	511,447
Coke.....	85 81,450	79 95,904	4,692,213	2,711,039
Charcoal...	35 6,316	22 3,760	288,976	129,717
Totals.....	172 111,482	136 116,460	5,498,447	3,351,903

Pig Iron.—In this market the situation has not changed either for the better or for the worse since our last report. There is no appreciable increase in the light demand which has prevailed during the past few weeks and prices are neither firmer nor higher. Consumers hereabouts continue to buy just enough to meet their urgent requirements and no more. Almost every order that is placed is for prompt or immediate delivery, showing that buyers in almost all cases let their stocks run down almost altogether, and when they do buy it is in small lots that last only a few weeks. Only when business generally grows better will the iron market show the hoped-for improvement.

From other centers the reports that reach us are more encouraging. It is expected, and not without reason, that once the uncertainty of the tariff is ended, business men will have some basis for the future, and orders in various lines which have been delayed until the bill becomes a law, will now be placed. This general improvement in business throughout the country is expected to act very favorably on the iron market. Quotations at tidewater are as follows: Northern brands, No. 1,

\$12.25@13; No. 211. 25@12.50; gray forge, \$10.25 @ \$11. Southern irons, No. 1, \$11.75@13; No. 2, \$11.75@11.50; No. 1 soft F., \$10.75@11.50; No. 2 soft F., \$10.25@11.25. Scotch irons are quoted Coltness, \$21.50@22; Eginton, \$19.50@20; Sum merte, \$20.50@21.50.

Billets and Rods.—No sales are reported this week. Consumers still regard seller's prices as too high. Quotations are nominally: Domestic billets, \$19@20; wire rods, domestic, \$27@27.50; foreign rods, \$39@40.

Manufactured Iron and Steel.—There is very little new business to report in this market. Prices show little or no change from last week. We quote: Angles, 1 3/8@1 1/4; axles, scrap, 1 1/2@1 60; delivered steel, 1 4/8@1 55; bars, common, 1 1/2@1 30; refined, 1 25@1 40; on dock; beams, up to 15 in., 1 4/8@1 50; channels, 1 4/8@1 50; on dock; steel hoops, 1 45@1 75; delivered; links and pins, 1 40@1 65; plates, flange, 1 60@1 80; fire-box, 1 80@2 10; marine, 2 45@2 70; sheared, 1 80; shell, 1 40@1 60; tank, 1 30@1 40; universal mill, 1 25@1 40; tees, 1 50@1 60, all on dock.

Merchant Steel.—This market continues unchanged as to prices and volume of business. Quotations this week are: Tool steel, 5 75@6 25; tire steel, 1 60@1 75; toe calk, 1 70@1 90; Bessemer machinery, 1 25@1 50; open-heart machinery, 1 90@2; open-heart carriage spring, 1 90@2; crucible spring, 3 50@3 75.

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

Rail Fastenings.—This market continues exceedingly dull. Quotations are as follows: Fish and angle plates, 1 20@1 40, at mill; spikes, 1 50@1 75; bolts and square nuts, 2@2.25; hexagonal nuts 2 10@2 30, delivered.

Spiegeleisen and Ferromanganese.—There is nothing doing in this market. Quotations remain nominally: Spiegeleisen, 10@12%, \$21@22; 20%, \$25@26. Ferromanganese, \$51.50@53.

Steel Rails.—The steel rail market is quiet and featureless. Prices for standard sections continue \$24 at mill and \$24.80 at tidewater.

Tubes and Pipe.—Business in this market shows a slight improvement, and a better feeling prevails in consequence. There is no change in prices. Ruling discounts are: On 1 1/2 in. and smaller, 60, 10 and 5 for plain black pipe, and 50, 10 and 5 for galvanized; for 1 1/2 in. and larger, 70, 10 and 5 for black, and 60, 10 and 5 for galvanized.

Buffalo. August 16.
(Special Report of Rogers, Brown & Co.)

We are able to record this week a decided improvement in the demand for iron, although the volume of business still remains far below the average condition. The demand comes chiefly for iron to go into immediate consumption, with a sprinkling of inquiries for larger contracts running into the future from those who think the business skies are brightening. Lake Superior charcoal seems to be the weakest on the list. The prices on Southern and Lake Superior coke brands are well sustained. Good foundry iron continues to be scarce, and the output small. In this state there is only one coke furnace in blast at present. We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 foundry, strong coke iron, Lake Superior ore, \$11.25; No. 2 foundry, strong coke iron, Lake Superior ore, \$10.75; Ohio strong softener No. 1, \$11.25; Ohio strong softener No. 2, \$10.75; Jackson County silvery No. 1, \$15.75@16.75; Lake Superior charcoal, \$14; Tennessee charcoal, \$15.50; Southern soft No. 1, \$11.75; southern soft No. 2, \$11.50; Hanging Rock charcoal, \$18.50.

Chicago. Aug. 15.
(From our Special Correspondent.)

There has been somewhat of an improvement in the various iron trades in this vicinity during the past week. Orders in nearly all lines are noticeably on the increase, while the volume of inquiries is much larger. Many of the mills, furnaces, etc., are now running night and day to supply demand, as stocks on hand in no instance at the end of the recent strike were large enough to equal the call.

Pig Iron.—Business in pig iron shows a gain with the week. Sales are quite numerous in lots of from 50 to 1,000 tons, the latter quantity having had three or four calls, but the main demand was in small lots, presumably for immediate consumption. The furnaces, almost to a unit, are working full time to turn out enough material to supply demand, as their stocks have been almost exhausted through their inability to operate for want of fuel. Next week another furnace will be blown in at the Milwaukee works of the Illinois Steel Company. The North and South Chicago works are now running in full blast. Southern iron has had little call for the week. A couple of fairly good orders are noted in coke iron, but they were for very low prices. Beyond that Southern iron is extremely dull. Quotations are, per gross ton f. o. b. Chicago: Lake Superior charcoal, \$14.25@14.75; Lake Superior

coke No. 1, \$10.25@10.50; No. 2, \$10.00@10.25; No. 3, \$9.50@9.75; Jackson County silveries, \$14.50@ \$15; Southern coke, foundry No. 1, \$10.75@11; No. 2, \$10.25@10.50; No. 3, \$9.75@10; Southern coke, soft, No. 1, \$10.50@10.75; No. 2, \$10.25@10.50; Southern car-wheel iron, \$17.50@18; Southern silveries No. 1, \$11.75@12; No. 2, \$11.25@11.50; Tennessee charcoal No. 1, \$14@14.50; Bessemer, \$11.50@11.75; Ohio strong softeners, \$12.75@13.25.

Structural Material.—Bridge work still constitutes the main business now going in structural material. Building material is in but limited demand. Quotations are f. o. b. Chicago: Angles, 1 5/8@1 55; tees, 1 7/8@1 80; universal plates, 1 5/8@1 55; beams and channels, 1 5/8@1 60.

Plates.—A slight improvement is observed for the week, particularly in business from mill. Prices are: Flange steel, 1 7/8@1 80; fire-box steel, 3 5/8@4 50; tank steel, 1 4/8@1 50; boiler tubes, 75% discount.

Merchant Steel.—Orders for small quantities are in fair number. Consumers are yet awaiting prospects and a really good business may not therefore be expected for some time. Quotations are, carload lots: Smooth finished machinery, 1 80@1 90; tire steel, 1 70@1 80; Bessemer bars, 1 45@1 55; toe calks, 2 05@2 15; crucible spring, 3 40@3 65; tool steel 6 1/2 c. and upward; specials, 12@20c.

Galvanized Sheet Iron.—Sales for stock are few on account of limited supply. The greater part of the business now going is done direct from mill. Quotations are 75, and 10% off from stove, and 75-10 and 5% off from mill.

Block Sheet Iron.—There is hardly any movement in block sheet, with prices nominal, at from 2 40 to 2 45c.

Bar Iron.—A few good sized contracts have been placed during the week, and business has a decided look for the better. Some of the agricultural implement manufacturers are yet holding off, awaiting more settled conditions. It is considered quite positive that prices will soon advance. Present ones bring 1 05@1 10 c. f. o. b. Chicago.

Billets.—Consumers are holding off, possibly awaiting the advent of lower prices. Business for the week was small at \$18@18.25.

Steel Rails.—Orders are coming in for small quantities aggregating during the week to several thousand tons, the total sales being a trifle above preceding week. Quotations are \$25@27.

Old Rails and Wheels.—Business continues dull, with little call for old rails or wheels. Old rails are quoted at \$10.50@11; old wheels, \$10@10.25.

Scrap.—Some few sales of small lots at low prices are noted during the week. Quotations are largely nominal, which are: Forge, \$8.50@9. Cast borings, \$3.50@4; wrought turnings, \$4@4.50; axle turnings, \$6@6.50; mixed steel, \$5@5.50; tires, \$12.50@13; iron axles, \$13@13.50.

Philadelphia. Aug. 17.
(From our Special Correspondent.)

Pig Iron.—Within 24 hours about a dozen round lots of forge iron have been contracted for by mill owners, not because of new orders received, but because stocks were exhausted. All kinds of crude iron are firmer in price, but not higher. Too many options are out. Bessemer is urgently wanted. Lehigh foundry is doing better, but still buyers hold off, waiting for new work to come in. No. 1 is \$12.50@13; No. 2, \$11.50@12; for use, \$10@10.75; Bessemer, \$13.50.

Muck Bars.—Prices are firmer, and \$20 for good stuff is now asked.

Steel Billets.—The deadlock on prices for deliveries within 30 days continues. Parties who want stock later in the fall are offering \$18, but receive no encouragement. Early delivery prices are \$19@19.50. Buyers admit they may be driven by press of orders to pay sellers prices.

Merchant Iron.—Were it not for the business that is lost to us by western competition, we would have nothing to complain of. Even since Monday there has been an increase of small orders from buyers, who are apprehensive of hardening rates. The larger orders offered will have to be taken at a little over one cent.

Nails.—Very little change in nails. Buyers know that production will be such as to keep stocks at a maximum point. Only retail lots are selling.

Skelp.—There are rumors of large transactions in skelp at an early day. Quoted 1 25@1 30.

Sheet.—Small orders are the rule at firm prices for early delivery. Manufacturers do not offer concessions on late deliveries as freely as two or three weeks ago.

Pipes and Tubes.—Parties in correspondence with pipe line builders report a halt. Mill owners report the usual run of small orders.

Structural Material.—Manufacturers think more of the big bridge orders that are talked of than the small orders that barely enable them to keep going. Angles, 1 4/8; beams and channels, 1 5/8.

Plate and Tank.—Heavy plate and flange iron was ordered in small lots at 1 25 and 1 55 respectively. There is talk of big business in a few days.

Steel Rails.—Very little business outside of repairing orders, and these are increasing each week. Standard sections \$24.

Old Rails.—Quite a demand has sprung up for old iron rails at \$11.50.

Scrap Steel.—Ten dollars for heavy and \$8 for light, with quite a demand.

Pittsburg. Aug. 16.
(From Our Special Correspondent.)

Raw Iron and Steel.—The iron and steel market at the present writing is certainly in a healthy condition, stocks at the furnaces being very light and prices steadily maintained, leading brands being held firmly. The outlook for the fall and winter trade indicates a large and active business, and the undertone of the market appears to be gaining strength daily. The tariff question being out of the hands of Congress and a settlement reached, business men will be able to gaze the situation accordingly. The continued draught is operating against coke production, several plants being compelled to shut down for the want of water. In our last we gave a list of Pittsburg and western furnaces in blast; this list will be largely increased as soon as circumstances will permit. As usual, dealers differ in regard to the fall and winter trade; many are of the opinion that trade will be active and prices decidedly more favorable for makers; others shake their heads and seem to have little faith in the future. We think the latter party are mistaken; the country, East, West, North and South, was never so bare of raw and finished iron and steel as at the present time. We hear of contracts for mammoth buildings at various points which will require a large amount of material before they are completed. This is only one branch, and others will require heavy amounts of manufactured and raw material before the end of the year. As a matter of fact, the lion's share will be furnished from this city and vicinity. Again, the depression has been so prolonged, and consumers have found their policy of hand-to-mouth buying productive of such beneficial results to themselves that it requires a pretty strong and steady movement to create any confidence in the immediate future of the market. There is, nevertheless, a general feeling on the part of producers that the conditions of small supply and low rate of daily output are favorable to an improvement in the market if there should be even a moderate increase in the demand for crude and finished material.

Latest.—During the past 24 hours the market has exhibited increasing firmness with an increased inquiry for Bessemer pig, foundry No. 1 and No. 2 holders asking 25c advance. Grey forge and No. 1 mill firm, with an advance of 15 to 25c per ton. Steel billets not very active, with prices fairly maintained. Other descriptions show no particular change.

To the statement of active furnaces in last week's report, which was very full, we can add the Nesbannock, of Newcastle, Pa., which will blow in next week.

COAL SMELTED LAKE AND NATIVE ORE.		2,000 Billets, Aug., Sept., at mill.	
Tons.	Cash.	18.00	
5,000 Bessemer, Aug., Sept. .. \$11.85		1,000 Billets, Aug., at mill ..	7.75
3,000 Bessemer, September, October .. 12.00		500 Billets, prompt, at mill ..	18.00
2,000 Bessemer, August .. 12.00		500 Billets, Aug., at mill ..	17.80
1,500 Bessemer, August .. 12.00		SKELP IRON.	
1,000 Bessemer, prompt 12 25		700 Sheared ..	1.32 1/4 m.
1,000 Grey Forge, August, September .. 10.00		400 Wide gr'vd. ..	1.20 4 m.
1,000 Grey Forge, prompt .. 10.15		300 Nar. gr'vd. ..	1.20 4 m.
750 Grey Forge .. 10.00		SKELP STEEL.	
500 No. 1 Foundry .. 12.25		1,000 Wide gr'vd. ..	1.13 4 m.
500 Grey Forge, spot .. 10.25		700 Sheared Iron ..	1.27 1/4 m.
300 Grey Forge .. 10.10		500 Nar'w gr'vd. ..	1.10 4 m.
200 White Iron .. 9.50		MUCK BAR.	
200 Grey Forge .. 10.10		500 Neutral, Aug.	19.50
100 No. 2 Foundry .. 11.25		BLOOMS, BILLETS AND BAR ENDS.	
100 Bessemer .. 12.25		600 Delivered ..	11.50
CHARCOAL.			
50 Cold Blast .. 23.00		STEEL WIRE RODS.	
50 Cold Blast .. 23.75		500 Five gauge American, at Mill ..	24.50
50 No. 2 Foundry .. 16.60		FERRO-MANGANESE.	
50 No. 1 Foundry .. 17.60		100 8% Delivered ..	52.00
25 No. 2 Foundry .. 16.65		100 8% Ex ship at seaboard ..	51.50
25 Cold Blast .. 24.00		SHEET BARS.	
BLOOMS, BILLETS AND SLABS.			
Tons.	Cash.	200 Delivered ..	23.00
2,500 Billets, Sept., Oct., at mill ..	\$7.50	SPEITER.	
		100 Tons, per 100 lbs. .	3.31

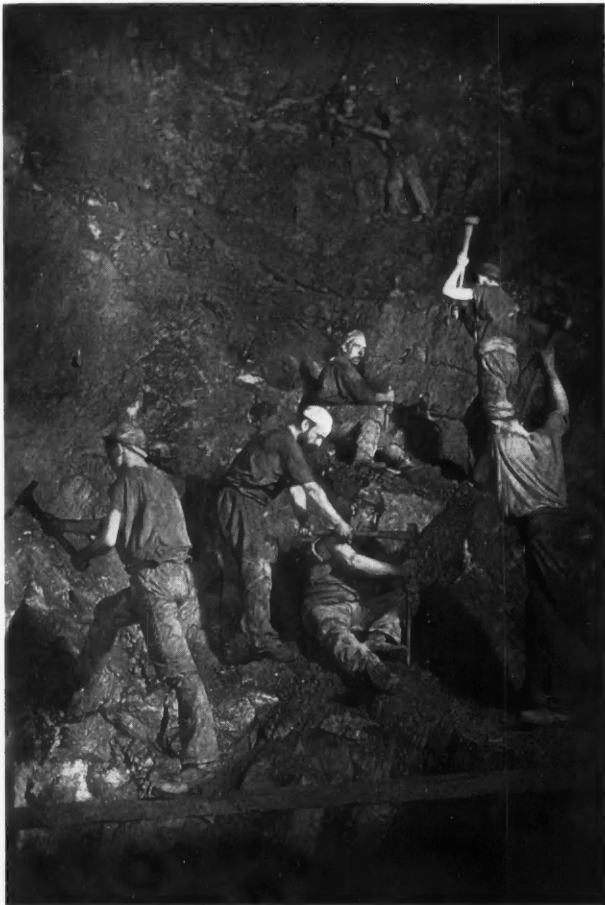
METAL MARKET.

NEW YORK, Friday Evening, Aug. 17, 1894.
Gold and Silver.
Prices of Silver per ounce Troy.

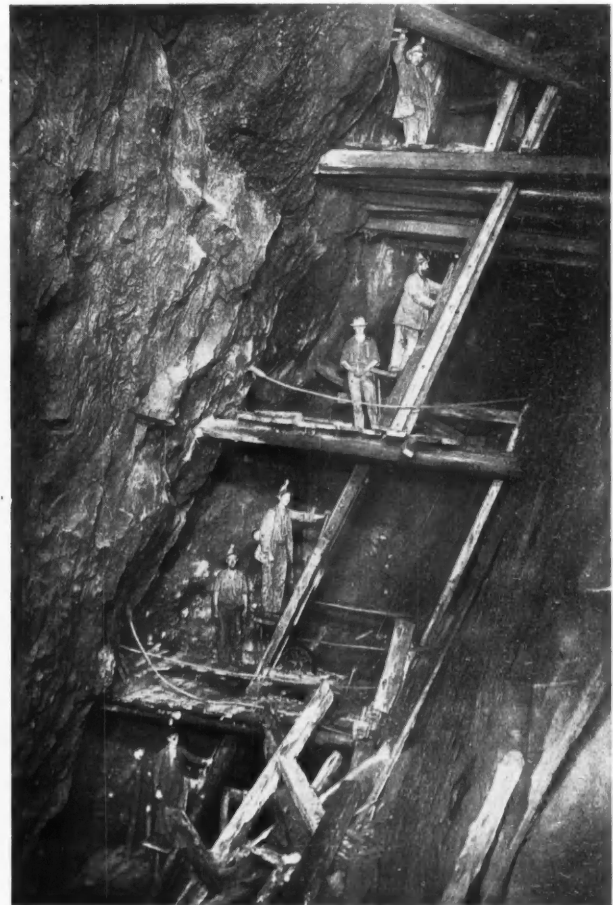
August.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	August.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
11	4.87 1/4	28 1/2	62 1/2	.486	15	4.87 1/4	28 1/2	63	.488
13	4.87 1/4	28 3/4	62 3/4	.486	16	4.86 1/2	29 1/2	62 3/4	.484
14	4.87 1/4	28 3/4	62 3/4	.485	17	4.86 1/2	29 1/2	62 3/4	.484

The market opened steady at unchanged quotations this week, but closed steady at a sharp advance of 1/4 d. per oz. The rise is due to speculative buying on a possible Chinese loan, and the tendency seems uncertain.

SUPPLEMENT TO
THE ENGINEERING AND MINING JOURNAL, AUGUST 18, 1894.



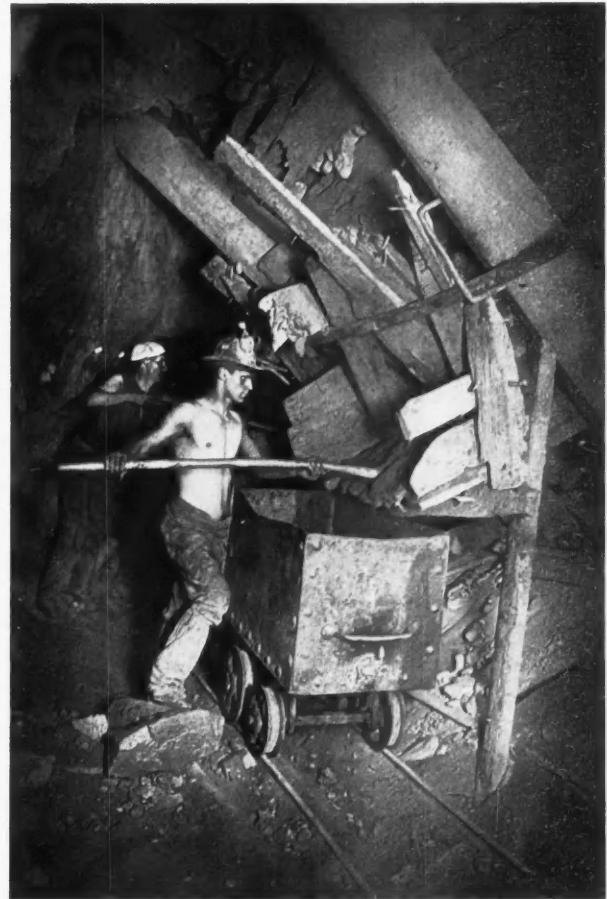
4. UNDERGROUND STOPING, EAST POOL MINE.



5. THE MAN ENGINE AT DOLCOATH MINE.



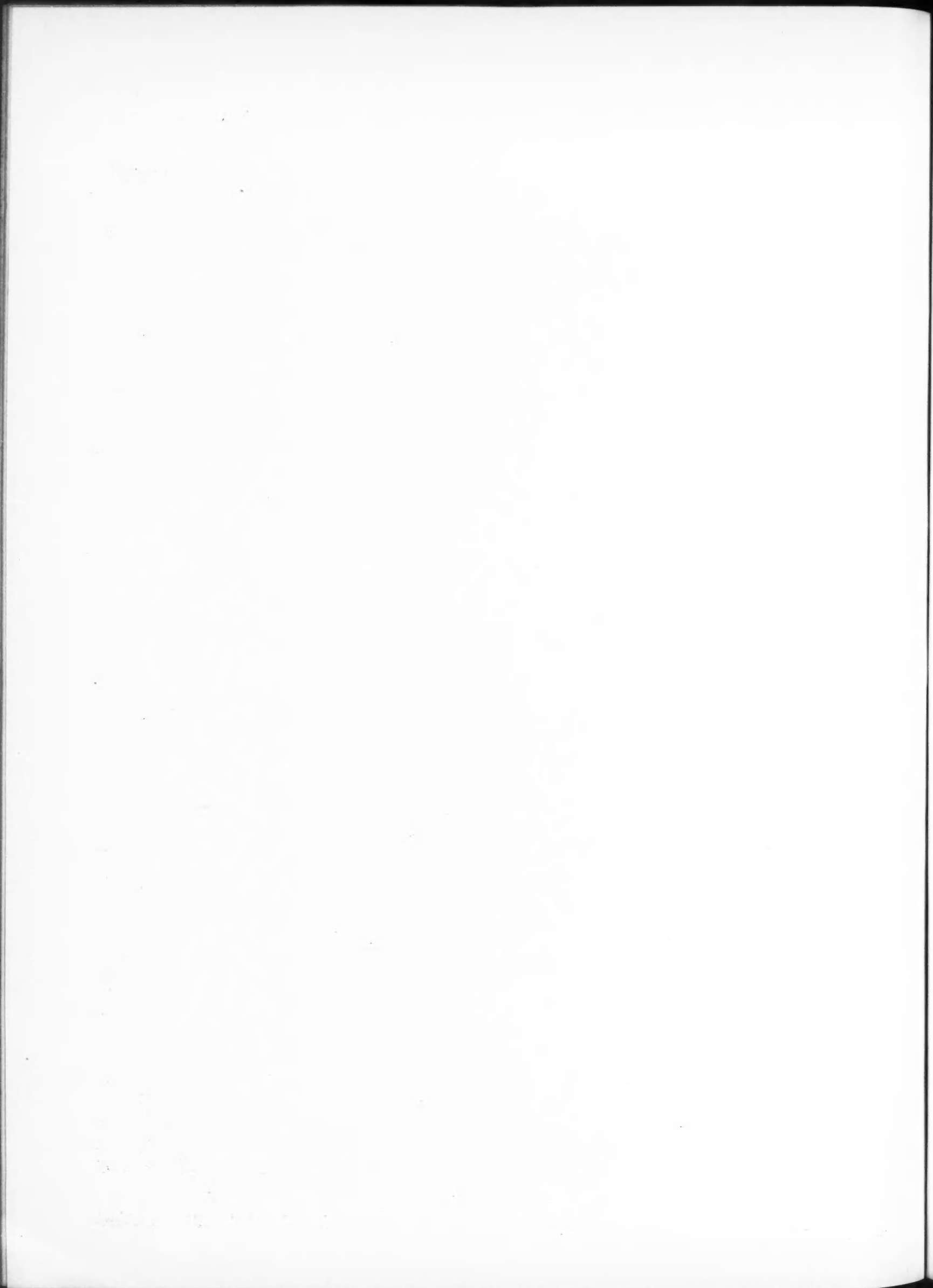
6. GIG AT DOLCOATH.



7. A MILL AT THE 412, DOLCOATH MINE.

CORNISH TIN MINING IN PHOTOGRAPH.

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The United States Assay Office at New York reports the total receipts of silver at 137,000 oz. for the week.

Gold and Silver Exports and Imports at New York, Week Ending August 11th, 1894, and for Years from January 1st, 1894, 1893, 1892.

Table with columns for Gold (Exports, Imports) and Silver (Exports, Imports), plus Total excess, Exp. or Imp. for weeks ending Aug 11, 1894, 1893, and 1892.

The gold imported was nearly all from the West Indies; the silver from South America. Of the gold exported \$500,000 went to Germany and \$465,000 to France.

During the five days ending August 16th the imports and exports of gold and silver from the port of New York were as follows: Imports, gold, \$345,617; silver, \$63,977. Exports, gold, \$400; silver, \$752,900.

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

Table with columns for Gold (Exports, Imports) and Silver (Exports, Imports), plus Total excess, Exp. or Imp. for July 1894 and 1893, and for seven months to July 31st, 1894 and 1893.

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

NOTES OF THE WEEK.

The signs of improving business continue to multiply, and there can be no question that the movement toward normal conditions will be very much hastened by the settlement of the tariff question.

The settlement of the tariff discussion by the adoption of the Senate amendments is discussed in another column.

No gold exports are reported this week. Exchange has fallen below the point where exports can be profitably made.

The Treasury has been gaining slightly in gold during the week, through the demands for currency shipped West, on gold deposited at the sub-treasury here.

The Bureau of Statistics, Treasury Department, reports the imports and exports of merchandise for July and for the seven months ending July 31st as follows:

Table comparing July 1894 with 1893, and seven months to July 31st 1894 with 1893, showing Exports and Imports.

It will be noted that for the seven months the exports were very nearly the same in both years, differing only by the comparatively trifling sum of \$98,933, or less than one-tenth of 1%.

The excess of merchandise exports this year was \$55,945,153; the excess of exports of gold and silver was \$33,265,467, the sum of the two making an apparent balance of \$144,210,622 in our favor.

The extent to which the present state of the money market and the dropping of speculation has appreciated the value of investment securities is shown by the following extract from the 'Financial Chronicle' of New York.

We have already said that the total sales for last month were not up to the average for 1894, but it must be remembered that this average has been unusually large.

The statement of the New York banks for the week ending August 11th shows increases of \$2,318,200 in loans and \$505,800 in specie, and \$2,180,700 in surplus, decreases of \$519,400 in deposits, \$27,200 in circulation, and \$2,686,500 in legal tenders.

A convention has been held in Saratoga this week, at which a large number of bankers from New York City and all parts of the State were present.

The convention decided to hold the annual meeting next year at Saratoga, and adjourned. A banquet was given the delegates at the Grand Union Hotel in the evening by the local bankers and some of the organizers of the association.

In Mr. Preston's address he stated that the combined capitalization of the National banks and trust companies of the State of New York, including the capital, surplus and profits, was stated by Mr. Preston as amounting to \$33,093,136, and the combined resources of the banks and trust companies of the State, \$1,363,463,237.

The Treasury statements begin to show an improvement. The present week especially shows large receipts, which are expected to continue for a time.

and the custom receipts \$6,216,786. The aggregate receipts of the Government so far during August have been \$16,316,349, and the expenditures, \$18,816,000.

The statement of the United States Treasury on Thursday, August 16th, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

Table showing Treasury balances for Aug. 9 and Aug. 16, including Gold, Silver, Legal tenders, and Treasury notes, etc., with changes.

The marked changes are the increase in gold and the large decrease in legal tenders during the week. Government deposits with national banks on August 9th amounted to \$13,365,087, an increase of \$1,312,357 during the week.

A strong demand for silver is reported from London to-day, with a rise in price, as shown in our table above. The buying is understood to be chiefly for Chinese account, and the price has been stimulated by reports of a Chinese loan to be bought out soon in London.

The Bank of France on Thursday, August 16th, reported its specie holdings at 1,893,557,000 fr. gold and 1,265,656,000 fr. silver, an increase, as compared with the corresponding date last year, of 172,523,700 fr. gold and a decrease of 5,848,600 fr. silver.

The Bank of England on Thursday, August 16th, reported its gold holdings at £38,804,827, showing an increase of £13,278,816 as compared with the corresponding date last year.

In London, August 7th, in the Appeal Court, before the Master of the Rolls and Lords Justices Kay and A. L. Smith, judgment was given in the appeal of the plaintiffs in the action of the Republic of Chile and others vs. the London & River Plate Bank.

Shipments of silver from London to the East for the year up to August 2d are reported by Messrs. Pixley & Abell's circular as below:

Table showing silver shipments to India, China, and The Straits for 1893 and 1894, with changes.

For the week ending August 2d the shipments reported were £153,000 to Bombay.

On Wednesday the usual sales of India Council bills were shown in London, and a further rise in exchange was shown, 40 lakhs being taken at 13 1/2 d. per rupee, a rise of the fraction over last week.

The following statement shows in sterling the specie holdings of various European banks:

Table showing specie holdings of Imp. Bank, Germany, Austro-Hun. Bank, Netherlands Bank, Nat. Bank of Belgium, Bank of Spain, and Bank of Russia.

The banks of Germany and Belgium do not report gold and silver separately.

In London, August 16th, in the House of Commons, Henry Fowler, secretary for India, made a statement of the Indian Budget. He gave the income as 9,017 lakhs, the expenditures at 9,100 lakhs and the net revenue as 5,160 lakhs. The increase of net revenue over the estimates, he said, was 202 lakhs. Mr. Fowler said that the Indian government had no intention of reopening the mints to the free coinage of silver. The experiment of closing the mints would be well tried before there would be any thought of abandoning it. So far there had been no reason for alarm. The great difficulty was the steady depreciation of silver, and sooner or later this would force India to go over to the gold standard. Mr. Fowler explained that there had been a loss of 1,252 lakhs, which was entirely due to the depreciation of exchange. Apart from the question of exchange, the general position of Indian finance and commerce was satisfactory. Right Hon. Henry Chaplin and Sir William R. Houldsworth deprecated the continued closure of the Indian mints to the free coinage of silver.

Di-patches received from Calcutta the same date say that the government is likely to convert gradually the whole 4% rupee debt into 3%. This report has caused some alarm, in view of the effect which such a conversion would have on exchanges. A portion of the rupee debt, known as the 1842-43 issue, was recently converted. The interest on this debt is payable in Indian currency.

The Vienna correspondent of the London "Economist" says: On July 24th, two years after the inauguration of the new standard, there was at last published in the official "Gazettes" of Vienna and Budapest the three acts by which it is to be put in operation. The first act authorizes the finance minister to withdraw from circulation 200,000,000 gulden of State notes. It is left to the discretion of the two governments whether, after the withdrawal of the 1 gulden notes, amounting now to 60,000,000, the 5-florin notes or the 50 florin notes shall be next retired. The public hopes that the 50 gulden notes will be first withdrawn, as they have not been so long in circulation as the 5-florin notes, and can easily be replaced by notes of the bank, and because the public wishes to keep in circulation a smaller note as long as gold coins of 10 crowns are not yet put into circulation and smaller notes not emitted by the bank. The public, having been accustomed to small paper money for more than a generation, is unwilling to have 10 florin silver or more in pocket at once, an experience undergone a long time ago in the United States. Perhaps our governments are at last disposed to imitate the example of the German Empire, and let a part of the five gulden State notes remain in circulation: Another act authorizes the Austrian Finance Minister to take 24,000,000 crowns of the new gold coin, in order to deliver them to the bank against silver and bank notes. The same authority is conferred on the Hungarian Finance Minister for 186,000,000 crowns. A further act empowers the Austrian Finance Minister to reduce the emission of salinenscheine (taxchequer bills secured on salt mines) to 70,000,000fl. By a special decree, three terms are appointed for the cancelling of the 1-florin notes. Of these no more will be issued, and those at present in circulation will cease to be legal tender on December 31st, 1895. They are still accepted at the public offices up to June 30th, 1896, but after December 31st, 1896, they will be totally cancelled.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars	\$5.1	\$5.2
Peruvian soles and Chilean pesos.....	51 1/2	52 1/2
Victoria sovereigns.....	4.87	4.90
Twenty francs	3.86	3.90
Twenty marks	4.75	4.83
Spanish 25 pence.....	4.78	4.83

Other Metals.

Copper.—The change in the situation at Washington has given a far better tone to the market than could rightfully have been expected by the most sanguine, and while Lake copper was freely offered at 9c. last week, and by one interest at even somewhat less, without finding buyers, new orders, from speculators and manufacturers, can be had at 9c., but there are no sellers at less than 9 1/2 to 9 3/4, and but few at the lower of these two prices. As is usually the case, when prices are advancing and the markets stiffening, the consumption seems to be increasing. Casting copper also has improved, as plenty of orders are now to be had at 8 1/2, at which but little could be sold a few days ago. Arizona pig copper is now quoted at 8 1/4 to 8 1/2 and electrolytic ingots at 8 1/4 to 8 3/8.

The foreign market, however, improved materially, G. m. b's closing to-day at £29 10/- for spot and £40 for three months promiss, as against £38 15s and £20 2s. 6d. respectively last week. This betterment is not so much due to an increased demand (although the statistics for the first half of the present month show a decrease of 400 tons in the visible supplies) as to a belief that American business will be very much better within a few months and that that will reduce the quantities available and necessarily to be shipped to Europe.

An additional factor, and perhaps the one to which the most of the improvement is due, is that the group of mining companies which was forcing sales abroad at prices far below those ruling here has now ceased doing so.

Recent sales of furnace material in England are reported by Messrs. James Lewis & Sons' circu as follows: 100 tons Libiola sulphuret ore, 10%, at 7s. per unit; 100 tons Mexican 20% ore, 7s. per unit; 100 tons Portuguese sulphuret 5% ore, 6s. 7 1/2 d. per unit. The following figures give the production (in tons of 2,240 lbs.) of copper in the United States, and also by the chief foreign mines, and the exports from the United States, for July and the seven months ending July 31st:

	July.	Seven mos.
Production, fine copper, long tons.....	12,699	86,590
Reporting mines in the United States.....	1,340	9,380
Pyrites and outside sources, United States.....	6,960	52,253
Reporting foreign mines.....	4,399	64,957
Total production, long tons.....	21,399	148,227
Exports from United States, fine copper.....	7,226	46,995

As compared with the statement for the corresponding period last year the production from reporting mines in the United States shows an increase of 13,071 tons, or 17 1/2%. There was an increase of 19,453 tons, or 70 1/2%, in the exports from the United States.

Copper Exports.—The exports of copper from the port of New York during the week ending August 16th were as follows:

		Pigs	50 tons
Swansea—Kansas City	Ingots	45	"
St. Petersburg—Buffalo.....	Plates	10	"
Hamburg—Persia	Bars	251	"
Liverpool—Somadic.....	Pigs	20	"
Havre—La Navarre.....	Bars	10	"
St. Petersburg—Hindoo	Ingots	112	"
Rotterdam—Rotterdam.....	Ingots	200	"
.....	Plates	70	"
Bordeaux—Wallachia.....	Bars	50	"
Havre—La Navarre.....	Ingots	125	"
Rotterdam—Spartadam.....	Ingots	2.0	"
Liverpool—Araulia.....	Pigs	163	"
London—Massachusetts.....	Pigs	50	"
Marseille—Alesia.....	Pigs	59	"

Exports of copper from Baltimore for the week ending August 11th are reported by our special correspondent as follows:

Hamburg—Grimm.....	535 bars	112,176 lbs.
Havre—Klio.....	676 cakes	189,417 "
"	630 bars	101,046 "
"	14,212 ingots	288,800 "
"	3,008 plates	56,000 "
Antwerp—Rialto.....	1,449 ingots	22,409 "
Hamburg—Galicia.....	1,805 bars	336,123 "
Rotterdam—Patapaci.....	42 cakes	17,929 "
"	887 bars	112,317 "
"	1,868 ingots	22,400 "

Other metals exported during the week were: 38 barrels sulphate of copper, 22,800 lbs., to Havre; 800 iron car wheels, 452,000 lbs., to Liverpool.

Tin has been in far better demand this week than for a long time past, as the stocks of dealers had run so low that, of necessity, they had to be replenished. The natural result of this has been an increase in prices which we have to-day to give as 19 50 for spot and August, for September, and 19 60 for later delivery; and as even these figures are below the equivalent of cost of importation, the outlook is for still another advance.

Prices in London are £70 for spot and £70 10s. for futures at the close, as against £67 17s. 6d. and £68 7s. 6d. respectively a week ago, with owners holding their possessions firmly.

Lead.—As was to be expected in the event of the passage of the tariff bill, the market for this article, with the exception of supplies on the spot, has flattened, and consumers can now fill their future wants by importing foreign lead at from 3 20 to 3 25. However they have come but little in this line as yet, as the bill has not become a law. When it does it would seem but natural to expect that large orders will be sent to the other side, with the effect of still further enhancing values there. The market in the West has not been as much affected as that in the East, and naturally so, as out there the foreign product will not be able to compete with the domestic. Nevertheless, as the quantity of lead available for the Western market will be in excess of the demand, prices there must come down, although it is likely that henceforth there will be a smaller difference between values here and there than in the past.

The foreign market, as already indicated, is higher than it was a week ago, to day's prices being £9 18s. 9d. for soft Spanish and £10 1s. 3d. for English metal.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: "Lead unsettled and difficult to give accurate quotations. The new tariff bill is causing buyers to sail close to shore. Lead sold here as low as 3 20c. on the 16th inst."

Silver is the laggard, and instead of improving has done the contrary. Sales on the basis of 3 10 East St. Louis, equal to 3 35 New York, have been reported, and as the output is gradually increasing, while the demand is not doing so, no improvement in the near future can be looked for.

In the London market special are quoted at £15 7s. 6d., and good ordinaries at £15 10s.

Antimony is in moderately good demand at 8 1/4c. for Hallett's; 8 1/2c. for L. X.; 10c. for Cookson's, and 10c. for U. S. French Star.

Quicksilver.—This market continues very quiet. Prices are: New York, \$46; London, £6. 5s.

Aluminum.—Current quotations are as follows, No. 1 being over 98% pure metal, and No. 2 over 94% pure; No. 1, in rolling ingots, 75c. per lb. for small lots at factory; 78c. in 100 lb. lots; 70c. in ton lots. No. 1 in ingots for remelting, 65c. for small lots, 60c. for 100 lb. lots, and 55c. in ton lots. No. 2 in ingots

for remelting, 60c., 55c. and 50c. per lb., according to size of order. Sheets, 80c. @ \$4 40 per lb., according to size and thickness. Wire, \$1 @ \$2 40 per lb., according to gauge. Castings, 90c. per lb. up, according to number, weight, patterns, etc.

Abroad quotations for 99% pure metal in Paris are 6 25 @ 7 75 fr. per kilo. for ingots; 7 50 @ 11 50 fr. for sheets, 11 @ 17 50 fr. for wire, and 19 @ 22 fr. for tubes. The Neubaun Company quotes No. 1 (guaranteed 98% pure, and in fact 99 7/8%) at 5 francs per kilo. for ingots in small lots; for large lots a considerable discount is allowed.

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

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

Nickel.—Quotations are nominally 44 @ 50c. per lb., according to grade. Business is dull, and some sales have been made below these figures, say 39 @ 45c. Abroad the demand has also been light, and prices have a downward tendency.

Platinum.—Abroad the prices are slightly higher, owing to light supply.

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

Phosphorus.—Quotations continue steady at 50 @ 5 1/2c. per lb., f. o. b., New York or Philadelphia.

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

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Aug. 17.

Heavy Chemicals.—We do not find any improvement in this market and must continue to report a very quiet business at unchanged prices. Caustic soda is in the same jobbing demand that has characterized this article for some weeks past. Carbonated soda ash and alkali are in slightly better inquiry. Bleaching powder continues very dull. Prices generally are without change from last week. We quote: Caust. soda, 60%, 2 82 1/2 @ 2 9 1/2c.; 70%, 2 60 @ 2 70c.; 74%, 2 62 1/2 @ 2 72 1/2c.; 76%, 2 70 @ 2 80c. Carbonated soda ash, 48%, 1 @ 1 25c.; 58%, 1 @ 1 15c. Alkali, 48%, 1 @ 1 15c.; 58%, 1 @ 1 10c., according package. Sal soda, 82 1/2 @ 95c. Bleaching powder, 1 75 @ 2c.

Acids.—Only a fair consumptive demand for acids is reported this week. There are no features of interest and prices are unchanged from last week. Quotations are: Acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, \$1.40 @ \$1.60; muriatic, 18", 80c. @ \$1; 20", 90c. @ \$1.10; 22", \$1 @ \$1.25; nitric 40", \$4 42", \$4.50 @ \$4.75; sulphuric, 76c. @ \$1; chamber acid, \$6 per ton. Mixed acids according to mixture, oxalic, \$6 5 @ \$7 50 per 100 lbs. Blue vitriol is quoted at \$3 50 @ \$3 62 1/2; glycerine for nitroglycerine, 1 1/2 @ 1 2 1/2c., according to quantity and quality.

Brimstone.—The market for Sicilian brimstone continues very quiet. Quotations are: Best unmixed seconds on the spot, \$13 00; best thirds, \$1 less. Future shipments, \$16.25 for seconds and \$1 less for thirds.

Fertilizing Chemicals.—No new business of consequence is reported in the fertilizing market. Buyers have not yet commenced to purchase any more stocks for the fall trade, and the market in consequence is very quiet. We quote this week: Sulphate of ammonia gas liquor \$3.75, and \$3.25 for bone. Dried blood, \$2 10 per unit for high grade and \$2 @ \$2.05 for low grade. Azotine, \$2.10. Concentrated phosphate 60% available phosphoric acid, 75c. per unit. Acid phosphate, 13% to 15%, av. P2O5, 60c. per unit at seller's works in bulk. Dissolved boneblack, 17% to 18% P2O5, 90c. per unit. Acidulated fish scrap, \$15 @ \$16, and dried scrap nominally \$25 f. o. b. fish factory. Tankage, high grade, \$22 50 @ \$23; low grade, \$21 @ \$21.50. Bone tankage, \$23 @ \$24; bone meal, \$24 @ \$25.50.

In lots of 50 tons on contracts we quote: Double manure salts, 48 53% (basis of 45%); New York and Boston, \$1.12; Philadelphia, \$1.14 1/2; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$1.17. High grade manure salts, 90-95% and 98-99% (basis 90%), respectively: New York and Boston, \$2.07 @ \$2.11; Philadelphia, \$2.09 1/2 @ \$2.13 1/2. Charleston, Savannah, Wilmington, N. C., and New Orleans, \$2.12 @ \$2.16.

Phosphate Rock.—Charleston, S. C., quotations are as follows: Acid phosphate, \$8 25 @ \$6 50 cash f. o. b. in bulk; phosphate rock, standard land, kiln dried, \$4.25 @ \$4.50 f. o. b. mines.

Muriate of Potash.—In lots of 50 tons, quotations are as follows: 80 85% and minimum 95% (basis 80%), respectively: New York and Boston, \$1.78 @ \$1.91; Philadelphia, \$1.80 1/2 @ \$1.83 1/2; Charleston, Savan-

nab, Wilmington, N. C., and New Orleans, \$1.83 1/2 @ \$1.86.

Kainit.—Prices for kainit (minimum 23%) in cargo lots for 1894 delivery are as follows for invoice and actual weights respectively: New York, Boston and Philadelphia, \$9 @ \$9.25; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$9.75 @ \$10.

Nitrate of Soda.—This market continues quiet. Quotations are: Spot, \$2.12 1/2 c.; shipments, \$1.95 @ \$2.

NOTES OF THE WEEK.

At an informal meeting of stockholders of the Chicora Fertilizer Company in Charleston, S. C., recently, Mr. George A. Wagener, who, as reported in these columns three weeks ago, bid off the Atlantic Phosphate Company's works for \$51,000, offered it to the Chicora at those figures. The meeting was not an official one, but an individual canvass result, and in guaranteeing the support of the directors if they purchased the Atlantic Company's works, and this it is understood the directors will do.

There was a report that the Royal Imperial Fertilizer plant had been leased by the Imperial Fertilizer Company. Mr. G. Walter McIver, the general agent of the Imperial, confirmed it, saying that the lease of the Royal had been offered the Imperial on favorable terms, and that it had been accepted. The works, Mr. McIver said, will be run only moderately.

Liverpool. Aug. 8.

The chemical trade is still in a depressed condition, but in spite of the bad times, Brunner, Mond & Co. have just declared a half yearly dividend at the rate of 30% per annum, in addition to carrying forward £90,000; which is a very satisfactory result, especially taking into account the state of business this year.

Soda Ash is very quiet for Leblanc makes, and the spot range is nominally somewhere about as follows: Caustic ash, 48%, £3 15s. @ £4 per ton; 57 and 58%, £4 10s. @ £4 15s. per ton.

Ammonia Ash, 58%, is in fair request, at £3 10s. @ £3 15s. per ton net cash for tierces and 5s. less for bags. Soda crystals are only wanted to a moderate extent, and are still quoted at £2 12s. 6d. @ £2 15s. per ton, less 5%.

Caustic Soda is in a lifeless state and orders are scarce. Quotations vary according to export market, and the spot range is nominally about as follows: 60%, £7 5s. @ £8 per ton; 70%, £8 5s. @ £9 per ton; 74%, £9 5s. @ £10 per ton; 76%, £10 5s. @ £11 per ton, net cash. For parcels under 10 tons 5s. per ton extra is charged.

Bleaching Powder is easy in tone, although for hardwood packages the range is still nominally about £7 10s. to £8 per ton net cash, according to market.

Chlorate of Potash can be had for prompt delivery, from re-sellers at 6 1/2 @ 6 3/4 d. per lb., but there is very little business reported. Bicarb. Soda is steady at £6 15s. per ton, less 2 1/2% per 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of Ammonia is scarce, and held for £14 2s. 6d @ £14 7s. 6d. per ton, less 2 1/2% for good gray 24 to 25% in double bags f. o. b. here, according to quality. Nitrate of Soda inactive at £9 2s. 6d. @ £9 5s. per ton, less 2 1/2% per double bags f. o. b. here. Carb. Ammonia: Lump, 3 1/4 d. per lb.; powdered, 4d. per lb., less 2 1/2%.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburgh, St. Louis, London and Paris, see pages 163 and 164.]

NEW YORK, Friday Evening, Aug. 17.

Nothing of interest can be reported of this week's mining stock market. It continues very quiet and utterly featureless. The railroad stock market has been too active to permit the speculators who occasionally dabble in mining securities to pay any attention to the latter this week.

At the close to-day the Comstocks, with a few exceptions, were slightly higher in price than during the early part of the week. Consolidated California & Virginia was very quiet, only 60 shares being sold at \$4.25. Ophir was in better demand, 460 shares having changed hands at \$2.35 @ \$2.70. Savage was stationary at 45c., with sales of 200 shares. There was one sale of 100 shares of Gould & Curry at 67c., and another of 200 shares of Yellow Jacket at 54c. Of Sierra Nevada, 100 shares changed hands at 80c. Mexican advanced from \$1.25 to \$1.45, with sales of 500 shares. Other sales were: 20 shares of Best & Belcher at \$1.55, 500 shares of Chollar at 35 @ 37c., 600 shares of Consolidated Imperial, at 6c., 100 shares of Potosi at 55c., and 200 shares of Union Consolidated at 63c.

The Bodie stocks were in slightly better demand this week. Bodie Consolidated showed sales of 200 shares at \$1.24 @ \$1.35. Bulwer was stationary at 21c., with sales of 40 shares. Of Mono, 300 shares were sold at 21c.

Sales of Victor this week amounted to 200 shares at \$3. No other Colorado stocks were traded in.

NOTES OF THE WEEK.

Following is a statement of the cash balances of certain mining companies on August 6th:

Table with columns for company name and cash balance. Includes entries like Alpha (\$6,700), Alta (\$304), Andes (\$1,389), Belcher (\$1,023), Best & Belcher (\$17,084), Bullion (\$3,899), Bulwer (\$4,817), Bodie (\$31,861), Caledonia (\$3,805), Challenge (\$1,598), Chollar (\$5,411), Consolidated Imperial (\$2,17), Confidence (\$4,288), Consolidated New York (\$3,293), Consolidated California & Virginia (\$97,098), Crown Point (\$12,396), Escondido Nevada (\$573), Exchequer (\$3,982), Gould & Curry (\$2,186), Hale & Norcross (\$22,498), Julia (\$1,084), Justice (129), Kentucky (1,804), Lady Washington (23), Mono (2,164), Mexican (18,568), Nevada Queen (945), Occidental (115), Ophir (10,955), Overman (351), Potosi (3,300), Savage (51), Scorpion (455), Segregated Belcher (5,083), Silver Hill (218), Sierra Nevada (4,411), Standard Consolidated (33,916), Syndicate (914), Union Consolidated (12,722), Utah (1,083).

The indebtedness of other companies on the 6th is reported as follows:

Table with columns for company name and indebtedness. Includes entries like Belle Isle (\$2,799), Commonwealth (21,418), Grand Prize (53), Navajo (67), North Belle Isle (\$2,224), North Commonwealth (2,149).

Boston. Aug. 16.

(From our Special Correspondent.)

The market for copper stocks has had a decided upward tendency the past week on the improved outlook for copper abroad, and the general expectation that a better demand for home consumption will result from the settlement of the tariff question, and the revival of business in all departments of trade. There has been a good deal of activity in Tamarack owing to the desire to realize on the part of holders who bought at the low prices prevailing the past few months, and the quotations have ranged from \$151 to \$166 with closing sale at \$165. The reports from the mine have been moderate in character indicating that the developments so far are satisfactory to the management, and all indications point to a rich yield of ore as works progress.

Dealings in Calumet & Hecla have been light at \$25 to \$29. At the annual meeting yesterday the old board of directors was re-elected. Osceola advanced on moderate sales from \$19 1/2 to \$21 1/2. There is but little stock in the market and an active demand would send it up to \$25 easily. Quincy sold at \$87 for a lot of 20 shares, and the scrip at \$30 1/2 for 100 shares. Atlantic sold at \$8 1/2 for 50 shares and a small lot at \$9. Franklin is steady but dull at about \$8 1/2. Wolverine advanced a fraction to 1%. The annual report, an abstract of which will be found elsewhere, shows that a small profit was realized on operations of the past year. Kearsarge advanced from \$5 1/2 to \$6 on favorable showing of earnings the past six months. Centennial is in moderate demand at \$1 per share.

The Montana stocks have shared in the general activity and advance. Boston & Montana improved from \$23 1/2 to \$25 1/2 on sales of about 1,200 shares. Butte & Boston advanced from \$8 1/2 to \$9 1/2, with sales of about 1,600 shares. The company is said to be practically out of debt.

3 p. m.—With the exception of Osceola the market was a shade off this afternoon. Boston & Montana declined to \$25, and Butte & Boston to \$9. Osceola was firm and advanced to \$22 1/2. Closing prices are: Boston & Montana, \$24 1/2 bid, \$25 1/2 asked; Butte & Boston, \$9 1/2 bid, \$9 3/4 asked; Calumet & Hecla, \$230 bid, and \$225 asked; Osceola, \$2 1/2 bid, \$2 3/4 asked; Quincy, \$87 bid, \$90 asked; Tamarack, \$163 bid, \$165 asked.

San Francisco. Aug. 10.

(From our Special Correspondent.)

The mining stock market has continued in an apparently unstable condition throughout this week, but our weekly current of interest has caused a stronger tone to dominate the market. The North End Comstocks have sold firmer than a week ago and prices, too, have ruled higher. During the last week 50,310 shares changed hands, as compared with 52,160 during the week previous. As the assessment list is not so heavy this month as usual this will aid in strengthening the market. Storey County, as representing the State of Nevada, will contribute \$75,120; in California, Calaveras County will add \$2,000; Placer County, \$5,000, and Nevada County, \$15,000; in Mexico, the State of Chimaltitlan will add \$1,000 and Sinaloa \$6,850; making a grand total of \$104,370 to be collected in this city.

The work done on the Comstock during the last month has served to put quite a number in such condition that at any time the public attention could be arrested and the stock market enjoy another of the spasmodic booms that cause the street with eagerness to jump in and lose its money.

Consolidated California & Virginia has this week dragged the market after it just as it happened to advance or recede in value. To-day it ruled at \$4.15, an advance of 15c. during the week, albeit the sales at the latter price a week ago were very light. Ophir at \$2.50; Mexican at \$1.25; Sierra Nevada at 70c. and Illinois Consolidated at 63c. also show advances on last week's ruling rates.

The Middle Comstocks have remained practically stationary so far as prices are concerned. Best & Belcher has sold for \$1.25; Chollar for 34c; Gould & Curry for 58c.; Hale & Norcross for 72c.; Potosi for 50c. and Savage for 43c.

The Gold Hill stocks are arousing more interest than they have received for quite a long time by reason of the new methods adopted in Crown Point. The low grade gold ore is being treated at a cost of about \$8 for mining and milling, and at this figure it is possible to utilize one that hitherto has received the go-by. The Belcher and Justice mining companies are considering the advisability of following the example set by Crown Point, and on this account these mines are being watched with interest. Belcher at present is selling for 92c., an advance of 7c. during the week; Bulwer for 18c., Confidence for \$1.10; Challenge for 35c.; Imperial for 2c.; Exchequer for 8c.; Justice for 18c.; Kentuck for 10c.; Occidental for 10c.; Overman for 14c., and Yellow Jacket for 50c.

In the Bodie group of stocks Bodie Consolidated has sold steady at \$1.20, a 15c. advance during the week; Bulwer Consolidated at 17c., and Mono at 18c.

The market shaded off a few cents before the close.

BY TELEGRAPH.

SAN FRANCISCO, Aug. 17.—The opening quotations to-day are as follows: Best & Belcher, \$1.40; Bodie, \$1.55; Belle Isle, 5c.; Bulwer, 21c.; Chollar, 29c.; Consolidated California & Virginia, \$4.40; Bureka Consolidated, 25c.; Gould & Curry, 60c.; Hale & Norcross, 67c.; Mexican, \$1.25; Mono, 32c.; Navajo, 11c.; Ophir, \$2.35; Savage, 39c.; Sierra Nevada, 66c.; Union Consolidated, 70c.; Yellow Jacket, 48c.

Paris. Aug. 7.

(From our Special Correspondent.)

There has been, I regret to say, but little change in the market since I last wrote; not that one can expect any material alteration in the course of a single week, but there are now no signs of change in the approaching period. There is less excitement now over the Japan China war, and we begin to hope that no European complications may result from that Eastern trouble. There are disquieting rumors about Russian intentions, however, and one statement which does not promise well is that the Trans-Caspian Railroad is to be extended to the foot of the mountain range bounding the Pamir; that is to the western frontier of China. England has taken no notice of this as yet, but may be expected to in some way.

Suez Canal shows a considerable decline in traffic receipts, and shares have gone down also, but not heavily. Panama shares are steady, the announcement that work would be resumed soon having some effect.

The metallurgical shares are somewhat unsteady, and there have been more dealings than for some time past. Acieries de France have been forced up on reports of a coming dividend. Acieries de la Marine have been in some demand and are firm. The others have been about the same.

In the gold stocks there has been very little doing, and hardly any change in price. For Huanabca (silver) there is some inquiry, though it is a little weaker. The mine itself is doing well, but the continued low price of silver is against the stock. Nickel still continues to decline.

All the copper stocks are weak on the continued low prices of the metal. On the other hand the lead stocks are stronger. The advance in the metal has not been fully held; there has been some reaction, but still part of it is held, and there will apparently be a better market, for a time at least.

Malfidano shows a sharp rise in price after the recent heavy fall. This is due to the published statement that an understanding has been reached with the Vieille Montagne Company, which amounts to a combination. This arrangement, it is said, is to hold until a general zinc syndicate is formed. The latter is possible, since negotiations have been renewed, and with the two largest producers working together the others may think best to abandon their claims and join the syndicate. It was the claims to too great a share for each one which caused the former attempt at combination to fail.

As to the coal and iron stocks, all I can say is that there has been very little new in relation to them. They are all quiet, showing only small dealings, with a few fluctuations, generally downward. The same may be said of the iron mining stocks. The imports of iron and steel this year so far shows some increase. Prices are very low for all kinds of iron manufactures, lower, I think, than with you in proportion to the past range. The exports have not been large, but our trade has been fairly maintained as to quantity.

The accumulation of money still continues, the Bank of France reporting no diminution in its very heavy reserves; but still no activity in speculation, as I have said so often before. AZOTE.

DIVIDENDS.

American Coal Company, Maryland, 3 1/2%, payable at the office in New York, September 1st. Transfer books will be closed from August 21st to September 3d.

Bullion-Beck & Champion Mining Company, Utah, 50c. per share (\$50,000 in all), paid August 6th. Mayflower Gravel Mining Company, California, 10c. per share.

National Lead Company, 1 1/4% on the preferred stock, payable September 15th; transfer books will be closed from August 24th to September 17th. Also 1% on the common stock, payable October 1st. Transfer books will be closed from September 10th to October 2d.

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, dates from Aug. 11 to Aug. 17, and Sales. Includes companies like Biecher, Nev., and Am Flag.

*E-c dividend. †Deal in at New York stock Ex. ‡Unlisted securities. §Assessment paid. Dividend shares sold, 2,230. Non-dividend shares sold, 2,100. Total shares sold, 4,330.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, dates from Aug. 10 to Aug. 16, and Sales. Includes companies like Atlantic, Mich., and Amalgamated.

Dividend shares sold, 3,106. Non-dividend shares sold, 2,119. Total shares sold, 5,225.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Name of Stock, dates from Aug. 11 to Aug. 17, and Sales. Includes Am. Coal, Balt. & Ohio, and others.

Total shares sold, 51,745.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Name of Stock, dates from Aug. 11 to Aug. 17, and Sales. Includes Adams Express, Am. Cotton Oil, and others.

Total shares sold, 429,494.

COLORADO.

Table with columns for Name of Company, dates from Aug. 10 to Aug. 16, and Sales. Includes Alamo, Amly, and others.

Total shares sold, 196,300.

UTAH.

Table with columns for Name of Company, dates from Aug. 10 to Aug. 16, and Sales. Includes Alliance, Anchor, and others.

MARYLAND.

Table with columns for Name of Company, dates from Aug. 10 to Aug. 16, and Sales. Includes Atlantic Coal, Balt. & N. C., and others.

CALIFORNIA.

Table with columns for Name of Stock, dates from Aug. 10 to Aug. 16, and Sales. Includes Alpha, Amalgamated, and others.

FOREIGN.

Table with columns for Name of Stock, dates from Aug. 10 to Aug. 16, and Sales. Includes Alaska Treadwell, Alaska Ter, and others.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Par, Assessments, Dividends, and Name and Location of Company, Capital Stock, Shares, Par, Assessments. It lists various mining companies and their financial details.

G. Gold, S. Silver, L. Lead, C. Copper, B. Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Com. Virginia \$12,330,000. § Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. ¶ Previous to this company's acquiring Northern Bell, that mine paid \$2,400,000 in dividends against \$425,000 in assessments.

Table with columns: COLORADO, Aspen, Aug. 9, Price. Lists various mining stocks like Argentinum-Juninta, Aspen Contact, etc.

Table with columns: Colorado Springs, Aug. 3, Low, Sales. Lists various mining stocks like Cripple Cr'k (gold), Alamo, Anconada Gold, etc.

Table with columns: PENNSYLVANIA, Pittsburgh, Aug. 16, Bid, Asked. Lists various mining stocks like Allegheny County Light, Bridgewater Gas, etc.

Table with columns: MISSOURI, St. Louis, Aug. 14, Bid, Asked. Lists various mining stocks like Adams, American & Nettle, etc.

Table with columns: MONTANA, Helena, Aug. 7, Bid, Asked. Lists various mining stocks like Bald Butte (Mont.), Benton Group, etc.

Table with columns: MINNESOTA, Duluth, Aug. 14, Par, Bid, Ask'd. Lists various mining stocks like Biwabik M. Iron Co., etc.

Table with columns: UNLISTED STOCKS. Lists various mining stocks like Adams Iron Co., Ashland Iron Co., etc.

Table with columns: FOREIGN, Shanghai, China, July 13. Lists various foreign mining stocks like Hong Kong Electric Co., etc.

Table with columns: Paris, France, Aug. 6, Francs. Lists various French mining stocks like Acieries de Creusot, etc.

Table with columns: Acieries de France, etc. Lists various French mining stocks like Acieries de France, Agues Tendras, etc.

Table with columns: ASSESSMENTS, COMPANY, No, Dinqt. in office, Day of sale, Amt. per sh're. Lists various mining companies and their assessment details.

CURRENT PRICES.

Table listing current prices for various commodities like Acid-Acetic, Commercial, Carbonic, etc.

Table listing current prices for various metals and minerals like Cadmium Iodide, Chalk, China Clay, etc.

Table listing current prices for various minerals and chemicals like Mineral Wool, Nitre Cake, Potassium, etc.

Table listing current prices for various metals and minerals like Tin-Crystals, Muriate, etc.

THE RARER METALS.

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

RAILROAD MATTERS.

The C. & O. are now building water troughs in the middle of their tracks between Thurman and Sewell, on the Huntington division, so that engines can take water without making any stops. This will lessen the time of the new F. F. V. train between Cincinnati and New York when these troughs are completed.

The old "Blue Bridge" on the Baltimore & Ohio Railroad over the Patapsco river, just outside of Baltimore, is to be replaced by a new structure. This bridge has been in use about 25 years. The new bridge will be of steel throughout, of the standard triangular truss pattern, 126½ ft. long, 28 ft. wide, and resting on granite abutments. The Concord Iron Works has the contract.

The Denver & Rio Grande Company reports for the year ending June 30th as follows: Gross earnings, \$6,476,043; working expenses, \$3,972,551; net earnings, \$2,503,492; fixed charges, \$2,415,831; surplus, \$87,661. No dividends were paid. As compared with the previous year gross earnings decreased \$2,841,603, or 30.5%; expenses, \$1,309,533, or 24.8%; and net earnings \$1,532,070, or 38%. Mr. E. T. Jeffery, president of the company, has issued a circular thanking the employes of the company for their faithful attitude during the Debs strikes last month.

A French company which built a railroad 164 miles long in Senegal, on the tropical west coast of Africa, sent down six engineers in 1881 to do the preliminary work, and in the first year five of the six were carried off by yellow fever. Notwithstanding, in November, 1882, work was begun with a force of 2,200 Europeans, the laborers being chiefly Italians, who were sent home during the rainy season and worked only six or seven months of the year in Africa, and then lay off between 10 a. m. and 2 p. m. Only 25 of the 2,200 lost their lives. But when the operation of the road began, and men had to work at all hours and in all seasons, they could not be saved. A large number of physicians were provided and frequent vacations granted, but no less than 62% of the original force has been lost by sickness, death, and return to Europe. In 1887 about 8½% of the employees died and 16% had to be sent home—a loss of one-fourth in one year. Hereupon determined efforts were made to train natives for the work, and now out of 700 employees 600 are negroes.

A circular has been issued by Samuel Spencer, president of the Southern Railway Company, announcing that from August 1st the lines of the East Tennessee, Virginia & Georgia, the Charlotte, Columbia & Augusta and of the Columbia & Greenville (not including the Blue Ridge Railroad or the Laurens Railroad), are operated by the Southern Company. The jurisdiction of the following officers will be extended over these lines: A. B. Andrews, second vice-president, at Raleigh, N. C.; William H. Baldwin, Jr., third vice-president, at Washington, D. C.; and Sol Haas, assistant to the president; John M. Culp, traffic manager; W. A. Turk, general passenger agent; George S. Hobbs, auditor; Harrie C. Ansley, acting treasurer, and Joseph P. Minertree, purchasing agent, all at Washington.

From August 1st the lines of the Southern Railway Company are operated in two systems, the Eastern system comprising the Richmond & Danville, the Charlotte, Columbia & Augusta and the Columbia & Greenville railroads, and the Western system including the East Tennessee, Virginia & Georgia and the Knoxville & Ohio. The following new appointments have been made: W. H. Green, general manager of the Eastern system, at Washington, D. C.; C. H. Hudson, general manager of the Western system, at Knoxville, Tenn.; James H. Drake, general freight agent of the Eastern system, at Richmond, Va.; Edwin Fitzgerald, general freight agent of the Western system, at Knoxville, Tenn.; William Hawn, assistant auditor, at Knoxville, and J. N. Mitchell, assistant treasurer, at Knoxville, Tenn. It is reported that the Southern Railway will probably establish its principal machine shops at Greensboro, N. C.; Charlotte, N. C., is also being considered in connection with this matter, it is stated. What effect the proposed establishment of these shops will have on the Manchester (Va.) shops is not stated.

The extension in the northeastern direction of the Imperial Railway of North China has been

completed from Kai Ping as far as Shan Hai Kuan at the end of the great wall. The line was located last spring as far as Ta Ling Ho, 130 miles east of Shan Hai Kuan, but only a portion of the located line can be built this year. About 40 miles will be built on the western end and 20 on the eastern end. The material is landed at Kin Cheu Bay, about 20 miles south of the celebrated city of Kin Cheu. No other railroad project is making any headway now. Apparently the enterprise of taking out American operating officers has failed, as the four Americans who went to China in the railroad service have left. The authorities at Pekin are rather obstructive than otherwise; nevertheless, it is believed that the line will be completed to Ta Ling Ho next year or by the spring of 1896, then the line may be carried on to some point near Moukden and down to Newchwang to the southwest and Kirin to the northeast, as was the original plan. At least 10 years will be needed to do this work at the present rate, and until it is completed it is not likely that any other line, except, perhaps, in Formosa, will be started. This line ought to have a heavy traffic, and the connecting line from Tientsin to Moukden will probably do a good passenger business, as does the line already existing. The passenger rate is astonishingly low, being 0.33c. gold per passenger-mile. The cars are 65 ft. long and carry 100 passengers. Three locomotives from Germany are now at work near Kin Cheu Bay, about 10 miles of track having been laid. These are the first engines to run in Manchuria. The bridge building shops at Shan Hai Kuan were started early in May, building 60-ft. plate girders and 100-ft. trusses for bridges for the line beyond the great wall. These shops are equipped with Tweddell's hydraulic machines, and it is said that bridge material can be turned out cheaper than it can be procured from Europe. The steel is mostly from Scotland. The Lan Ho bridge was completed five months ago. It is 2,260 ft. long and 35 ft. above the water level.

REDUCED RATES TO WASHINGTON, D. C.

Grand Encampment of the Knights of Pythias of the World.

The biennial encampment of the Supreme Lodge and grand encampment of the Knights of Pythias of the world will be held at the National Capital, August 27th to September 5th. For this occasion the Baltimore & Ohio Railroad Co. will sell round trip tickets at reduced rates from all points on its lines east of the Ohio River, August 23d to 28th inclusive, valid for return trip until September 6th; a further extension of time to September 15th can be secured, provided the ticket is deposited with the joint agent at Washington, D. C., on or before September 6th. The rate from Philadelphia will be \$4.00, Pittsburgh, \$8.00; Cumberland, \$4.55, and correspondingly low rates from all other stations.

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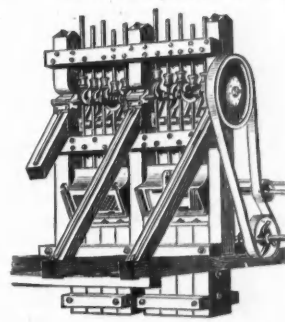
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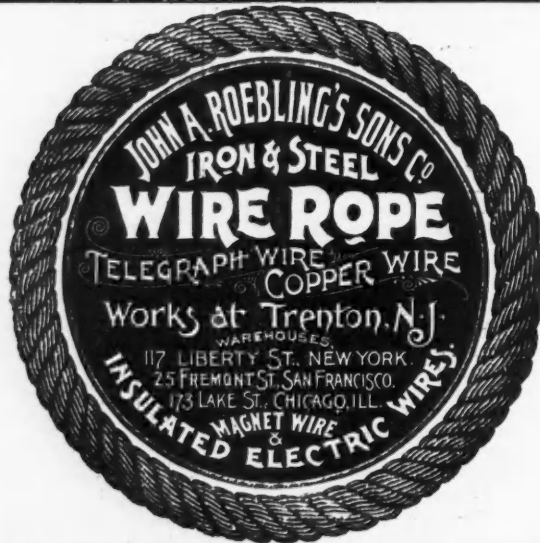
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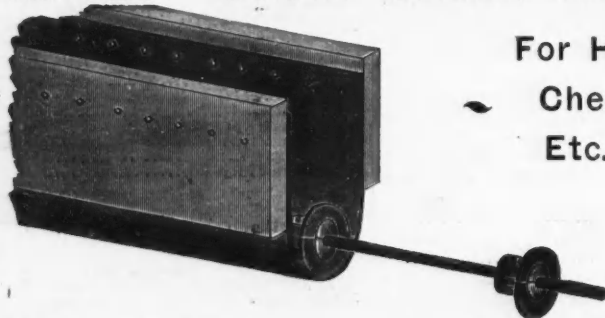


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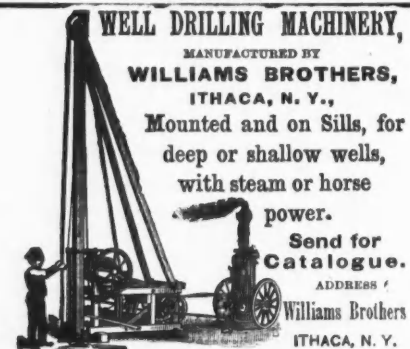
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Furlong, W. H.
Gooding, F. W.
Hanna, G. H.
Hase, E.
Hammond, John Hays.
Hampton, W. Huntley.
Hardman, John E.
Hastings, John B.
Hedburg, Eric.
Hoffman, Octocar.
Hollibaugh, J. R.
Hooker & Lawrence.
Howard, Chas. M.
Hunt & Overton.
Inne, F. W.
Jennings, R. P.
Jouling & Escobar.
Jones & Jones.
Engineers' Instruments
Brandt's Sons.
Bullock, M. C. Mfg. Co.
Gurley, W. & L. A.
Engines
Armstrong Brothers.
Bucyrus Mfg. Co.
Bullock, M. C. Mfg. Co.
Fraser & Chalmers.
Machine Hardware Co.
Scoville Iron Works.
Stilwell-Bierce & Smith-Valle Co.
Excavators
Bucyrus Steam Shovel & Dredge Co.
Southern & Co.
Fans, Steam
Cole, Wm. E.
Fertilizer Machinery
Poole, R., & Son Co.
Fibre Conduit ... Fibre Conduit Co.
Fire-Frises and Cans
Garden City Sand Co.
Flour Mill Machinery
Poole, R., & Son Co.
Fluor spar ... Obermayer Co.
Fly Wheels ... Poole, R., & Son Co.
Founders
Fraser & Chalmers. | Poole, R., & Son Co.
Obermayer Co.
Foundry Cranes ... Obermayer Co.
Foundry Supplies ... Obermayer Co.
Friction Clutches ... Poole, R., & Son Co.
Fuel Oil ... Star Burner Co.
Furnaces
Hoskins, Wm.
Moore, S. I., & Son Co. (See Machinery.)
Fuses, Powder
Climax Fuse Co.
Gas Engine
Webber Gas & Gasoline Engine Co.
Gas Works
Pollock, Wm., B. & Co. | Wood, R. D. & C.

Gauges, Recording, Etc.
Allen, Chas. A. | Bristol Mfg. Co.
Gearing
Fraser & Chalmers. | Poole, R., & Son Co.
Grain Elevators
Poole, R., & Son Co.
Grease, Graphite, Etc.
Dixon, Jos., Crucible Co.
Hangers
Poole, R., & Son Co.
Heavy Machinery
Fraser & Chalmers. | Poole, R., & Son Co.
Hopper Trucks
Mueller Mfg. Co.
Hose, Rubber, Etc.
Allen, Chas. A.
Mineralized Rubber Co.
New York Belting & Packing Co., Ltd.
Hydro-Pneumatics
Young Lock Nut Co.
Inspection and Tests
Hunt, The Robert W. Co.
Insulated Wires and Cables
Okonite Co., Ltd., The
Insurance Companies
Hartford Steam Boiler Inspect'n and Ins. Co.
Mutual Life Insurance Co.
Iron Castings
Poole, R., & Son Co.
Iron Pipes
Obermayer Co.
Lamps, Miners'
Stieren, Wm. E.
Lead, White, Machinery
Poole, R., & Son Co.
Locomotives
General Electric Co. | Porter, H. K., & Co.
Hunt, C. W. Co. | Thomson - Houston International Co.
Machine Moulded Gearing
Poole, R., & Son Co.
Machinery
Fraser & Chalmers. | Poole, R., & Son Co.
Magnesia Covering
Keasbey & Mattison Co.
Marine Railways
Poole, R., & Son Co.
Mining Machinery, and Other Machinery
Etna Fly, & Mach. Co.
Alis, Edw. P., & Co.
Amer. Mining & Milling Machinery Co.
Armstrong Brothers.
Beckett Foundry & Machine Co.
Bostman, J. F.
Boston Ore Mach'ry Co.
Buckeye Engine Co.
Calkins, W. C., Mfg. Co.
Carpenter, Geo. B., & Co.
Colorado Iron Works.
Exeter Mach. Wks. Co.
Fraser & Chalmers.
Freeman Fdy. & M. Wk. Co.
Grimm & Wede. Co.
Hendrie & Bolthoff Mfg. Co.
Jeffrey Mfg. Co.
Jessop, W., & Sons, Ltd.
Krupp, F., & Co.
Kerr, Mark B.
Lau, J. H., & Co.
Mech'l Gold Extr. Co.
Mecklenburg Jr. Wks. Co.
Metal Dealers
Abbott, Wheelock & Co.
American Metal Co.
Am. Zinc-Lead Co.
Baker & Co.
Bath, Henry & Son.
Donaldson, A. M., & Co.
Kureks Co.
Kureks Co.
Kureks Co.
Metalurgical Works and Ore Purchasing Processes
Orford Copper Co.
Penn. Salt Mfg. Co.
Ricketts & Banks.
Russell Process Co.
St. Louis Sampling & Testing Works.
State Ore Sampling Co.
Waburn-Swenson Mfg. Co.
Western Plating & Mfg. Co.
Mine Cars
Hunt, C. W., Co.
Mine and Specimens
Helstead, J. C.
Mining and Land Companies
Amer. Devel. & Mfg. Co.
Austin, G. M., & Co.
Boston & Mont. M. Co.
Butte & Boston Mfg. Co.
Central Mfg. Co.
Copper Queen Mfg. Co.
Detroit Copper Mfg. Co.
Garden City Sand Co.
Nickel
Canadian Copper Co.
Nuts, Lock
Young Lock Nut Co.
Ore Cars
Star Burner Co.
Ore Cars
Donaldson, A. M., & Co.
Fraser & Chalmers.
Ore Testing Works
Donaldson, A. M., & Co.
Ricketts & Banks.
State Ore Sampling Co.
Packing and Pipe Coverings
Mineralized Rub. Co.
New York Belting & Packing Co., Ltd.
Wyckoff & Son, A.
Perforated Metals
Altechson, R., Perf. Metal Co.
Fraser & Chalmers.
Harrington & King Perforating Co.
Hendrick Mfg. Co.
Periodicals
Arms and Explosives. | Iron & Coal Trades
Australian Mfg. Stand'd. | Electrical Engineer.
Electrical Plant & Jour. of Assoc. of En-
gineering Societies.
Financial Times. | Mining Journal.
Phosphates
Trenton, Paul C.
Phosphor-Bronze
Phosphor-Bronze Smelting Co.
Pile Drivers
Bucyrus Steam Shovel and Dredge Co.
Pipes
Poole, Wm. B., & Co. | Wyckoff & Sons, A.
Planned Gearing
Poole, R., & Son Co.
Platinum
Baker & Co.
Plumbers - East India
Obermayer Co.
Portland Cement
Atlas Cement Co.

Powder
Etna Powder Co.
Lafin & Hand Powder Co.
Publications
Allison's Journal.
Arms & Explosives.
Australian Mining Standard.
El Minero Mexicano.
Pulleys
Poole, R., & Son Co.
Pumps
Etna Fdy. & Mach. Co.
Allen, Chas. A.
Blake, Geo. F., Mfg. Co.
Cameron, A. S., Steam Pump Works.
Epping, 'arp'ter & Co.
Fraser & Chalmers.
Goulds Mfg. Co.
Grootzinger, A., & Sons.
Jensen's Iron Wks.
Quarrying Machines
Bostelmann, L. F.
Ingersoll-Sergeant Rock Drill Co.
Ran Drill Co.
Sullivan Machinery Co.
Union Wire Rope Tramway Co.
Quicklime
Eureka Co.
Railroads
Baltimore & Ohio R.R. | Midland R. R. of Ky.
Baltimore & Annapolis and Equipment |
Carp'ter, Geo. B., & Co. | Porter, H. K., & Co.
Garden City Sand Co. | Robinson & Orr.
Hunt, C. W., Co. | Young Lock Nut Co.
(See Machinery.)
Regulators, Damper, Heat, Etc.
Eddy Valve Co. | Mason Regulator Co.
Lunkenheimer Co.
Rock Drills (See Air Compressor.)
Rolling Mill Machinery
Poole, R., & Son Co.
Rolling
Berlin Iron Bridge Co. | Phelps, Dodge & Co.
Holton Iron & Steel | Pittsburg Bridge Co.
Roofing Co. | Scaife, Wm. B., & Sons.
Pencoyd Bridge and | Youngstown Bridge Co.
Const.
Rope Wheels
Poole, R., & Son Co.
Rubber Goods
New York Belting & Packing Co., Ltd.
Safety Lamps
Wm. E. Stiersa.
Screens
Altechson, R., Perf. metal Co.
Exeter Machine Works Co.
Fraser & Chalmers.
Harrington & King Perforating Co.
(See Machinery.)
Screen Plates
Harrington & King Perforating Co.
Separators
Harrington Safety Boiler Works.
Shafting
Poole, R., & Son Co.
Walbr'n-Swens'n Mfg. Co.
Shoes and Dies
Chrome Steel Works.
Bucyrus Steam Shovel & Dredge Co.
Southern & Co.
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Balsbach, B., & Ref. Co. | Penna. Salt Mfg. Co.
Baltimore Cop'ry Wks. | Refining Works.
Donaldson, A. M., & Co. | Phosphor-Bronze
Kassas City, & Ref. Co. | Smelt. Co.
Mathison Smelting Co.
Orford Copper Co.
Stedman Foundry & Mach. Co.
Wm. E. Cole, Wm. E.
Steel Rails, Castings, Rolls, Drill
Abbott, Wheelock & Co. | Jessop, Wm., & Sons, Ltd.
Bethlehem Iron Co. |
Chrome Steel Works. | Moore, S. L., & Sons Co.
Present Steel Co. | Roberts, A. & P., & Co.
Exeter Machine Wks. | Robinson & Orr.
Garrison, A., Fdry. Co. | Whitney, A., & Sons.
Testing Works. | (See Metal Dealers.)
Poole, Wm. B., & Co. | Scaife, Wm. B., & Sons.
Williams Mfg. Co.
Tapping Machine, Gas Main, Etc.
Mueller Mfg. Co.
Telegraph Wires and Cables
Okonite Co., Ltd., The. | Nassau Elec. Co.
Testing Batteries
The Plate Hoisting Machinery | Poole, R., & Son Co.
Poole, R., & Son Co. | Pratt & Whitney Co.
Tubes
Poole, Wm. B., & Co. | Williams Bros.
Tabling-Rubber
New York Belting and Packing Co., Ltd.
Turbines
James Leffel & Co., The.
Poole, Robt., & Son Co.
Stilwell-Bierce & Smith-Valle Co.
Turbine Water-Wheels
Poole, R., & Son Co.
Valves
Eddy Valve Co. | Lunkenheimer Co.
Jenkins Bros. | Mason Regulator.
Ventilators
Bullock, M. C. Mfg. Co. | Fraser & Chalmers.
Vulcanite Emery Wheels
New York Belting and Packing Co., Ltd.
Washers
Water Pressure Reducers
Mueller Mfg. Co.
Water Pressure Regulators
Mueller, H., Mfg. Co.
Water-Wheels
Poole, R., & Son Co.
Well Drilling Machinery
Bostelmann, L. F.
Penn Diamond Drill & Mfg. Co.
Sullivan Machinery Co.
Williams Bros. | Sheffield Car Co.
Wheels, Car
White Lead Machinery
Poole, R., & Son Co.
Wire Cloth
Altechson, R., Perf. Metal Co.
Harrington & King Perforating Co.
Wire Rope & Wire
Abbott, Wheelock & Co. | Leachen, A., & Sons
Rope Co. | Phelps, Dodge & Co.
Broderick & Bascom | R. B. J. & Sons & Co.
California Wire Wks | Ropesways Synd., Ltd.
Carp'ter, Geo. B., & Co. | Trenton Iron Co.
Cooper, Hewitt & Co. | Williamsport Wire
Hunt, C. W., Co. | Rope Co.
Wire Rope Tramway
Bryant Steam Shovel & Convey. Machine Co.
California Wire Works.
Colorado Iron Works.
Cooper, Hewitt & Co.
Fraser & Chalmers.
Gunt, C. W., Co.
Hendling, J. A. & Sons & Co.
Ropesways Syndicate, Ltd.
Trenton Iron Co.
Vulcan Iron Works.

FREE ADVERTISING.

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

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

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

Positions Vacant.

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

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

1343 WANTED—COMPETENT CHEMIST to make quantitative tests of ores and tailings. Address, stating experience, references and salary expected, **REACTION, ENGINEERING AND MINING JOURNAL.**

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

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

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

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

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

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

Situations Wanted.

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

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

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

METALLURGIST OF WIDE EXPERIENCE in the building and operation of concentrating works, lead and copper smelting works, copper converting works, silver refineries, etc., will be at liberty in a few months to make new engagement. Should like to correspond with any company requiring a superintendent either for the construction of new works or the operation of existing works. Terms very moderate. Address **CONSTRUCTION, ENGINEERING AND MINING JOURNAL.** No. 14,850 ff.

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

CIVIL ENGINEER WANTS POSITION with engineer or contractor; can make all calculations, supervise work, etc.; would accept small salary to commence, if there is chance for permanency; railroad, street, sewer, or building construction. Address **H. H., P. O. Box 1117, New York City.** No. 1682, Sept. 1.

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

MINING ENGINEER REQUIRES A POSI- tion. Twenty years' experience in several countries in mining, milling, assaying and the treatment of refractory gold ores; no objection to go to Australia or Africa; good connection with the principal mining men and capitalists in London, England; will go there to represent any first-class firm in the States. Highest references and testimonials. Terms moderate. Address **PRACTICAL, ENGINEERING AND MINING JOURNAL.** No. 16,819, Sept. 2.

A GERMAN MINING ENGINEER AND chemist wants position. Has 15 years' experience in mining, milling, assaying and surveying. Familiar with treating gold ores. Speaks Spanish. References. Address **MINERAL, ENGINEERING AND MINING JOURNAL.** No. 16,829, Aug. 25.

MAGNETIC CONCENTRATION.—BY ME- chanical engineer with several years' experience in concentrating iron ores. Competent to take entire charge from prospecting to erection and charge of plant. Open for engagement. South preferred. Address **MAGNETIC, ENGINEERING AND MINING JOURNAL.** No. 16,816, e. o. w. Aug. 25.

BY MIDDLE-AGED MARRIED MAN; HAS had years of experience as bookkeeper, special accountant and general office work in manufacturing business; well versed in details of foundry, machine shop and boiler shop work; excellent references. Address "**WELL VERSED, ENGINEERING AND MINING JOURNAL.**" No. 16,835, Sept. 1.

FIRST-CLASS MECHANICAL ENGINEER and draughtsman, expert in steam, hydraulic and general machinery and iron construction, familiar with steel works machinery, mining machinery and plants, wishes responsible situation. Address **T. J. V., 1024 Park avenue, New York.** No. 16, 826, Aug. 25.

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

EXPERIENCED CHEMIST AND ASSAYER. With first-class references, desires a permanent position. Address **D. C. DONEY, Columbus, Ohio.** No. 16,829, Sept. 22.

A GRADUATE OF LEHIGH UNIVERSITY wants position as assistant in a chemical, metallurgical or assaying laboratory, or as instructor of chemistry, metallurgy, assaying or physics in a college or industrial school. Willing to accept small salary for a beginning. Best of references furnished. Address **CHEMIST, ENGINEERING AND MINING JOURNAL.** No. 16,840, Aug. 25.

Contracts Open.

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

ELECTRIC AND GAS LIGHTING.—Tenders addressed to the undersigned will be received by registered post until September 1st, 1894, for the lighting of the streets, avenues, squares and lanes of the city of Toronto with electric light and gas for a period of five years from the 1st of January, 1896. Specifications and forms of tender can be obtained upon application at the office of the Secretary of the Fire Department, Bay Street Fire Hall. **W. T. STEWART, Chairman Committee on Fire and Light, City Clerk's Office, Toronto.**

The Most Successful Process for the Extraction of Gold.
IMPROVED BARREL CHLORINATION.

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

Correspondence solicited.

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

WATER-WORKS.—Sealed bids will be received at the office of the City Clerk of DeKalb, Ill., until September 4th, 1894, for the improvement of the water-works system of said city. The following items will be required: Two high grade boilers; pumping plant for domestic service, including engine, deep well power pump and power service pump; one duplex pump for fire service of one million gallons daily capacity; one half million gallon reservoir; 90 tons of 10 and 12-in. cast iron pipe with special castings; pipelaying, including removal of old pipe. Bids on boilers and machinery will be accepted from manufacturers only. Plans and specifications can be seen, and specifications for boilers, machinery and cast iron pipe, and also general form of contract and proposal, can be obtained at the office of the undersigned. **DANIEL W. MEAD, Consulting Engineer Rockford, Ill.; E. A. PORTER, City Clerk, DeKalb, Ill.**

FUEL.—U. S. SENATE, WASHINGTON, D. C.—Sealed proposals for the following fuel for the U. S. Senate for the fiscal year ending June 30, 1895, will be received at the office of the sergeant-at-arms of the U. S. Senate until the 28th day of August, 1894, viz., 2,000 tons best extra hard white ash anthracite coal, small furnace size, screened and free from all impurities; also 15 tons of said coal, chestnut size; also 35 tons of Lee white ash coal free from all impurities, stove size; also 75 cords of best hickory wood, cut in three pieces, straight, free from knots and split to medium size; also 150 cords of best split pine wood, straight clean and free from knots; 1,000 bushels best coke; all to be inspected, weighed or measured, sawed, split and stored in the vaults of the Senate wing of the U. S. Capitol, which are opened to the inspection of bidders, at the expense of the contractor; all to be delivered and stored at such times and in such quantities as may be ordered by the undersigned. The right to reweigh the coal or remeasure the wood at the contractor's expense, also to require and take a greater or less quantity than that stated, not exceeding 50 per cent, in any case, of any of the above items, at the prices proposed and accepted, also to reject any or all proposals, or to accept or reject proposals for any of the above items, is reserved by the undersigned. Bids should be endorsed "Proposals for Fuel," and addressed to the Sergeant-at-Arms U. S. Senate. **R. J. BRIGHT, Sergeant-at-Arms U. S. Senate.**

DREDGING.—Bureau of Yards and Docks, Navy Department, Washington, D. C.—Sealed proposals, in duplicate, endorsed "Proposals for Dredging at Naval Station, Fort Royal, S. C.," will be received at this Bureau until Aug. 29, 1894, and publicly opened immediately thereafter. Specifications and blank forms of proposals will be forwarded upon application to the commanding officer of said naval station or to the Bureau. Bidders are expected to fully inform themselves of the character of the work required by visiting the station, where plans may be examined and all desired information obtained. Responsible security will be required for the faithful performance of the contract and the right is reserved to reject any or all proposals not deemed advantageous to the Government and to waive defects. A bond for the sum of \$3,600 must accompany bids for the work. **F. O. MATTHEWS, Chief of Bureau of Yards and Docks.**

WATER-WORKS.—Cedar Rapids, Mich.—Pro- posals are wanted until August 28th for the construction of water-works. Address **E. L. SARGENT, Village Clerk.**

WATER PIPE AND PUMPING PLANT.— Honolulu, Hawaiian Islands—Sealed tenders will be received at the office of the Minister of the Interior until September 1st for water pipe and pumping plant. Specifications may be seen at the office of the superintendent of public water-works in Honolulu and at the offices of the Hawaiian Consuls General in San Francisco and in New York. The Minister of the Interior does not bind himself to accept the lowest or any bid. **JAS. A. KING, Minister of the Interior.**

CANAL WORK.—U. S. Engineer Office, 2258 Wabash avenue, Chicago, Ill.—Sealed proposals, in triplicate, for constructing four miles or less of the eastern section of the Illinois and Mississippi Canal, between Mile 0 and Mile 4, near Bureau Junction, Ill., and for excavating the lock pits and constructing the foundations for four locks, will be received here until August 27th, 1894, and then publicly opened. All information furnished on application here or to Assistant Engineer James C. Long, Tiskilwa, Ill. **W. L. MARSHALL, Captain Corps of Engineers.**

Continued on page 19.

CHLORINE LIQUID
For Extraction of Gold.
FOR SALE BY
WM. PICKHARDT & KUTTROFF,
98 LIBERTY STREET, NEW YORK.

**THE GOLD AND SILVER
EXTRACTION COMPANY**

TRADE MARK.

OF AMERICA,
LIMITED.



MacARTHUR-FORREST

Process.

CAPITAL,

£110,000 Sterling.

TO MINEOWNERS and others having Refractory Gold and Silver ores hitherto untreatable at a profit, the MacArthur-Forrest (Patent) Process of gold and silver extraction offers a solution of the difficulty.

Advisory Board in the United States: THOMAS W. GOAD, Mgr. HUGH BUTLER, Atty. JOHN F. BELL. P. GEORGE GOW. DENVER, COLO.

OFFICE: McPhee Building, - Denver, Colo.

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We own and offer for sale, in car load lots, 700 tons of selected second-hand 25 lb.

STEEL "T" RAILS

and Spikes, bolts and splice bars for same, also several frogs. These rails are at Lake City, Mich., and are in good condition for relaying.

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

DOUBLE CORLISS CONDENSING ENGINE. 600 H. P.; one 1-in. by 42-in. Corliss engine, 125 H. P.; double automatic engine, 250 H. P.; two 100-H. P. Phoenix automatic compound engines, 45 and 5 H. P.; Westinghouse engine, one 80 H. P. Beck engine, one 7 x 7 Southwark automatic engine, one 4-H. P. Otto gas engine, 100, 200, 300 and 500-H. P. feed-water heaters, 30 to 100 H. P. return tubulars, 70-H. P. Locomotive, 60-H. P. vertical boilers, good for 100 pounds. FRANK TOOMEY, Office 131 N. 3d St., Philadelphia, Pa. Warehouses, 974 to 980 Beach Street, 159 to 161 Canal Street.

FOR SALE.

A New Steam Dredge,

Built by Marlon Steam Shovel Company; capacity of dipper, one cubic yard; daily capacity of dredge, 600 to 900 cubic yards per 10 hours. Also 5 1/2-ton Locomotive and 15 side-dump cars of two cubic yards capacity, 36-in. gauge; together with about 5,000 ft. 16-lb. iron rail.

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

Address L., P. O. Box 542 Syracuse, N. Y.

BARGAINS IN FURNITURE.

Several flat-top black walnut and mahogany desks, black walnut, cane-seated arm chairs, for sale. Address

SCIENTIFIC PUBLISHING CO., 253 Broadway, New York.

A GREAT BARGAIN.

One A. Cutler & Son roll-top, 60-inch mahogany desk, in first-class condition, for sale. Address

SCIENTIFIC PUBLISHING CO., 253 Broadway, New York.

FOR SALE.

One Ingersoll Coal Cutting Machine; one Jeffrey Power Drill; one Ingersoll and one Sergeant Rock Drill; one 16-H. P. Vertical Engine; one 60-H. P. Horizontal Engine; two Cameron Pumps; one 9-in. Cornish Pump, Pipe and Gearing; one Frue Vanner, some shafting and Pulleys; one 8-in. by 10-in. Exhauster.

T. W. HOOPER, Secretary, 21 So. Gay St., Baltimore, Md.

BARGAINS HERE.

Nos. 1, 2, 5 and 6 Roots' Blowers. 24-in. x 25 ft. bed Engine Lathes. All in first-class order and at low prices. Also other Machinery and Supplies.

COOKE & CO., 63 & 165 Washington St., New York. Mention this paper.

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

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

Contracts Open

Continued from page 18.

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

SEWERS.—Sealed proposals will be received until September 5th, 1894, by the Common Council of the city of Plainfield, N. J., at the Council Chamber, No. 109 Park avenue, in the city of Plainfield, for doing the work and furnishing the materials in the construction of such portion of the sewer as provided for in the plans and specifications now on file in the office of the City Clerk, No. 109 Park avenue, Plainfield, N. J. Each proposal must be accompanied by a certified check for \$1,000, payable to the Treasurer of the city of Plainfield. The Engineer's estimate of the quantities of material required, and the work to be done, is approximately as follows: 10 feet 24-inch pipe sewer, 3,780 feet 18-inch pipe sewer, 6,130 feet 15-inch pipe sewer, 6,570 feet 12-inch pipe sewer, 1,085 feet 10-inch pipe sewer, 9,910 feet 8-inch pipe sewer, 960 Y-branches, 67 manholes, 26 drop connections at manholes, 25 lampholes, 2 150-gall. flush tanks, 1 1,000-gall. flush tank, 300 extension connections on Y-branches, 5,000 feet tile underdrains. Duplicate plans may be examined, and forms of proposals, specifications, contract, bond, etc., may be obtained at the office of the Engineer, No. 109 Park avenue, Plainfield, N. J. All proposals must be indorsed "Proposals for Sewers," JAMES T. MACMURRAY, City Clerk.

WATER-WORKS.—Sealed proposals will be received by the Board of Water Commissioners of the Village of Hamilton, until September 6th, 1894, for the construction of water-works. The works will consist in general of about seven miles of cast iron mains, with valves, hydrants, valve boxes and special castings, a tile intake, pumping station, pumps, boilers, gravity filters, water tower and other appurtenances. Bids will be received for certain separate portions of the work. Plans can be seen after August 31st, 1894, at the office of the Board of Water Commissioners at Hamilton, or at the office of the engineers, and specifications obtained from James M. Taylor, Secretary of the Board. Bids must be sealed and addressed to James M. Taylor, Secretary of the Board of Water Commissioners, Hamilton, N. Y., and marked on outside of envelope enclosing them, "Proposals for Water-Works," WM. M. WEST, President; JAMES M. TAYLOR, Secretary; MELVIN TRIPP, Treasurer, THE STANWIX ENGINEERING COMPANY, Rome, N. Y., Engineers.

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

ELECTRIC LIGHT PLANT.—Tenders will be received by registered post only, addressed to Ald. W. T. Stewart, Chairman Committee on Fire and Light, Toronto, until the 1st of September, 1894, for the installation of a complete electric light plant for the city of Toronto, Ont. Separate tenders will be received for the various portions of the work, viz.: 1. Engine equipment, 2. Counter shaft and pulleys, 3. Belting, 4. Boilers, 5. Pumps and steam piping, 6. Economizers, 7. Dynamos and station, electrical apparatus, 8. Arc lamps, 9. Poles and overhead circuits, 10. Mast arms and insulators. Plans and specifications may be seen and forms of tenders obtained at the office of the City Engineer. Specifications for items Nos. 2, 3, 5 and 6 may be withheld until balance of apparatus is decided upon. A deposit in the form of a marked check, payable to the order of the City Treasurer, for the sum of 2 1/2 per cent on the value of the work tendered for, must accompany each and every tender. W. T. STEWART, Chairman Committee on Fire and Light, Committee Room, Toronto.

PUMPING ENGINES AND BOILERS.—Office of the Commissioner of Public Works, City Hall, Providence, R. I.—Plan and proposals are invited at this office until September 1st, for furnishing to the city of Providence three pumping engines, with boilers, for raising sewage from the outfall sewer in Allen's Avenue to a discharging sewer in Ernest street, under the following conditions: Each engine to deliver from 12 to 36 million gallons in 24 hours on an average lift of about 27 ft., but varying from 26 to 34 ft., without greatly decreasing its duty under extreme conditions. The elevation of the floors of engine house and boiler house to be not lower than 22 ft. above low water in the pump well nor higher than 25 ft. above said level, but the pumps may be set lower. The plant is to have complete connections and equipments ready to run permanently. Further information will be given by the City Engineer. Each bid must be accompanied by a properly certified check for the sum of \$1,000, payable to the undersigned, which check will be returned to the bidder unless forfeited by the abandonment of the proposal. A satisfactory bond for a sum equal to one-third of the amount of the contract will be required for the faithful performance of the contract. ROBERT E. SMITH, Commissioner of Public Works.

DISTRIBUTING RESERVOIR.—Sealed proposals will be received at the office of the Cambridge Water Board, City Hall, Cambridge, Mass., until Aug. 31, 1894, for constructing a distributing reservoir at Payson Park, in the town of Belmont, Mass., and at that time and place will be publicly opened and read. The reservoir will be about seven hundred and fifty (750) ft. long, about five hundred (500) ft. wide, about twenty-five (25) ft. deep, with a capacity of about forty million (40,000,000) gallons. It will be constructed largely of earth, with puddle or concrete lining, parting wall, gate chamber and fixtures for controlling the flow of water, etc. The bids will be compared on the basis of the Engineer's approximate estimate of quantities, which will be furnished with copies of the specifications. Plans and specifications can be obtained only by application in person at the office of the City Engineer. Proposals to be addressed to the Cambridge Water Board and indorsed, "Proposal for Distributing Reservoir at Payson Park." L. M. HASTINGS, City Engineer.

ELECTRIC SUPPLIES.—Bids will be received by the construction committee of the underground system of police and fire alarm telegraph and police patrol until September 1st, for a system of electrical supply conduits of any of the four following types: 1. creosoted wood; 2. treated wrought-iron pipe, laid in concrete; 3. cement-lined tubes, laid in concrete; 4. terra cotta tubes, laid in concrete. Proposals should be addressed to the committee and must contain a certified check for \$1,000, made payable to the mayor and city council of Baltimore. NICHOLAS S. HILL, Jr., Engineer, 508 Equitable Building.

WATER WORKS.—Rollingston, Minn.—The village council invites proposals for constructing a water-works plant, in accordance with plans and specifications to be seen at the office of the clerk. Sealed proposals for all or any part of the work, addressed to the undersigned, will be received until August 14th. Proposals must be made on blank forms furnished on application to the village clerk, and must be accompanied by a certified bank check, payable to the village of Rollingston, for a sum equal to 10 per cent. of the amount of the proposal. JOHN KOHNER, City Clerk.

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

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