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CONTENTS.

Table listing articles and their page numbers: The Cyanide Process in South Africa... 491, Steel Rail Prices... 491, Silver Miners and Iron Miners... 491, The Bendigo District, Australia... 491, Pig Iron Production... 491, The English Coal Troubles... 491, Coke Sweating... 491, A Suspicious Circular... 491, British Iron and Steel Production... 492, The Labor Question in the Rocky Mountains... 492, New Publications... 493, Books Received... 493, Boiler Awards at Chicago... 493, Coke Sweating... W. N. Page 493, Use of Plain English in Geological Discussions... W. R. Ingalls 494, Iron Ores in Great Britain... 494, * The Michigan Mineral Exhibit at Chicago... S. Brady 495, * Mining at the Columbian Exposition... 497, Abstracts of Official Reports... 497, The Waste of Heat in Iron Smelting... Sir Lowthian Bell 498, A Visit to the Pyrites Mines of Spain... E. D. Peters, Jr. 498, Treating Sulphide Ores at Broken Hill, N. S. W... T. J. Greenway 499, * The New Shops of the Bucyrus Steam Shovel and Dredge Co... 500, Recent Decisions Affecting the Mining Industry... 501, Patents Issued... 501, Personals, Obituary, Societies, Technical Schools, Industrial... 502, Notes: Blue Rock Salt, 494—Harvey Process in Great Britain, 494—Vanadium, 494—Exports of Tin Plate from the United Kingdom, 494—Aluminum Alloys, 499—Pumice Stone in the Canary Islands, 499—A New Battle-Ship, 501—Steel Coal Barges, 501—Cost of Power Transmission by Electricity, 501—An Australian Meteorite, 501—Production of Manganese in the Caucasus, 501.

* Illustrated.

Table listing regional news and stock prices: MINING NEWS: Washington... 506, West Virginia... 506, Wisconsin... 506, Wyoming... 506, FOREIGN: Br. Columbia... 506, Great Britain... 506, India... 506, New Guinea... 506, New So. Wales... 506, Nova Scotia... 506, Ontario... 506, Queensland... 506, South Africa... 506, Turkey... 506, West Australia... 506, COAL: New York... 507, Buffalo... 507, Chicago... 507, Pittsburg... 507, IRON: New York... 508, Buffalo... 508, Chicago... 508, Philadelphia... 509, Pittsburg... 509, METALS: 509, CHEMICALS AND MINERALS: 510, MINING STOCK: New York... 510, Boston... 511, San Francisco... 511, London... 511, ASSESSMENTS: 514, MINING STOCK TABLES: New York... 512, Boston... 512, San Francisco... 514, Coal Stocks... 514, Colo. Springs... 514, Baltimore... 514, London... 514, Paris... 514, Aspen... 514, St. Louis... 514, Duluth... 514, Denver... 514, Helena... 514, Philadelphia... 514, Pittsburg... 514, CURRENT PRICES: Chemicals... 511, Minerals... 511, Rarer Metals... 511, ADVT. INDEX... 19

THE success of the cyanide process in South Africa, especially in the Witwatersrand mines, has encouraged its trial by other companies in that region who do not acknowledge the validity of the MCARTHUR-FORREST patents. Our London correspondent writes that the Consolidated Gold-fields Company is preparing to put up a cyanide plant at its mines in the Transvaal—and preparing also to fight the African Gold Refining Company, which owns the patents.

THE Steel Rail Association is still quoting the nominal price of rails at \$29 per ton at mill. This is much above actual prices, however, and sales are said to have been made by a Pennsylvania mill at \$24 delivered at tidewater. There is a prospect of a still further reduction; and for the present it is not easy to say what the actual prices are, for rumors of even lower prices are numerous, our Philadelphia correspondent writing that rumor has named prices as low as \$23.50.

THE silver miners of the West have certainly had to suffer severely from the panic, and they have not left the rest of the world in ignorance of the fact, as every one knows; but the iron ore miners of Michigan and Minnesota have suffered in silence a much heavier blow than their silver brethren. The production of iron ore this year will be only about one-half that of last year, and wages, which were then about \$2.75 for miners, are now down to \$1.50 per day for miners and \$1 for other labor—a reduction all around of more than 40 per cent.

THE district of Bendigo, one of the oldest gold producers in Australia, continues to show excellent results from its mines. In 1892 the total output of the district was 202,165 ounces of gold, an increase of over 30 per cent. as compared with 1891. During the present year the production has also been large, and for the eight months ending with August amounted to 134,666 ounces of gold, indicating a total for the present year fully equal to that of 1892, if not greater. It will be seen that the old district of Bendigo is retaining and increasing its prosperity, in spite of the attractions held out by the Broken Hill and other mines.

THE November reports of the blast furnaces show an increase over October, which, though small in itself, seems to show that the bottom has been reached in the pig iron trade and the corner turned. The change is an increase of three furnaces in the number in blast and of about 6,000 tons in the weekly output. The number of anthracite furnaces remained unchanged, and that of the active charcoal furnaces was diminished by two, but there was an increase of five in the coke furnaces at work, two of them in the Pittsburg district and one each in Alabama, Tennessee and Virginia. An increase may be expected from now on, though it is likely to be slow for some months to come.

A CABLE dispatch from London says that in some districts in England coal has reached the unprecedented price of 60s. or \$15 per ton, and that the price is still going up. The strike of the coal miners, which is still unsettled in spite of the partial resumption of work announced two weeks ago, but which really included only a few mines, threatens to cause widespread distress, not only among the miners and their immediate dependents, but also among the very large class of persons throughout England to whom dear coal means a curtailment in some of the absolute necessities of life. The serious interruption to manufacturing of all kinds caused by the strike will also increase the distress, and the present outlook is for a hard winter.

IN another column our esteemed correspondent Mr. WM. N. PAGE, reports some interesting observations on the sweating of coke. Where coke is covered or shut up in cars and not exposed to the free circulation of air, the formation of water in noticeable quantities results. Our correspondent suggests as an explanation of this phenomenon that hydrogen may be inclosed in the coke and may combine with oxygen of the air to form the water; where the coke is open to the air this combination does not follow the hydrogen passing off too freely to produce noticeable effects. Whether this is the true explanation or not, the very interesting fact mentioned seems to be established, and records of the observations and experience of others would be of interest.

A SUSPICIOUS CIRCULAR.

The "Cripple Creek Mining and Development Company," whose offices are in Denver and whose officers are F. E. KEARNEY, president; W. E. ALEXANDER, treasurer, and W. HOGARTH, secretary, is now scattering attractive looking little prospectuses liberally in New York and vicinity, not among the offices of business men and large investors, but among the residences where people who may be supposed to have small surpluses to invest are likely to be found; and in every case which has come to our notice these circulars have been directed to women. The prospectus is brief, containing some general statements as to the Cripple Creek district and then going on to say: "We honestly believe that the two gold claims we now have will strike pay ore before we are 100 feet deep. Ore taken from the openings on this property runs all the way from \$7 at the sur-

face to \$30 at 60 feet. The veins are about 6 feet in width, and get wider as depth is reached, as do all other veins in this district!"

It will be observed that all the glittering prospects offered rest, not on any actual work done, but on the "honest belief" of its officers. The whole thing has an old familiar sound, and the feeling of recognition is further increased by an accompanying circular, printed in imitation of a typewritten letter and making the recipient the following seductive offer:

"When the hard times set in the owners of these gold claims who were poor men were obliged to stop work, but feeling sure that they had a good thing they have made a stock company of it and donated about half their stock to be sold to carry on the work of development. Owing to the tightness of the money market they have decided that the better course is to offer small shares to the public on easy terms rather than try to sell in large blocks, and make the following offer:

"For the purpose of raising money to carry on the work of development without stop we will take your subscription for 25 shares of stock for \$12.50, payable \$1 a month. If, at the end of six months, we are not in ore that will justify dividends large enough to pay the \$1 a month from that time on without calling on you we will forward you the full 25 shares, and you will then own them and owe us nothing, and the work will continue. Of course we could not make this offer if we were not reasonably sure of striking pay ore before that time; but being, as they are, extensions of the Deerhorn and Summit mines, which are now shipping and paying large dividends, we feel that we are safe in doing so. We had a clean-cut offer for our entire property, but rather than have it fall into the hands of capitalists we refused it, believing that we could sell enough stock on the above terms to carry it through."

Now there are valuable properties in Cripple Creek, but we do not believe that the "extensions" of the Deerhorn and the Summit are among them. The way in which this business is done is of itself suspicious, and the men who are engineering it are apparently of the class who have in times past brought discredit upon mining enterprises. The "Cripple Creek Mining and Development Company" is evidently a good concern to let alone. No sane business man would approve a concern with such methods; but it is to be feared that the company may gather in a harvest of dollars from innocent women who cannot afford to lose them, as they surely will if the money is sent.

BRITISH IRON AND STEEL PRODUCTION IN 1893.

The production of pig iron in Great Britain for the half year ending June 30th, as stated by the British Iron Trade Association, was 3,665,537 tons, against 2,790,918 tons in the corresponding half of 1892 and 3,712,118 tons in 1891. The output for the half year, therefore, while it shows an increase of 874,619 tons, or 31.3 per cent., over 1892, when production was diminished by the Durham strike, was less than that of 1891 by 46,619 tons, or 1.3 per cent. Of the total production this year, 1,825,120 tons are classed as forge and foundry iron; 1,661,024 tons hematite; 111,912 tons basic, and 67,481 tons spiegeleisen. The stocks of pig iron reported on June 30th amounted to 786,057 tons, as compared with 872,000 tons on December 31st, 1892, and 700,450 tons on June 30th, 1892.

Since June 30th there has been a great change, however, in the iron output, the net reduction in the number of furnaces in blast having been 90 to September 30th. This was partly due to the coal miners' strike making it difficult for many furnaces to procure fuel, but partly also to a diminished demand, since stocks have not decreased to any considerable extent. To put it in another form, the production, which for the first half of the year was at the rate of 7,330,000 tons per year, had on September 30th fallen to a rate of 5,800,000 tons a year, with a prospect of a further decrease. The course of the British pig iron trade has therefore been very nearly like our own, the local cause of a diminished output found in the coal strike having probably hastened, but not produced, the decline in production.

The production of Bessemer steel ingots for the first half of the year, as reported by the same authority, was 784,712 tons, against 649,816 tons in 1892, and 923,005 tons in 1891; the half year thus showing an increase of 134,896 tons, or 20.8 per cent., over last year, but a decrease of 138,293 tons, or 15 per cent., from 1891. Of this year's production 656,774 tons, or 84 per cent., was acid and 127,938 tons, or 16 per cent., basic Bessemer steel. The production of steel rails, 317,305 tons, in the first half of 1893 followed a parallel course to that of ingots, showing a decrease of about 25 per cent. from 1891, but an increase of nearly 50 per cent. over 1892. The conversion of Bessemer steel into finished forms other than rails does not increase in Great Britain, the trade in this respect showing a marked difference from our own, in which structural steel forms a more important part each year.

A notable feature in the British iron trade is the increasing dependence on foreign iron ores. In 1880 the iron ores imported formed 12.7 per cent. of the total used, and this proportion, with some fluctuations from year to year, has upon the whole increased, until in 1892 the imported ores were 25.2 per cent. of the total. For the first eight months of 1893 the importations of iron ore into Great Britain were 2,968,000 tons, against 2,538,000 tons for the corresponding period of 1892. The increase was 430,000 tons, or 17.3 per cent., being less in proportion than that of the iron production; a fact which is partly explained by the almost total stoppage of imports from the south of Spain owing to restrictive quarantine regulations and low prices, and partly by a general decrease in the demand for ores.

THE LABOR QUESTION IN THE ROCKY MOUNTAINS.

The probability that silver will remain at, or about the low level to which it fell, after the action of the India Council on June 26th, which the repeal of the Sherman act seems to assure, makes it necessary for the Rocky Mountain States, whose prosperity has been built up in a great measure on silver mining, to prepare for a new condition of things. The outlook for them at present may seem gloomy, but we are of the opinion that prospects will improve as soon as industry there has readjusted itself to the new basis. It displays ignorance of the enterprise and courage of our Western men to assume, as some of the calamity-mongers did when the price of silver first fell, that the prosperity of the whole Rocky Mountain region is to be wrecked because of the depreciation in the value of one of the metals which it produces. The resources of that part of the country are far too vast and too varied, and the energy of the men who have built Denver, Salt Lake and Helena is too great, to suppose that they are now going to rest inactive. On the contrary, they will turn their attention to gold mining, and to mining silver and lead in a more economical manner, reducing the cost of production in every possible direction.

The wages of labor in the Rocky Mountains have been for a long time disproportionately high, having remained in general at the rates which were established in the early days, when there were few railways and the supplies needed in the mining camps situated far up in the mountains were transported from distant points by the costly agencies of mule teams and pack trains. The cost of living was consequently high, and it was necessary to offer higher wages than in the more easily accessible mining districts of the East. Railroads were soon built into the mountains, however, and expenses were reduced until now they are not much higher, probably not more than 20 per cent., in such places as Leadville, Aspen, Park City and Butte than in Lake Superior and Joplin, Mo.

Wages, on the other hand, never suffered any general reduction, any attempt to do so having been resisted violently by the miners' unions, which acquired such strength that few mine-owners have had the temerity to arouse a struggle with them. Leadville experienced one general strike and would never risk another; in Butte scandalous outrages have been committed in the name of labor, and nothing has been won from its exorbitant demands; while the lawlessness and riots over this question in the Cœur d'Alene in 1892 are of too recent occurrence to have been forgotten.

At the present time miners in Colorado receive from \$3 to \$3.50 per day (eight or ten hours' work), except in Gilpin County, a gold-mining district, where the rate is \$2.50; in Utah, Idaho and Montana \$3.50 per day, and in Nevada \$3 to \$4 per day (the rate on the Comstock being \$4 per day; but this, it is well understood, is the miners' share of the loot of the stockholders, and has nothing to do with economic conditions). Engine-drivers, mechanics, pumpmen and other skilled laborers are paid more than the miners, and ordinary labor (surfacedmen, trammers and shovelers) a little less. The latter class is paid \$2.50 per day (10 hours' work) in Leadville, Col., but in the other States there are no men who receive less than \$3 per day.

The statistics of the Eleventh Census show that 56,434 men engaged in precious metal mining in 1889 received \$43,180,696, or \$765 per man. It should be noted, however, that this average is brought down by the inclusion of the gold miners of Gilpin County, Colo., and the Pacific Coast (California and Oregon), who are paid only \$2.50 per day, except in Bodie, Cal., where there is a miners' union and a \$3 rate.

A reduction in wages has now become a matter of necessity, to which the miners' unions must yield. The policy of many of the mines in summarily closing down three months ago, when they might have been operated at a profit, was primarily to bring this about. In some cases the desired reduction has been effected, but in very many the miners have obstinately resisted. The new scale of wages will probably be not over \$2.50 a day for miners, which is the present rate in Gilpin County, Colo., and in California, as previously stated, and from \$1.50 to \$2 per day for ordinary labor. Even on this basis the rate will be in excess of that paid at some of the Valley smelting works in Colorado. With such a reduction in wages, the cost of mining and smelting, the cost of operating the railways, and, consequently, of transportation and the cost of living, will all be reduced. Silver mining may not be so profitable as it has been, and large fortunes may not be so quickly made in it, but gold mining will be stimulated, and many deposits of low grade ore, which it has not been possible to work at a profit hitherto, will then be opened, while increased attention will be paid to the other mineral resources of the Rocky Mountains which have been hitherto ignored on account of the greater profit to be realized in silver mining. In Colorado there are important deposits of coal, iron, asphaltum and building stone; Utah has copper, asphaltum, sulphur, antimony, onyx and other valuable minerals; Wyoming has natural soda; Nevada has antimony, nickel and borax; while Montana and Idaho, besides being the great lead-producing district of the United States, rival Colorado and the other States in the variety and the extent of their mineral wealth.

NEW PUBLICATIONS.

ASSAYING; IN THREE PARTS. By C. H. Aaron, San Francisco; Dewey & Co. Two volumes. Pages 130 and 161.

This little book, which is now in its second edition, is intended to be a guide for those who have not the requisite knowledge of chemistry to take up the more thorough and comprehensive text books like those of Kerl, Beringer, Brown, Mitchell and others. Mr. Aaron, the author, is a practical metallurgist of long experience, who knew exactly what was needed in the kind of a book that he set out to write, and accomplished his purpose well. The first part of the book treats of the assay of gold and silver ores; the second part takes up the assay of gold and silver bullion; while in the third part methods for the detection and determination of copper, tin, bismuth, antimony, and other metals are more or less fully described. There are many practical hints of value in these little books, which every assayer may read with profit.

MODERN GUNS AND SMOKELESS POWDERS. By Arthur Riggs and James Garvie, London; E. & F. N. Spon; and New York; Spon & Chamberlain. Pages 84; illustrated.

It is not often that one finds within so small a compass so much valuable information, so clearly and concisely stated. The interest in the subject treated is by no means confined to the military profession, and the authors are to be congratulated upon having been able to present them in a manner brief yet comprehensive. After discussing the forces which the modern gun is required to withstand—and from a standpoint not usually employed, without the aid of perplexing mathematical formula—and the conditions necessary to be fulfilled in its construction, the authors give us, in the last half of the volume, the clearest statement of the different modern high explosives, the methods of manufacture, and the machinery therein employed, that we have yet seen. It is very clearly pointed out that the problem at which the military experts are now at work, in connection with new powders, is to find one which, while suitable for the existing type of gun, will, at the same time, give satisfactory results in guns specially designed for its use. That success is near at hand seems almost beyond a doubt.

THE SCIENCE OF MECHANICS: CRITICAL AND HISTORICAL EXPOSITION OF ITS PRINCIPLES. By Dr. Ernest Mach. Translated from the second German edition by T. J. McCormack. Chicago; The Open Court Publishing Company. Pages 534; illustrated. Price \$2.50.

Dr. Mach's book has attained a considerable circulation and reputation in Germany, and is a work showing much originality and extensive research on the part of its author, so that its translation and submission to the American public is a real service to students. It differs from most of the works on mechanics which we have in that it is not a technical treatise on mechanics or their application, but rather a history and exposition of the science of mechanics considered as a department of philosophy. The author says in his preface: "The positive and physical essence of mechanics which makes its chief and highest interest for a student of nature is in existing treatises completely buried and concealed beneath a mass of technical consideration." His object, therefore, has been to trace the history and gradual growth of the science, the methods by which its elementary principles were studied out, and the various lines on which their development has proceeded, disregarding their practical applications, and as much as possible avoiding the use of complicated mathematical demonstrations. In other words, it is not a treatise on mechanics as we ordinarily understand such a work, but a history of the mechanical department of human thought. To most of us this side of the subject is comparatively a new one, and should be an interesting one. Our tendencies are entirely too much to utilitarianism, and it is well to consider sometimes the higher ethical and metaphysical side of a subject as well as its lower and more practical one.

Mr. McCormack seems to have done his work as a translator well, his style being generally clear and free from the long and somewhat involved sentences of the German. The book is well printed and the illustrations are generally good, although some of the diagrams might have been made on a little larger scale to advantage. This is a minor fault, however, and students will find the work well worth reading.

KING'S HANDBOOK OF NEW YORK CITY; AN OUTLINE HISTORY AND DESCRIPTION OF THE AMERICAN METROPOLIS. Planned and Edited by Moses King. Boston, Mass.; Moses King. Pages 1,008; illustrated. Price \$2.

Mr. King has had much experience in the preparation of guide books, and has learned very thoroughly what is required in a work of that kind. To a pretty clear conception of what is needed he has added an evident fondness for his work, and it may be also said that he has chosen his assistants in its preparation with judgment. In this second edition of this work he has given us without doubt the best guide book of New York that has yet been published. It gives a condensed but comprehensive description of the city, which is preceded by an interesting chapter on its earlier history, accompanied by some reprints of old maps and reproductions of old engravings which show very well the early beginnings of the metropolis. Of the succeeding chapters it is hardly possible to give a full review, but they will give the stranger or the visitor a fairly complete account of the city itself, the different methods of reaching it from a distance, its transportation lines, its public buildings, churches and parks, its stores and warehouses, its factories, schools and, finally, its courts and the correctional and charitable institutions. All these are arranged under their appropriate heads and the finding of any information required is made easy by a copious index. Not only will the stranger and wayfarer find this guide convenient, but the resident of the city will doubtless find many things that are new to him, since even the born New Yorker who has not made the city his special study—as very few have time or opportunity to do—will find that there are many nooks and corners which are as strange

to him as they would be to the new comer from Philadelphia or Chatham Four Corners. A prominent feature of the book is its illustrations. These are generally half-tones from photographs taken expressly for the work, and are excellent of their kind; there are over 1,000 of them in all. The book is printed in clear and readable type and is generally an excellent specimen of work. The variety of its contents may be estimated from the fact that the index occupies no less than 24 pages. Of course, no work of this kind can be absolutely complete, but almost the only improvement that could be suggested is a little more information about the new parks in the annexed district—Bronx, Van Courtland, Crotona and Pelham Bay parks—which are destined to be a very important feature in the future, and about which not only visitors but New Yorkers ought to know more than they do.

BOOKS RECEIVED.

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

Poor's Directory of Railway Officials. Eighth Annual Number, 1893. New York; H. V. & H. W. Poor. Pages 512. Price \$3.

The Golden Transvaal. By Henry Longland. London, England; Simpkin, Marshall, Hamilton, Kent & Co. Pages 60; illustrated.

Country Road Construction. By J. H. Striedinger and Otto von Geldern. San Francisco; the Technical Society of the Pacific Coast. Pamphlet, pages 33.

Pennsylvania: Annual Report of the Secretary of Internal Affairs. 1892. Part III, Industrial Statistics. Harrisburg, Pa.; State Printers. Pages 560.

"Calumet-Conglomerate": An Exploration and Discovery Made 1854 1864, By Edwin J. Hurlbert. Ontonagon, Mich.; the "Ontonagon-Miner" Press. Pages 148.

Map of Mashonaland and Matabeleland. By E. G. Mathers, F.G.S. London, England; published by the Compiler. Folding Map, in covers, with introduction, 16 pages.

Tables of Equivalents of Metrical and English Measures, Weights, Etc. with Tables of Areas. By John McGee, C. E. New York; "Engineering News" Publishing Co. Pages 64.

Smoke Abatement: Ordinances and General Reports of the Smoke Commission, City of St. Louis. St. Louis, Mo.; published by the Board of Public Improvements. Pamphlet, 24 pages.

Iowa Geological Survey: Volume I. First Annual Report, 1892, with Accompanying Papers. Dr. Samuel Calvin, State Geologist; Dr. Charles R. Keyes, Assistant. Des Moines, Iowa; published for the Survey. Pages 472; with maps and illustrations.

Annual Report Upon the Improvement of Rivers and Harbors in Southern New Jersey, of Delaware River and Bay and of Waters Tributary Thereto. Major C. W. Raymond, U. S. Engineers, in charge. Washington; Government Printing Office. Pages 64.

Quarterly Report of the Chief of the Bureau of Statistics, Treasury Department, on the Imports, Exports, Immigration and Navigation of the United States for the Three Months ending June 30th, 1893. Washington; Government Printing Office. Pages 184.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

All letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

The Boiler Awards at Chicago.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Below we give copy of a special notice in relation to boilers at the World's Fair, Chicago, which we placed on the front of our boilers during the last few weeks of the Fair:

SPECIAL NOTICE.

"These boilers have received no award. Why? Read! Learn! We were informed that it was the purpose of the jury to make awards on boilers based entirely upon the written statements of the exhibitors of boilers, without tests or any personal knowledge in the possession of said jury concerning the comparative construction, operation, economy or durability of said boilers. We were asked to make such a statement, and were informed that all other exhibitors of boilers had been requested to make a like statement of their claims for the consideration of the Jury of Awards.

"Believing that an award, based on such insufficient knowledge on the part of said jury, could be of no practical value, and, notwithstanding the expense incurred by this company in making an exhibit, we respectfully declined to make any such written statement for the purpose of receiving an award upon our boilers. While we do not in the least envy those who have, upon such knowledge by the jury, been awarded premiums, we are equally content to stand upon the record without an award based on such a knowledge of our goods."

NEW YORK, Nov. 3, 1893.

THE BABCOCK WILCOX COMPANY.

Coke Sweating.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: A series of observations which I have made through a period of 10 years, and with different cokes, has shown that during the hot summer months dry coke, containing not more than 1% of moisture, drawn fresh from the ovens, and loaded directly into tight box cars, without any contact with water on the yard, and in the absence of any rain, will become saturated with water when the car doors are tightly closed, but when slatted and left open no such phenomenon appears. In a car so loaded with coke drawn from a beehive oven at red heat, and with closed doors, at the end of a week water would

be dripping from the bottom of car, and the coke would average from 5% to 10% of water, while in a similar car, loaded at the same time, with the doors left open, all other conditions being the same, the coke contained less than 1% of moisture.

If these conditions are based upon facts, as is indicated by observation, what is the chemical explanation? We know that dry carbon—notably fresh charcoal—possesses the peculiar property of condensing, or quietly combining, oxygen and hydrogen into H_2O ; but while the oxygen is easily accounted for, whence comes the hydrogen? Is it possible that sufficient quantities of this gas may be contained in the cells of the coke, and given up so slowly as to diffuse with the oxygen in a close car, but escape when open? It is more than probable that free hydrogen is bottled in the coke cells, and the harder and denser the cell the longer it is retained; but in the absence of further information upon the subject, such a theory is not entirely satisfactory. On this point the experience of other observers will be of great value to both the manufacturers and consumers of coke. While I cannot say that the sweating does not occur during the winter months, owing to the difference in atmospheric conditions, my attention has been directed more particularly to the hot and dry seasons. A remarkable feature observed is the fact that the moisture contained under such conditions seems to be in excess of the capacity of the coke when simply immersed in water.

A denial of the premises will not be a satisfactory explanation. The phenomenon seems to be well established, though a satisfactory explanation is wanted. When the coke has laid in the yard or in stock for some time, the sweating is less apparent or entirely absent; and this might be taken as evidence of a slow yielding up of hydrogen. Ventilation certainly prevents it, either by carrying off the gas or by the evaporation of the moisture, if formed. In nearly every complaint made of wet coke, investigation showed that the car doors had been closed in transit; and in many instances laboratory tests have evaporated more water than the same coke would absorb when immersed in water for 24 hours. In every case, the gross weight of the car had been increased, but how much of this difference was due to the different scales is uncertain. The subject is one well worth careful investigation, and further observations on this point by others would be of service.

ANSTED, W. Va., October 25, 1893.

WILLIAM N. PAGE.

The Use of Plain English in Geological Discussions.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The plea of Mr. Rickard in your issue of October 14th, for the use of plain English in the discussion of geological questions, deserves support. I am sure that it has met with approval among the plain people in the profession who find it hard to keep up with the new words and phrases brought into the language of geology and the other sciences. I do not mean, of course, the new words devised to define new things, which have been necessary—for instance, in the literature of electricity—but such new words as "idogenous," "xenogenous," "hysteromorphous," and the rest so aptly criticised by Mr. Rickard, which are applied to the classification of well known facts for which simpler and well understood terms could have been used. Words like these, coined from the Greek, are especially objectionable; in the case of words derived from the Latin, it may be said, in defense of them, that they are at least intelligible to the average man, Latin forming a component part of the English language and being commonly studied in our schools; but a Greek word does not so readily convey its meaning. There has gradually been developed a general scientific phraseology, with what may be called dialectic differences for each of the various branches of science, which is unintelligible to the mass of people who speak the English language. Unfortunately, also, it is to be feared that it is sometimes not exactly understood by those who use it. This nomenclature is a sort of professional slang analogous to that of the turf or prize ring, of which some expressions come into common use, but the most remain a mystery to all but the initiated; it is largely an artificial development of scientific students who fancy that their peculiar words and phrases convey a finer shade of meaning than is possible with simple English; and it may be, sometimes, mere pretense to impress the public. The necessity in scientific writing more than any other, however, is accuracy in expression, the production of a true mental picture of the facts described or a full understanding of the argument made. How can this be done better than by simple English, than which no language is more graphic or more forcible. Is not the picture often blurred by the use of involved sentences and pedantic words?

Rudyard Kipling, who is distinguished for terseness and power of expression, tells in "The Finest Story in the World" of an inscription carved by a Greek galley slave on the handle of his oar, which meant in plain English, forcible if not elegant, "I'm beastly tired." A learned professor in the British Museum, to whom the same inscription was referred, translated it thus: "I have been many times overcome with weariness in this particular employment." The professor's translation was unquestionably correct, but what a difference in the picture in the mind of the reader! It is vividness in word-picture that is often of the utmost importance in describing a geological phenomenon, which may be effaced absolutely by the work exposing it. Many valuable facts have been lost forever, because undescribed, which could have been best described in the simple language of those who observed them, while other facts have been sometimes obscured by overwriting.

New York, Oct. 23, 1893.

WALTER RENTON INGALLS.

Blue Rock Salt.—This mineral, according to F. Kreutz ("Anzeiger der Akademie der Wissenschaften zu Krakau," April, 1892, pp. 147-152) owes its color to the presence a blue compound of iron, as is also the case probably with the blue varieties of anhydrite, calcite and celestine.

IRON ORES IN GREAT BRITAIN.*

The most recent returns show that the iron trade of Great Britain is increasingly dependent on imports of iron ore for the supply of the blast furnaces of the principal districts, and the North of England and Scotland are increasingly competing with South Wales for the produce of the mines of Bilbao and the South of Spain. The imports of iron ores into Great Britain for the first eight months of 1893 were 2,968,000 tons, as compared with 2,538,000 for the corresponding period of 1892. The iron ore import trade, however, like the home trade, has been specially subject to adverse influences during the current year. Advices from Cardiff show that owing to the restrictive quarantine regulations at present in force in the South of Spain, and to the absence of general demand at current prices, the import of iron ores from the South of Spain has almost stopped. The imports from Bilbao are, however, continued on a large scale, and the improvements that have recently been made in the harbor and in the navigation of the Nervion River, have facilitated the despatch of cargoes to a considerable extent. One of the most interesting recent events in connection with the development of the ores of Spain is the acquisition by the firm of W. Baird & Co., of the Gartsherrie Works in Scotland, of the Pedrosa Mines, near Seville, whence ores will be shipped by the Guadalquivir River. One of the remarkable features of the recent course of the iron ore industry has been the increase of imports. A full detailed statement shows that in 1880 the total consumption of iron ores in Great Britain was 20,660,000 tons, of which the imported ores were 2,634,000 tons, or 12.7%, while in 1892 the total was 15,091,000 tons, the amount of foreign ores being 3,778,000 tons, or 25.2%. The percentage of foreign ores used to the total consumption for 13 years past is shown in the following table:

1881	12.7	1885	15.4	1889	21.7
1882	12.3	1886	16.9	1890	24.5
1883	16.4	1887	22.3	1891	19.9
1884	15.4	1888	19.6	1892	25.2
1885	14.4				

In 1892, as compared with 1880, 12 years before, there was a falling off in home production of nearly 7,000,000 tons, and a falling off in total consumption to the extent of over 5,000,000 tons. The percentage of our total consumption imported from other countries was larger in 1892 than in any previous year, and was fully 5% above that of the year 1891, when the importation of ores fell off very considerably, in comparison with either of the four previous years.

The decline in the production of iron ores at home has not been special to any particular locality, but has been distributed over nearly the whole of them. The largest amount of decrease has taken place in Cleveland and Scotland, which for a few years past have been using increasing quantities of iron ore, until now they produce over 20% of their make of pig from ores brought from other countries or districts. The present condition of the home iron ore industry appears to be extremely unsatisfactory. Very few mines are yielding profits, and many of them are carrying on operations with more or less considerable loss. This result is largely due to the increased cost of labor, as compared with the level of four years ago, but it is also to some extent affected by the falling off in the production of pig iron.

The Harvey Process in Great Britain.—The British Admiralty has just given out a contract for 1,000 tons of Harveyized armor plates to be used in the construction of the new battle ship "Renown."

Vanadium.—This metal is frequently present in pig iron, and Mr. J. E. Stead reports that British pig iron always contains it. He gives the following results: Clarence pig iron, 0.183%; Cleveland, 0.262%; Holwell, 0.186%; Lincolnshire, 0.168%, the amount being very small.

Exports of Tin Plate from the United Kingdom.—The State Department at Washington has received from Anthony Howells, United States Consul at Cardiff, Wales, a statement prepared by the Cardiff Board of Trade, showing the exports of tin plates and sheets from the United Kingdom during the nine months ended September 30th, 1893. The statement shows that during the period named 212,241 tons of the material, valued at £2,788,585, were shipped to the United States, against 214,527 tons, valued at £2,867,787 in 1892, and 284,316 tons, valued at £4,672,212, in 1891. The total amount exported to all countries in the nine months ended September 20th, 1893, was 301,681 tons, valued at £3,980,218, making the amount exported to the United States alone nearly three-fourths of the total export product.

Some Aluminum Alloys.—In a recent paper on "Ternary Alloys," by C. R. A. Wright—"Proceedings" Royal Society—the author studies alloys containing aluminum in place of the zinc used in the mixtures previously described. The aluminum employed contained considerable quantities of impurity, chiefly silicon and iron, which found their way almost entirely into the lighter alloy. At the temperature of experiment, about 800°, the aluminum alloy contained 1.91% of lead, and the lead alloy 0.07% of aluminum. The composition at the limiting point was: Lead, 19.4; aluminum, 18.0; and tin, 662.6. For mixtures of bismuth, aluminum, and tin at 650°, the composition at the limiting point was 18.6, 25.6, and 55.8%, of these metals, respectively. The bismuth contained 0.28% of aluminum, and the aluminum alloy 2.02% of bismuth when no tin was present. The limiting alloy for aluminum, lead, and silver contained 40% of lead, 1.75% of aluminum, and 58.25% of silver at 870°. No indications of the existence of a compound of aluminum and silver were obtained. At the same temperature the limiting composition for bismuth-aluminum-silver alloys was: Bismuth, 39.5%; aluminum, 2.25%; and silver, 58.25.

*Abstracted from "Bulletin of the British Iron Trade Association."

THE MICHIGAN MINERAL EXHIBIT AT CHICAGO

Written for the Engineering and Mining Journal by Samuel Brady, M. E.

The Michigan mineral exhibit occupied a space in the northeast center of the Mines Building, fronting 60 ft. upon the main center aisle and 40 ft. in depth in the center cross aisle of the building. The position assigned to her was one of honor and a just recognition of her prominence as a mining State. The center corner was decorated by a handsome stone arch, having a frontage of 14 ft. and rising to a height of 25 ft. above the main floor. This was erected wholly of the light red and brown sandstone known as the "Rain Drop," from the quarries of the Portage Quarries Company at Portage Entry and Marquette, and was surmounted by a life-sized and artistic statue of bronze, representing two miners in a reclining position, being crowned by the Goddess Victory. The arch was flanked on the right and left by a fence line, 4 ft. high, running the entire length of the space on both aisles, which was constructed of sandstone furnished by the Detroit Brown Stone Company, whose quarries are located at L'Anse. Surmounting this fence line and upon both sides of the archway stood two handsomely carved brownstone pedestals from the same

These crystals, which are now entirely destroyed by replacement, have left impressions deep in the solid metal, which are remarkably sharp in outline and perfect in form. While examining a large number of masses of copper at Eagle Harbor belonging to the Central Mining Company recently, with a view to selection of representative specimens for the Exposition, the attention of the writer was attracted to this mass by observing one of these crystal impressions penetrating the clear-cut surface of a section cut by the chisel. A closer examination revealed the fact that its surface was scarred in many places by like impressions, some of which were of immense size. This fact is worth the consideration of the student who may seek to fathom the problems of the period during which the formation of the native copper occurred.

Next to the exhibit of the raw material was the system of mining, timbering, hoisting and preliminary crushing which was thoroughly shown by the models of the Tamarack and the Calumet & Hecla mining companies. The former illustrated the method of attack of the Calumet & Hecla lode by a model of the No. 2 combined shaft and rock house, constructed on a scale of 1 in. to 1 ft. Covering a floor space of 6 by 8 ft. and 9 ft. high, it showed a section of a triple compartment shaft, 6 ft. 4 in. by 18 ft. inside the timbers, two



THE MICHIGAN STATE EXHIBIT AT CHICAGO.

quarries, each surmounted by an obelisk of Gypsum, from quarries at Grand Rapids. As visitors entered the portal of the archway they found themselves beneath a handsomely decorated dome, ornamented by a frieze representing the mythical Gnomes of the German miners.

In the native copper display Michigan stood alone, representing every manner of occurrence of this metal, from the productions of the transverse veins represented by two heavy masses and accompanying vein matrix from the old Central Mine to a full assortment in great piles of the different varieties of the amygdaloids and conglomerates from the Huron, Atlantic, Quincy, Franklin, Peninsular, Osceola, Calumet & Hecla, Tamarack, Tamarack, Jr., Centennial, Kearsarge, Wolverine, Allouez and Ahmeek mines. The two masses displayed by the Central Mining Company weighed 8,500 lbs. and 6,200 lbs. respectively. It was particularly this second mass that deserved more than passing notice from the student. The writer of this article, though familiar with the peculiar features of mass copper from his early youth, does not recall ever having seen a specimen containing such deeply marked pseudomorph impressions, demonstrating as it does the pre-existence in the cavity occupied by it of a group of enormous calcite Skalenohedrons of over 3 ft. in length and having a horizontal axis of about 7 in., previous to the precipitation of the copper.

of the compartments utilized for hoisting purposes and one as a timber and pump shaft. The method of hoisting the rock is by a double cage hoist, carrying tram cars to the surface, operated by a 1½-in. steel cable, hemp center, from a straight-faced drum 30 ft. diameter, by means of a duplex Allis engine of the Reynolds-Corliss type, having 42-in. cylinders and 84-in. stroke. This is operated at an average hoisting speed of 3,000 ft. per minute. On reaching the landing the cars are removed from the cage by the lander and placed upon a trolley for transfer to any one of the three shutes in the rock house for dumping. These shutes are arranged to screen the fines into the rock bins below, while the heavy material finds its way to the crusher floor of the rock-house for transfer to one of the five Blake crushers operating there. The size of these crushers are two 18 x 24-in., one 14 x 12-in. and two 9 x 15-in. The discharge from them falls into the rock-bins beneath, the total storage capacity of which is about 1,200 tons. Their contents are discharged into the rock cars by a series of 16 shutes, eight on a side, the flow of rock being regulated by means of a simple lever arm, which raises or lowers at the will of the operator, the hanger plate at the end of the shute, which works upon a strong bolt hinge and is made to serve the double purpose of both gate and shute. The railroad tracks beneath the building are so arranged as to permit the loading of a double line of four

cars at one time, each car having a capacity of 13 tons; these when loaded are transported over the Hancock & Calumet Railroad to the stamp mill on the shore of Torch Lake, some six miles distant. The mill of the Tamarack Company consists of five heads of Allis-Ball direct-acting steam stamps, 20-in. cylinders with a drop of 26 in. They are run under a steam pressure of about 100 lbs. and crush an average of 275 tons per day. One head, however, is operated part of the time upon Kearsarge Mine amygdaloid, of which it crushes 325 tons per diem. The water supply of this mine is pumped from the lake, the mill being equipped with pumps having a total capacity of 11,000,000 gallons per day for that purpose. The mill produces four grades of mineral ranging as follows: No. 1, 93% copper; No. 2, 86%; No. 3, 60%; No. 4, 42%.

An interesting feature of the Tamarack exhibit is a large pile of copper boulders (replacements). They are shown in all sizes from 2 in. to 18 in. in diameter and in various stages of development, from mere shells, much resembling an empty skull, to almost absolute purity. The average return from the smelting of these interesting occurrences in the conglomerate beds is about 65% of pure metallic copper.

The model of the latest type of shaft and rock-house of the Calumet & Hecla Company was a beautiful piece of mechanism, and, like the sectional model of the stamp mill, reflects great credit upon the skill of the constructors. While in the model of the Tamarack Company we have presented the type of shaft and rock-house adapted for what is considered to be the most economical handling of their rock hoisted through a vertical shaft, we have represented in the Calumet model what is considered by them to be the best arranged system possible for the economic handling of their rock raised through an inclined shaft. The type presented is the one the Calumet & Hecla Company has recently constructed over some 10 or 12 of the different shafts, the dimensions of the building being 40 x 60 x 90 ft. high, which is provided with a double trackway beneath for loading cars through the medium of shutes operated by a method similar to that already described in the Tamarack Company's rock-house. The capacity of these tracks is such as to permit of the loading of 10 cars of 6 tons capacity each at one time. The framing of these buildings is all of 14-in. square timber, are braced at every joint with heavy angle iron, so as to render the building as rigid as possible in its construction, and to neutralize to the maximum extent the vibrations caused by the operation of the heavy crushers. Upon being hoisted to the top of the rock-house, the rock is discharged from the 5-ton capacity iron skip which dumps automatically upon the grizzly, screening out the fines and delivering the coarse rock almost into the jaws of the 24 x 36-in. Blake crusher placed at the lower end. The discharge from this crusher is screened, and that portion of the rock failing to pass the second screen is fed to the second or lower crusher, the dimensions of which are 18 x 24 in., through which it finds its way to the rock bins beneath, the storage capacity of which are about 800 tons.

There are now five shafts upon this mine through which men are lowered and hoisted to and from their work. For this purpose a special man-car is used, which is run into place when desired by means of a false rail and is operated by an independent cable and hoisting engine. The cars are arranged with a seating capacity of 36 men, the seats being placed one above another on a series of steps. As the dip of the conglomerate is but 38° with the horizon it can readily be seen that such an arrangement can conveniently be made. The rules of the company forbid the loading of the car beyond the number specified.

From the different rock-houses of the mine, all of which are connected by a railroad, which is the property of the company, the accumulation of material hoisted is transported to the mills upon the shore of Torch Lake, some four or five miles distant. These mills, which are two in number, containing 11 direct acting steam stamps (the Ball-Leavitt type) each and the necessary jigs and slime-tables for concentration, are represented by a beautiful sectional model illustrating part of the milling capacity of the company's mills. The unloading of the cars is accomplished by means of gates in the bottom, permitting the discharge directly into the rock-bins of the mill, over the center of which the line of track is placed. From these bins, which have a total storage capacity of about 800 tons per head, the rock is conveyed by means of shutes to the mortar-boxes of the direct-acting steam stamps. These heads, which have a crushing capacity of from 250 to 275 tons per day, are erected upon foundations as nearly solid as it is possible to make them, the old-time spring timbers having given place to the solid iron bed upon which the anvil and mortar-box rest. This change has resulted in not only an increase of from 10 to 12% in the crushing capacity of the heads, but also in a solution of the annoyance due to the breakage of the spring timbers. The stamp shoes used by this and other companies are manufactured by the founders at Hancock, no shoe having been found that is equal in wearing qualities to the Lake Superior made article. In connection with this subject, it may be mentioned that the Lake Superior Iron Works exhibited two worn-out stamp shoes, the records of which are remarkable. One of these shoes ran 5 days 11 hours, crushing in that time 1,363½ tons of conglomerate small enough to pass a 3-16-in. screen. This was done with a consumption of but 1 lb. of iron to every 3,906 lbs. of rock crushed. Specimen No. 2 shows a record of a loss of 1 lb. of iron to every 3,844 lbs. of rock crushed. These stamps are provided with 20-in. steam cylinders which run at a speed of 102 to 103 blows per minute, and a 24-in. drop. There is a discharge on four sides, and all material is crushed to a fineness sufficient to let it pass the 3-16-in. opening with which the screens are provided. From the mortar-box the discharge is conducted through launders to a central distributing box, from which point it is subdivided into four equal parts for concentration on as many sets of jigs, which are fitted with screens ranging from 10 to 20 mesh. Each head is provided with 34 jigs of two screens each, 28 of which constitute the jiggling plant proper, the other six being used to re-jig

the tails from Nos. 1 and 2 rough screens, for the purpose of catching a further concentration of coarse sand, which has to be recrushed for farther treatment. The tails from Nos. 3 and 4 rough sieves go to waste. Of the 28 main jigs 16 are used for the first rough treatment of the pulp from the start, which is classified for that purpose in the Richards & Coggin separators into five classes, four of which go to the jigs and the fifth overflow from the separator going to the slime tables. The other 12 jigs are the finishers, which treat the hutch-work from the rough machines not sufficiently concentrated for its smelting, the hutch work from the finishers being a finished product ready for the smelter. The fine slimes overflowing at the end of the separator find their way into a settler, where a part of the water is drawn off and the concentrated slimes are lifted by means of a centrifugal pump which carries them through a 3-in. pipe to the farther side of the mill for concentration upon the rotary slime-table. These are now operated as triple deckers, all three upon one vertical shaft, six tables for one head; each, however, treating the slimes separately. They are 16 ft. in diameter, and are given an inclination of 1½-in. per foot. Each table has a capacity for treatment of 20 tons per diem. From the mill the concentrated products are reduced to two grades, carrying about 23% and 84% of metallic copper respectively, and are then sent to the smelting works of the company at Torch Lake or at Lake Linden and Buffalo for further treatment.

Contrasting with this model is the one constructed by the Calumet Company for exhibition at the Centennial Exposition in 1876, representing the type of mill then in use by them. The chief changes to be noted in the lapse of 17 years' time are the increase from four to 22 stamp heads and the greatly increased capacity of the same, which has developed from 150 tons per day to nearly double that quantity; the change from spring timbers to solid foundations for these heads; the abolition of the traditional buddle and the substitution of the rotary tables for the treatment of the slimes.

Capt. James Dunstan, of the Central Mining Company, exhibited a working model of an automatic skip and balance car. It represents a type in use on No. 2 shaft in that mine. The skip, which has a capacity of five tons, is placed as an attachment to a cage hoist above the cage platform, and rests upon a strong hinge working in sockets attached to the cage guides. It is held in its proper vertical position while it is being hoisted by a lever arm, also attached to the guides, which grip strong pins fastened securely to the sides of the skip, and is held in place by means of a strong spiral spring attached to the lever arms, drawing the same fairly down upon the pins. Upon reaching its proper position for dumping, the lever arms come in contact with catches placed upon the sides of the shaft, which release their hold upon the skip and allow it to fall into its proper position for dumping by force of gravity. The reversing of the engine and lowering of the cage throw it again into its proper vertical position where it is caught and held by the lever arm above mentioned.

The exhibit of refined copper of the Calumet & Hecla Mining Company consists of a series of piles of wire bars, round an octagon cake, square cake and ingot, ornamentally placed upon a platform and the whole surrounded with a fence line of wire bars 54¼-in. long, supported upon a series of solid copper cylinders 9 in. in diameter and 20 in. high, serving as posts. The complete weight of the metal shown in this exhibit is about 30 tons. In point of size the cake copper is somewhat phenomenal, the largest piece being 45 in. square and weighing 3,658 pounds. To round out the copper display as a whole and illustrating the completeness of the facilities upon Lake Superior for the treatment of the output of our mines, the Tamarack-Osceola Copper Rolling Mill Company exhibit a cone of copper wire some 16 ft. in height, the largest spool at the base being wound with three miles of electrically welded "0" (0.325) wire; also a series of different sized samples of sheet copper, arranged cylindrically one above another to about a similar height.

In iron, the production of which ranks first in value with all material raised within the State, the display is a creditable one, comprising as it does some 75 selections of ores from 60 actively producing mines upon the Marquette, Menominee and Gogebic ranges. To each sample, which is shown in generous quantity, is attached an analysis demonstrating its value as a Bessemer or non-Bessemer ore. The old Republic, formerly known as the Calumet & Hecla of the iron country, comes to the front with two specimens of specular slate ore, the aggregate weight of the two blocks being 10,350 lbs. The Champion has a fine specimen of specular weighing about two tons, while the representation of the various grades of soft hematites from the different ranges is complete. The Cleveland Cliffs Iron Company had models of the cross-sections of the Lake shaft soft ore mine and the Cliff shaft hard ore mine, which daily attracted much attention. The model of the Lake shaft presented a cross-section 750 ft. horizontal length, and a vertical height of 500 ft., through the basin-shaped trough beneath the surface of Lake Angeline, illustrating the method of attack by inclined shaft, the dip-shape and thickness of the ore body, the system of mining and timbering in square sets and the thickness and shape of the overlying beds of Jasper and the underlying bed of chloritic schist. The whole is constructed upon a scale of 1 in. to 4 ft. It is placed back to back with a model of the Cliff shaft hard ore mine, which presented a cross-section of about the same depth, but of somewhat greater length than that shown in the Lake shaft model. It also represents the foldings and contact rocks of the ore body of that mine, the method of attack through the medium of a vertical shaft, location of drifts from the same, and method of mining and supporting the ground by means of pillars in place of timbers; though to the ordinary observer it is not as attractive a piece of work as its companion, it is to the student of fully as much interest. The space occupied by these models is about 4 x 7 ft. and 10 ft. high. As illustrating the facilities for the rapid handling of the iron ores shipped from the port of Marquette and the method employed in loading the same, the Duluth, South Shore & Atlantic Railroad Company exhibited a sectional

model of the No. 4 ore dock at that point. It has proved to be of special interest to many foreigners who were unfamiliar with our methods of ore handling. As a detailed description of this dock is to be found in the files of the "Engineering and Mining Journal" of January 10th and 17th, 1891, it is unnecessary further to describe its construction than to state that it has, since its construction, fulfilled the expectations of its builders in the dispatch afforded vessels in loading. To illustrate this I may mention the loading of the following named steamers and the time required: "Selwyn Eddy," 3,200 tons soft ore in 9 hours 30 minutes; "Pontiac," 2,400 tons hard ore in 1 hour 40 minutes; "Castalia," 2,300 tons hard ore in 1 hour 30 minutes; "Joliet," 2,100 tons hard ore in 1 hour 10 minutes. This is one of four great docks owned by the company at Marquette, one of them, however, being now out of use. The storage capacity of the three is from 80,000 to 82,000 long tons of hard ore.

The last feature of the iron country display to be mentioned is the beautiful glass model of the Aragon mines, upon the Menominee Range. This is the work of Mr. Per Larsen, and shows well the position of the ore bodies in relation to the overlying and underlying rocks, and the folds and warpings of the formation. To complete the iron exhibit a valuable geological cross-section map, the work of Mr. James Jopling, of Marquette, representing some six miles in length, across the Ishpeming ore basin, with accompanying rock specimens, has been prepared, and in addition thereto a most complete collection of the ores and associate rocks from nearly every mine in Marquette County is shown, which was made at the request of Hon. Peter White, by Julius Rapes, of Ishpeming. This geological exhibit comprises over 700 specimens, all distinctly labeled and identified, and furnishes a very interesting record of that section.

lite, laumontite, datolite, witherite and calcites of exquisite beauty and fine specimens of iron ores in forms of kidney, grape, pipe and needle ore; as well as several rich specimens of auriferous quartz from Marquette County. One specimen of needle ore is especially deserving of notice. It is about the size and almost the exact shape of the wing of a goose, and of exquisite form. Many of the calcites shown present beautiful combinations of that mineral, with the dendritic forms of copper for which this section is so famous.

In the preparation of the Michigan Mineral Exhibit it was the aim of those having it in charge to render it educational in as complete a sense as possible, as well as attractive. How well they have succeeded in rendering it so is seen from the appreciation of both experts and the general public.

MINING AT THE COLUMBIAN EXPOSITION.

THE ROESSLER & HASSLACHER CHEMICAL COMPANY'S EXHIBIT.

The accompanying engraving shows a general view of the excellent exhibit made by the Roessler & Hasslacher Chemical Company, which was described under this head in the "Journal" of last week. The general form and arrangement of the exhibit in the Mines Building are well shown in the photograph.

ABSTRACTS OF OFFICIAL REPORTS.

NIAGARA MINING AND SMELTING COMPANY, UTAH.

The report of the manager for the year ending September 15th, 1893, shows total receipts of \$98,023, of which \$57,544 were from



THE ROESSLER & HASSLACHER CHEMICAL COMPANY'S EXHIBIT AT CHICAGO.

It is but fitting also to mention the exquisite serpentine and verde antique marble display made by the Deer Lake Company, of Ishpeming, Mich. Though these marbles have not yet been quarried, there appears to be no doubt but that they are to be had in large quantities on the land of this company. Geologically they are of Huronian age, and they occur in all shades, from dark to light apple green, one specimen shown being beautifully marked with strong veins of calcite or dolomite. Other specimens are distinguished by markings of many little veinlets of the same mineral, almost hair-like in size. The marble is capable of receiving a very high finish, and is one of the undeveloped resources of Michigan.

The salt interests, which commercially are of such importance to Michigan, do not seem to have appreciated the value of a proper representation. With the exception of the Diamond Crystal Salt Company, of St. Clair, which presents a small but creditable exhibit of dairy and table salt, this interest is almost wholly unrepresented. When it is considered that the State has produced within the past 10 years about 43% of all the salt of the United States, it is to be regretted that it has not been more largely represented. To Michigan gypsum and calcined plaster made therefrom have been paid the tribute on account of their great purity, of exclusive selection for use in all the statuary upon the Exposition grounds, besides the consumption of an enormous quantity for the manufacture of "staff." In this material Michigan maintains a lead, producing over 40% of the total output of the United States.

Nine cases of choice selections from the cabinets of Lake Superior gentlemen adorned the wall spaces of the exhibit, the list including fine specimens of native copper in every form of its occurrence, native silver, massive and crystallized, analcite, apophyllite, natro-

ore sales, \$4,835 from miscellaneous sources, and \$35,643 received from the secretary. The disbursements are given in the report as follows: Remitted to secretary from ore returns, royalties, etc., \$27,566; paid on ore accounts, \$36,123; mine expenses, \$6,960; mill account, \$4,732; real estate, land and mining claims bought, \$7,714; buildings, \$193; expense account, salaries, etc., \$8,037; miscellaneous expenses, \$1,495; improvement and development work, \$510; total disbursements, \$97,832, leaving a balance of \$191. The manager's report also gives the total tons of ore shipped at 5,728, carrying 1,080 tons of lead, 52,069 oz. silver and 750 oz. gold. The shipments from the various mines of the company were as follows: Utah, 2,661 tons, averaging 29.27% lead, 8.37 oz. silver and 0.076 oz. gold. Spanish, 950 tons lead ore, averaging 19.07% lead, 7.02 oz. silver and 1.42 oz. gold; 1,279 tons iron ore, averaging 5.09 oz. silver and 0.219 oz. gold. Live Pine, 287 tons, averaging 23.92% lead, 41.80 oz. silver and 0.137 oz. gold. Climax, 169 tons, averaging 28.24% lead, 10.02 oz. silver and 0.188 oz. gold. Indiana, 3.22 tons, averaging 10.60% lead, 92.03 oz. silver, and 0.17 oz. gold. Silver Plume, 0.76 ton, averaging 43.30% lead, 96.65 oz. silver, and 0.115 oz. gold. "1889," 378 tons iron ore, averaging 13.22 oz. silver and 0.303 oz. gold per ton.

The statement of work done for the year shows that in the Utah the 100-ft. level has been extended 200 ft. and connected with an incline sunk by the Old Jordan Company, exposing lead ore of average grade and considerable quantity. On the 200-ft. level a cross-cut was extended 240 ft., a drift run on a cross vein 195 ft., and 100 ft. of an upraise, which cut the big vein; but work was stopped owing to an injunction. This level is now under water, the pumps having been taken out to save expense. Several lessees are working and have found a small streak of ore which may lead to a large

deposit. There is a bunch of quartz in sight assaying about \$8 per ton in gold, and a working test of 50 tons is to be made before deciding on treatment. The development work shows more ore in sight than ever before.

On the Spanish mine no development was done on account of the fall in prices of silver and lead. Lessees have been taking out ore from the old workings near the surface. On the Climax group and on the Live Pine work has been done by lessees; on the latter development is now being made and drifts extended into new ground. The other properties, Indiaua, Miller and Silver Plume, have been worked in an irregular way by lessees, but nothing permanent has resulted therefrom. The Indiana and Miller are small, but promising veins, and merit substantial development. The half interest in the "1889" claim is being worked under lease, and is now shipping considerable ore, principally iron and gray copper. Specimen assays of the gray copper yield as high as 200 oz. of silver per ton. This rich ore coming from the deepest workings on the big vein encourages still deeper development. Franklin tunnel has been driven during the year 45 ft., and measures altogether 844 ft. 6 in. It was the intention to keep this work going continually, but the need of ventilation prevented it; 1,000 ft. 9-in. pipe has been sent to the tunnel, and as many of it as needed put in position. A boiler from the old Spanish mill has been made ready to put in position, and everything is ready to continue the work. The Niagara and Palen claims, covering the entrance and line of the tunnel, have been patented, and a half interest in the "1889" claim purchased, which gives the company plenty of ground for buildings, mill sites and dump room, and right of way clear through to the Spanish and Utah mines.

THE WASTE OF HEAT IN SMELTING IRON ORES.*

By Sir Lowthian Bell.

In this paper the author said that, to produce a ton of pig iron in Scotland 50 or 60 years ago, 11¼ tons of coal was consumed. This was reduced to eight tons before 1830, and this again had been brought down to less than two tons in furnaces using the poorer mineral of Cleveland. Experience was the sole guide of the ironmaster of that day, and three tons of coke for each ton of iron was the result of the lessons taught by this adviser. More recently, scientific research made it known that a given amount of heat was capable of raising a certain weight of water 1°, twice the heat 2°, and so on. Under the appellation of heat units or calories, the quantity of heat could now be measured with almost the same exactitude that its intensity was estimated by means of the thermometer and by the pyrometer. To give an idea of the important function played by intercepted heat, it was ascertained at his Clarence works 25 years ago that, of the high temperature in the hearth of an 80-ft. furnace, 70% present at any particular time owed its origin to its absorption by the materials during their immersion in the heated gases. After allowing for the foreign matters in the coke, each unit of the fuel used in the furnace was calculated to yield, when burned with air at 212° F., 2,545 calories; equal, therefore, to 152,700 calories from the 60 cwts. of coke consumed. On the other side of the account they had this heat appropriated to an extent of 84,028 calories, leaving 68,676 calories, considered as having been carried off in the gases. Reckoning 2,545 of these thermal units to represent one unit of coke, they had 33,017 cwts. for actual work, and the remaining 26,893 cwts. expended without any useful results. In 1828 it occurred to Walter B. Neilson, a gas works manager in Glasgow, to suggest heating the air previously to its admission into the blast furnace. In 1862 Messrs. Whitwell built a pair of furnaces 60 ft. in height, and in the same year Messrs. Bolckow and Vaughan constructed one 75 ft. high, with a capacity of 10,500 cub. ft. Mr. Vaughan's object was an increased make; but, in addition to this, a considerable economy of fuel was realized. He (Sir Lowthian) inquired into this, and found that there was a larger amount of carbon oxide and a reduced amount of heat in the escaping gases. This discovery led them to erect a pair of furnaces at the Clarence works 80 ft. in height, with a capacity of 11,500 cub. ft., or close upon double that of the six furnaces already in blast there. Subsequently, others were built with a capacity of 25,500 cub. ft., the height being the same as the first two, 80 ft. The result of his experience was that, of the 84,841 calories expended on the actual furnace work proper, all save 23,000 might be regarded as irrecoverable. The exceptions were those which appeared in the solid products, the pig iron and the slag. Of the heat obtained from the combination of the carbon oxide in the escaping gases there was also a product, the exhaust steam from the engines employed, which, as it reached the atmosphere, carried with it a certain amount of heat, which was now lost. He then inquired how these escaping gases might be made available. The 6,600 calories contained in the pig iron at the moment of its running from the furnace were speedily dissipated, so that none of the heat of fusion could be made use of. The 15,500 calories conveyed from the furnace in the slag were differently circumstanced; there was not only much more initial heat to deal with, but, instead of being spread over a large surface, like the iron, the slag was run into compact masses, which cooled slowly. He had made experiments to ascertain what temperatures could be obtained by passing the exhaust steam over the slag balls; there was no reason to doubt that the steam might be heated considerably above 500° or 600°. From his experience at the Clarence works in the evaporation of brine it occurred to him to utilize the heat daily going to waste at the blast furnace, and so far as the figures at his disposal enabled him to calculate, a furnace producing 500 tons per week might be regarded as probably being able to evaporate a quantity of brine equal to about 150 tons of salt. He hoped to be able shortly to give the exact origin of the heat, which he would put in the Transactions of the Institute.

* Abstract of paper read at the September meeting of the Iron and Steel Institute of Great Britain.

A VISIT TO THE PYRITES MINES OF SPAIN.

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

Amongst the musty Latin documents stored in the British Museum is a brief description of the loss of a vessel while attempting to enter one of the Roman ports during a storm. She came from Southern Spain, and was laden with bars of copper belonging to the Roman Government. But vessel, crew and cargo were all lost, and doubtless the price of armor experienced a decided upward tendency. This copper came from the enormous deposits of pyrites which are found in the southern portion of the Spanish peninsula lying west of Gibraltar and south of Seville. And as important and profitable as they doubtless were to the Roman Emperors 2,000 years ago, they are infinitely more important and profitable to English investors and manufacturers to-day. The ore occurs in immense masses, several thousand feet in length, from 300 to 800 ft. in width, and extending in depth to an unknown distance. It is a massive iron pyrites, not a speck of rock being visible in the ordinary ore, and consists mainly of iron and sulphur in equal proportions. It contains also 2 to 4% of copper, and ½ oz. to the 1 oz. of silver per ton, besides a few grains of gold.

Two companies are working and exporting this ore on a very extensive scale—the Rio Tinto Company, of London, and the Tharsis Company, of Glasgow. Each of these great companies owns extensive tracts of land, known to contain many deposits of the ore already described; and each company is a self-contained community, owning its own railroad to the port of Huelva, its own mines, workshops, villages, schools, churches, hospitals, etc. The managers and chief assistants, as well as the heads of the various departments, are nearly all English or Scotch, but the sub-foremen and workmen are natives of the country, and seem an industrious, contented and prosperous community. The country about the mines is very hilly and broken; owing to the extreme dryness of the climate, the hillsides are practically barren; and in the immediate vicinity of the mines the sulphurous vapors from the treatment of the ore have destroyed every weed and blade of grass, thus allowing the rains to wash away the thin soil, and exposing the naked skeletons of the hills in all their gaunt sterility.

Instead of mining these huge masses of ore by the ordinary subterranean methods, a system of open quarrying from the surface has been adopted, and to keep the sides of the huge excavations from falling in they are sloped down in a succession of steps, the bottom of the cut being the exact width of the ore body, while the sides diverge toward the surface. Some idea of the magnitude of these cuttings may be had from knowing that 2,000 miners could work simultaneously in one of them without being crowded; and half a dozen locomotives may be seen moving at a time within the excavation, taking out the trains of loaded wagons, while the empties usually run back by gravity.

One of the most interesting features of the work in these excavations is to see the blasting. All the morning the miners have been drilling holes in the solid ore, and when the whistle blows for noon they leave the quarry for their midday rest. We spectators are standing on the surface, at the edge of the cut, and looking down into the great hole, some 400 ft. below us. A casual observer would pronounce the mine entirely deserted; but a more careful scrutiny reveals half a dozen minute figures crawling about in the abyss, and performing certain eccentric evolutions with a stick and what look like coils of wire. These men are the men loading the holes, and the coil hung over their arms is the fuse, or safety-match, on which their lives depend. But the last hole is loaded, and a man with a horn, standing beside us at the surface, gives a series of short, startling "toots," to warn every one that the blast is about to take place. Now the men below have lighted their torches, and as they bend over each hole for a moment, we see the flash of the fuse, showing that it has caught fire. The fuses of the holes that are to be first lighted are cut a little longer than the later ones, that all the blasts may explode at about the same moment. But we are beginning to feel a little nervous about the safety of our friends below; for scores of fuses are smoking away, and yet the men move carelessly about, applying their torches to those yet unkindled with aggravating slowness and unconcern. And how are they ever to find time to climb the 400 ft. which separates them from the surface and safety? While speculating on this interesting question, the men suddenly disappear, and we are relieved to hear that they have found a safe refuge in some of the old Roman galleries that honeycomb most of these masses of mineral. In a moment the entire side of a wall of ore flies outward, and a second later the stunning boom of the explosion reaches our ears. The shots come thick and fast, and a heavy cloud of smoke fills the chasm, warning us to retire a little to the rear, as it makes it impossible for us to dodge the occasional stray fragment that whizzes by us. A long blast of the horn indicates that the last shot has gone off, and when the smoke clears away, and we can again see the bottom of the pit, we are surprised to find how little its appearance has been changed by all this blasting, and what a small heap of debris appears to be lying there. And yet we are told that no less than 3,000 tons of ore have been thrown down before our eyes—enough to load 20 trains of wagons.

Anything pertaining to antiquity is interesting to our generation, and few places have so much to offer in this way as these very mines. The country in their vicinity is covered over large areas with Roman slag, most of it over 2,000 years of age, and yet, on fracture, presenting as fresh a surface as though it had been produced last week. Stone foundations of the little blast furnaces used by the ancients are abundant, and the composition of the slag, as well as its remarkable freedom from copper, shows that they were no unskilled metallurgists. They did not remove the ore in bulk, as the present owners are doing, but followed the richer streaks of copper with a pertinacity, and to a depth and extent that are simply

surprising, considering that they had but poor tools, and no powder for blasting. That they were decidedly skillful and ambitious mechanics is shown by the discovery of various machines, the most interesting and largest being a wheel no less than 18 ft. in diameter, used for lifting water from the deeper workings of the mine. It was placed in a chamber hewn out of the solid rock, and rested on two gudgeons or axles of bronze, which are as perfect as the day they were made. Roman graves have been found in great numbers, and many interesting articles taken from them may be seen in the museum of the Tharsis mine. One of the most common and curious articles buried with the dead in those days was the tear-glass, a beautifully-blown little vial, shaped something like a chemist's test-tube, and supposed to be filled with the tears of the deceased person's friends before being placed in the grave. I suppose the sorrow of the deceased's family circle could be exactly gaged by the size of the tear-glass that was filled for him. Many gold rings and coins are found, as well as copper and silver money; also some pottery of rather rude manufacture; numerous copper and earthen lamps; charms worn by the women about the neck; tweezers, scissors, bodkins and scores of such small articles.

The Romans worked these mines solely for copper; but the present generation has produced the skill required to extract and utilize all the constituents of the ore. The pyrites suitable for the manufacture of sulphuric acid is shipped to England in bulk. The sulphur is burnt off in kilns to make acid; and the residues, consisting mainly of iron-oxide, but also containing such copper, gold and silver as was originally in the ore, are calcined with salt, which converts these three valuable metals into such a condition that they can be dissolved out and recovered separately; while the last residue, consisting solely of oxide of iron, is sold as an iron-ore. This series of processes is one of the most beautiful applications of science to practice that can be instanced; and enables a profit to be made from an ore that is so poor in any one metal that it would not pay to touch. But a very large proportion of the ore produced is not suited for the purposes just described, and to extract the copper from this lower-grade ore, it is burnt in great heaps called "teleras," the ore smoldering slowly for several months, its own sulphur furnishing the fuel, and thus being slowly driven off. The roasted ore is then formed into terraces, covering the hillsides and taking possession of every available slope in the vicinity; the ore being thus spread over hundreds of acres of surface, and amounting in the aggregate to several millions of tons. It is here systematically leached with water, intervals of dryness being allowed, to render a fresh batch of its copper soluble in the water. The liquors that flow out from the foot of these terraces, as well as all waters that come from the ore bodies, are heavily charged with copper and are conducted to a long labyrinth of shallow canals, filled with scrap and pig-iron. Now these liquors have, as the chemist puts it, a greater affinity for iron than for copper. Consequently in the presence of iron they let their copper drop, and take up iron instead. Thus the pigs of iron, of which the precipitating canals contain many thousands of tons, are constantly wasting away and disappearing and requiring fresh iron to replace them, while the bright, red, metallic copper is constantly forming in the shape of scales and crusts and powder. This cement-copper is cleaned up every little while, and after being washed and dried, is shipped in bags to England, to be melted into ingots. At Rio Tinto, a considerable amount of this cement-copper is refined and granulated on the spot, and dissolved in sulphuric acid (also made at the mine) to furnish sulphate of copper (blue vitriol), used as a remedy for the dreaded Phylloxera, that pest of the vineyards.

But Rio Tinto also produces a large amount of ore that is so rich in copper as to make it more profitable to treat it at the mine partially, and this, after roasting in heaps, is smelted at the mine into a rich matte, that is shipped to England for refining.

A unique feature at Tharsis is a very large body of a decomposed schist, that is so impregnated with copper and so cheaply mined by the quarrying method already described that it is leached by the company to a fine profit.

The isolation of these mines, and the fact that they own the railroads, which are the only practicable means of reaching them, makes it impossible for any one to visit the mines without express permission from the authorities at home. But, as I can feelingly testify, those few favored persons who receive this permission are treated with a hospitality and cordial friendliness that words are too feeble to express. Both at Rio Tinto and Tharsis, we were the guests of the companies, and everything possible was done that could add to our pleasure or convenience.

At both mines, the feature that will most strike a mining engineer is the enormous extent of the ore-reserves that are opened up for the future, and which gives to these great corporations a stability and certainty that can seldom be attained by mining companies. Another striking point is the extreme cheapness with which immense quantities of ore and rock are handled. And the entire mining profession is indebted to these companies for showing them to what an extent this system of open-cast mining may be developed. Both companies have excellent railroads to Huelva, over which thousands of tons of ore pass daily on their way to the sulphuric acid plants of the world. Each company also owns a fine iron pier at Huelva, arranged so that the ore is shot from the railroad cars direct into the holds of the vessels.

While it is obviously impossible to publish any details of the business that were kindly given us at the mines, I can at least take a few figures from the companies' public annual reports, to show the enormous amounts of ore handled by them, and the magnitude of their operations. The average amount of ore extracted from the Rio Tinto mine for each of the past few years has been 1,400,000 tons, of which over 400,000 tons have been exported for sulphuric acid manufacture. The balance has been treated at the mine. The annual production of copper at the mines has been about 20,000 tons.

Some 5,000 tons of blue vitriol are also manufactured. The dividends for 1891 were £325,000; while a large amount of debentures was also redeemed, and a considerable sum written off for depreciation of property. Elaborate figures are out of place in an article of this kind, but those who are interested in such matters can find full statements of costs and production in the annual reports of the two companies.

TREATING SULPHIDE ORES AT BROKEN HILL, N. S. W.*

By T. J. Greenway.

As the Broken Hill Junction Company had not at command the funds needed to put up a complete concentrating, separating and smelting plant, the author of this paper proposed as an alternative the treatment of the higher grade sulphide ore by the roast reduction process direct on a small scale, with the view of earning the money required for the adoption of the complete scheme. This proposition was adopted, and a small plant, consisting of a crushing plant, two roasting furnaces and a small smelter, was put into operation, with the result that the company is now in a position to go more fully into the matter, a profit of between £3,000 and £4,000 having been obtained in the course of a few months. The roast reduction, as applied to the treatment of sulphide ore containing more or less zinc, will certainly play an important part in the metallurgical treatment of the Broken Hill sulphides in the future.

The ore treated contained 30 to 35% lead, 18 to 25% zinc, 10% iron, 10% gangue, and from 26 oz. to 30 oz. of silver per ton. The ore is first crushed to pass through a sieve with 1-10th meshes, and then roasted in the ordinary long reverberatory roasting furnaces, measuring 35 ft. by 17 ft. 3 in. Each furnace roasts about 10½ tons of ore per 24 hours, consuming about 1¼ tons of coal and reducing the sulphur contents of the ore to 7 or 8%. The cost of the crushing is at the present time 1s. 3d. per ton, and the cost of the roasting 7s. 9d. per ton. The roasting is carried on at a low temperature, no attempt being made to sinter it. It does not lose more than a few per cents in weight, and the volatilization losses of lead and silver are almost inappreciable.

The roasted ore is smelted with about one-fourth its weight of carbonate ore, together with the proper proportion of fluxes and old slag to form a fusible slag and to render the charges permeable by the blast. The carbonate ore is added in order to increase the proportion of slag-forming material as far as practicable without unnecessarily increasing the proportions of the fluxes. Slags of various types were produced, some of which contained as much as 20% of oxide of zinc, and which were quite fusible. Of the various types tried up to the present time that which has given the best results is a basic slag having the following composition: Silica, 24%; oxides of iron and manganese, 36%; zinc oxide, 16%; lime, 16%. This runs well even if the sulphide of zinc should go a small proportion more than is shown above. It is fairly clean so far as its lead and silver contents are concerned, and it separates from zinciferous matter as well as other types of slag. Seeing that the sulphide ore treated contains so little silica it is not an expensive slag to produce. The quantity of coke used is about 15% of the total weight of the ore and fluxes smelted. The cost of smelting is about 32s. 2d. per ton of ore. The total cost of treating the mixture of sulphide ore and carbonate ore dealt with is now as follows: Crushing (0.8 ton), 1s.; roasting (0.8 ton), 6s. 4d.; smelting, 32s. 2d.; total, 39s. 6d. per ton.

During the five months ending August 30th there were treated 814.7 tons of carbonate ore, containing 16,590.9 oz. silver, and 2,296 tons sulphide ore, containing 67,225.8 oz. silver; a total of 3,110.7 tons, containing 83,816.7 oz. silver, or an average of 27 oz. per ton. The bullion produced was 671.6 tons, containing 80,031.6 oz. silver, or 25.7 oz. to the ton of ore.

During the earlier part of the period referred to the smelting was slower than it is now, the proportions of carbonate ore used were higher, and the costs generally were considerably higher than they are at the present time; indeed, during the whole of the time the works have been in operation there has been a steady advance in the direction of greater economy and more effectual treatment. The quantity of matte produced is small, not more than 2% of the weight of the ore treated, and the above figures include the cost of dealing with this and other by-products. Although the operations have been carried on on a very small scale, the profits are estimated at something approaching 20s. per ton, after paying all working expenses, with silver at present price, viz., 2s. 9d. per oz., and lead at £10 per ton.

Pumice Stone in the Canary Islands.—A mine of pumice stone exists on the Teneriffe Peak, of which the working was only started in 1888. The stone is found in that part of the peak called the "Canadas," at about 2,000 ft. above sea level, which has an area of some 6,000 hectares, out of the middle of which rises the highest part of the peak. The Russian Consul at St. Croix bought this property from the Spanish Government in consideration of an annual payment for the pumice stone taken out, and he associated himself with a Belgian. Under the firm style of Aguilar & Valcke, they commenced operations in 1888, but it was only last year that exportation was really started. In view of the requirements of England, France and America, it is believed, it will develop a trade of great importance before many years. So far, the Lipari Islands have practically furnished the world's supply of this product, exporting about 100,000 tons per annum. The Teneriffe stone is recognized as of excellent quality, and its extraction being of more simple matter than in the Lipari Islands, it follows that a lower price can be made.

*Abstract of article in the "Australian Mining Standard."

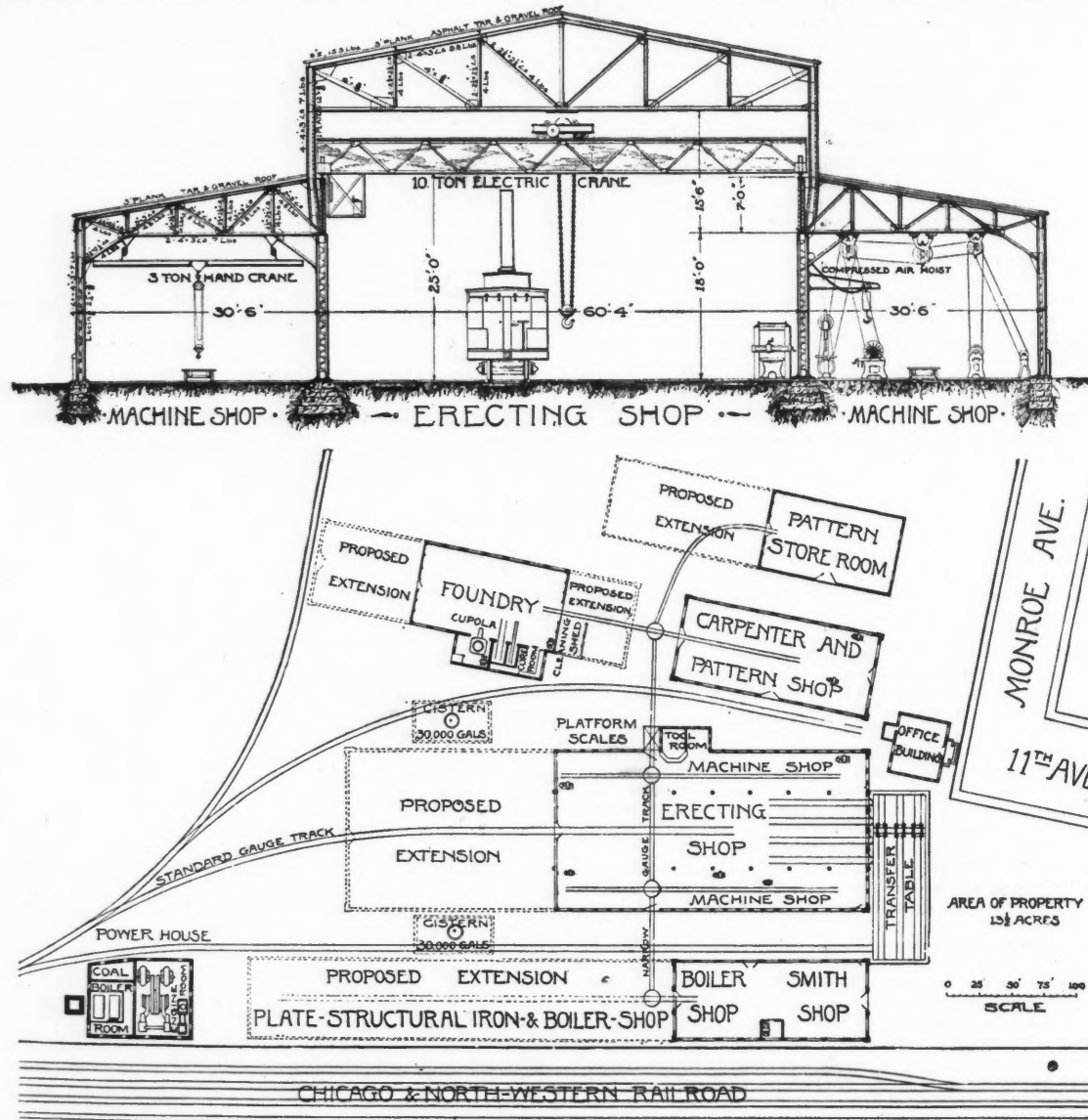
THE NEW SHOPS OF THE BUCYRUS COMPANY.

The Bucyrus Steam Shovel and Dredge Company was established at Bucyrus, O., about 10 years ago, and from small beginnings it grew and increased, until the original works became so crowded that new establishments became necessary for carrying on and developing the business. The work executed by this company includes steam shovels, light dredging machinery, heavy dredging machinery, railroad and locomotive cranes and wrecking cars, placer mining machinery on the Bucyrus amalgamator system. Under these headings are included a great variety of auxiliary appliances and machines connected with similar work, such as centrifugal pumps, ballast unloaders, pile-drivers, etc.

The new plant is located at South Milwaukee, Wis., on the line of the Chicago & Northwestern Railway, 10 miles south of the city of Milwaukee, and it is planned on an extensive scale. The ground occupied comprises 15 acres, divided into the main establishment and the shipyard located on the harbor on the lake shore, three-quarters of a mile distant. The latter has ample dock facilities, and is connected with the main works by a belt line railroad.

offices, are ground floor only, and that electricity furnishes the sole means of distributing power throughout the entire plant. The reasons for adopting electric distribution of power were that it permits a complete isolation of the boiler and power plant from all of the buildings; it gives a ready and convenient distribution of any desired amount of power to any desired place and at any desired speed; it avoids the wear and loss of power on machines that are used occasionally or intermittently; the system lends itself to a variety of subsidiary uses such as electric light, electric welding, electric traveling cranes, electric portable drills, etc. The power is distributed from a central power house to various localities where power is required, 15 motors from 4 to 15 H. P. each, or 166 H. P. total, being placed in the various shops, where needed. Two multipolar generators, each of 150 H. P. (one of which is a reserve), driven by a Corliss engine, are employed. The larger motor and generators are of the slow-speed type, so that connection can be made from the motors direct to the line shafts with one belt.

Referring to the illustration it will be seen that the roof of the main building is 120 ft. span, divided into one central span of 60 ft. and two central spans of 30 ft. each. One of the side spans is used



THE NEW SHOPS OF THE BUCYRUS STEAM SHOVEL AND DREDGE COMPANY.

The general plan of the main buildings and a cross-section of the machine and erecting shops are shown in the accompanying cuts. The buildings are of steel, brick and glass, and comprise the following: Offices, 40x60 ft., three stories; main building, 120x240 ft., with overhead traveling electric crane the entire length; smith shop; plate and structural iron shop; foundry, with overhead traveling electric crane; pattern shop; carpenter and wood shop; pattern store house; general store house, and power house. It will be seen from the plan that the works are arranged with a view to systematic extension, so that the capacity can be more than doubled as future requirements demand, and the works still be a complete and systematic whole. The defects which are so manifest in nearly all great establishments which are the result of growth will thus be obviated.

The buildings are heated by the hot-blast ventilating system. A complete system of standard-gauge tracks connects all the buildings with each other, and there is also a narrow-gauge track for hand trucks as indicated on the plan; a transfer table provides access to the construction tracks in main building. The distinguishing features of the plan are that all the buildings, with the exception of the

as a machine shop for the lightest tools, while the heavy tools are placed out along the edge of the central floor so as to be under the field of the overhead traveling crane. The smaller machine tools in which the work to be lifted is beyond hand-power are served by compressed air hoists suspended from light lib cranes attached to the wall, or to the pillars of the building. Compressed air is used for the foundry hoist to the cupola platform, where an air cylinder having a tubular plunger is sunk in the ground and operates the elevator platform by direct lifting. Compressed air is also used for blowing out cylinder castings and for testing small engines in the erecting shop. The compressed air is furnished by a duplex air pump of the American air-brake type, as used on locomotives. This is placed in the engine-room and a receiver kept charged at all times to the requisite pressure. There is no accumulator, and the apparatus is entirely automatic in its action.

The officers of the company—Wm. Hamilton Harris, president; H. P. Eells, vice-president and treasurer; A. B. Stetson, superintendent; W. B. Crittenden, general manager; A. W. Robinson, chief engineer, and J. M. Millman, secretary—have their quarters in a separate building. On the ground floor are the business offices, with the

general manager, superintendent and secretary. The whole of the second floor is devoted to the drawing office, with the chief engineer's office, which has accommodation for 14 draughtsmen. The high order and a varied description of the work makes necessary a complete system of records. The range of work runs from the lightest sectional steam shovel, capable of being transported on a mule's back, to largest seagoing dredge of 10,000 cu. yds. capacity. The dredges already built alone number over 20 sizes, running up to some of the most powerful in existence.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Supreme Court of Colorado.

Relocation of Mine by Junior Locator.

Section 2324, Revised Statutes U. S., provides that, on failure to perform labor or make improvements on a mining claim to the extent of \$100 per year, the claim shall be open to relocation, provided that the original locators, their heirs or assigns, do not resume work before such relocation. Section 2409, General Statutes, provides that if the locator of a mining claim is desirous of taking in part of an overlapping claim which has been abandoned, he may file an additional certificate. Territory abandoned under the former provision may, under the latter, be taken by the owners of the junior location. An additional location certificate, filed by the locator of a claim for one of the purposes enumerated, need not specify for what purpose it was filed. The burden of proving a forfeiture of a mining claim is upon the person alleging it. Where the owner of a claim relocates it under a different name in order to protect his rights, and to preserve the claim from relocation by others, until he can obtain title by deeds, from the original owners, and work is done to protect the lode under both titles, such work will inure to the benefit of the original claim, as afterward deeded to him.—*Johnson vs. Young*, 34 Pacific Reports, 173.

A New Battle-Ship.—The battle-ship "Oregon" was launched from the yard of the Union Iron Works at San Francisco on Thursday, October 26th, the event being attended by considerable ceremony. The "Oregon" is the first battle-ship built for the Navy on the Pacific coast, and is a sister ship to the "Massachusetts" and "Indiana," built at the Cramp yards in Philadelphia. The ship, of course, has not yet received her armor, and will probably not be complete for two years yet, the contract requiring her delivery in October, 1895.

Steel Coal Barges.—Some time ago W. H. Brown's Sons, of Pittsburgh, built a steel coal barge for the Ohio River trade as an experiment. It is of the regulation size, 135 by 25 ft., and is built of ¼-in. steel plates. It has made four trips from Pittsburgh to Cincinnati, and is regarded as successful. How far the use of steel can be extended in this way remains to be seen. According to the figures of the "American Manufacturer," the ordinary wooden barge costs from \$1,300 to \$1,400, and will last about 10 years; but after each trip it requires calking at a cost of \$20 to \$75. The steel barge costs \$4,000, or about three times as much as the wooden one; but it is claimed that the expense of calking and also that of pumping is saved. It is also claimed that the steel barge will last 30 years, and that for 15 years it will require no serious repairs. This claim, of course, is partly conjectural, but if it should be established by experience, a calculation will show that the steel barge is the cheapest in the long run.

Cost of Power Transmission by Electricity.—At the recent meeting of Section G, British Association, Mr. Gisbert Kapp read a paper entitled "Relative Cost of Conductors with Different Systems of Electrical Power Transmission." The author said that with the alternate current there is no necessity of high insulation of generator or motor, but only of the transformers, which can be easily insulated by the use of oil or other means. The author dealt with five systems of the transmission: 1. Single-phase alternating current transmission by two wires; 2. Double-phase alternating current transmission by four wires; 3. The same by three wires; 4. Three-phase alternating current transmission by three wires; 5. Continuous current with transmission by two wires. Thus if for the transmission of a certain power over a given distance by continuous current, 100 tons of copper were required for the line, then the single-phase alternating and the two-phase four-wire system would require 200 tons. The two-phase three-wire system would require 290 tons, and the three-phase three-wire system only 150 tons; therefore, so far as the line might be concerned, there would be a distinct advantage in the employment of the three-phase system.

An Australian Meteorite.—This meteorite was discovered by a Mr. Langston about 12 months ago, on the top of one of the ridges of the main Moonbi Range, about 18 miles from Moonbi township, on the Northern Railway line. It attracted attention from the fact that all the country around is of granite formation. The meteorite was not imbedded, but was found lying on the surface, and had been probably placed in that position by the blacks of that neighborhood. An average sample of the meteorite in the form of a fine powder, obtained by boring a hole in it, was sent by the Government Geologist (Mr. E. F. Pittman) to the laboratory for analysis, March 24th, 1892. The analysis was made by Mr. John C. H. Mingay, assayer to the department. The total weight of the meteorite was about 29 lbs., the specific gravity of the mass being 7.681; the specific gravity of fragments was found to be slightly higher, viz., 7.833 at 15.5° C. The surface is coated with a black hard skin of magnetic oxide of iron, about the thickness of ordinary writing paper. The composition of this meteorite is somewhat similar to one found at Bingera, New South Wales, but containing less iron and more nickel. It may be described as a metallic meteorite of the class known as siderites.

The analysis showed metallic iron 91.350; metallic nickel, 7.886; metallic cobalt, 0.564; metallic copper, minute trace; metallic tin, 0.003; metallic chromium, trace; carbon (graphite), 0.068; combined carbon, trace; silica, 0.039; phosphorus, 0.217; oxygen, trace. Sulphur was wholly absent. The occluded gases showed 31.42 cc. hydrogen and 23.95 cc. nitrogen.

Production of Manganese in the Caucasus.—The manganese ore industry of Sharopan is the subject of a recent report furnished by Mr. Stevens, British Consul at Batoum. He states that the industry is one of the chief sources of Caucasian wealth, and is of vital importance to the population of the Government of Kutais, and even to Russia itself, which now furnishes 150,000 tons of this ore annually to other European nations for the purpose of making steel. England, Mr. Stevens says, is one of the largest consumers of the mineral, and obtains more than half the quantity she requires from the Caucasus. America has also become a consumer, and it is expected that as railway facilities are developed an augmentation in the demand will take place. The ore fields were visited in 1879 by the representatives of Messrs. Krupp and some other large firms, who obtained plots of land and began to manipulate the ore, but were afterward ousted by the local landed proprietors. The natives work the ore in the most primitive fashion, only that nearest to the outside edge of the mountains having been touched. Notwithstanding this, the production steadily increased from 871 tons in 1879 to 4,081 tons in 1880, 20,370 tons in 1885, and 137,097 tons in 1889. This year, it is stated, the export will probably reach the large total of 322,600 tons. The industry is greatly handicapped by the difficulties of transport in the mountainous region in which the mines are situated, and by the want of skilled labor and modern appliances. The mines are capable of much larger production if these difficulties could be overcome, and the necessary transport provided. The inhabitants of the district have recently petitioned Government to increase the rolling-stock of the railway, which is now able to transport only 64,500 tons of ore per annum, whereas the quantity already exported from the mines greatly exceeds those figures.

PATENTS PUBLISHED IN GREAT BRITAIN.

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

WEEK ENDING OCTOBER 28TH, 1893.

- 18,570 of 1892. Supporting Frames for Use in Shaft Sinking. A. Simon, Gladau, Germany.
- 20,819 of 1892. Coal Mining Machines. W. G. Liversedge, Sheffield.
- 21,994 of 1892. Tanks for Containing Hydrochloric Acid. T. D. Owen, New Brighton.
- 22,157 of 1892. Chemical Apparatus for Treating Solids and Liquids with Gases. J. J. Melville, New York.
- 22,714 of 1892. Manufacture of Boric Acid and Borax. Dr. P. Marquart, Cassel, Germany.
- 2,318 of 1893. Electric Percussive Tool for Rock Boring, etc. G. H. Williams, New York.
- 11,581 of 1893. Separation of Nickel from Copper. W. P. Thompson, Liverpool (C. C. Bartlett, New York).
- 14,341 of 1893. Transport of Coal through Water Mains. W. C. Andrews, New York.
- 15,669 of 1893. Electrolytic Baths. N. Browne, London (A. Vogelsang, Dresden, Germany).
- 15,895 of 1893. Sulphuric Acid Plant. F. B. Hacker and P. S. Gilchrist, Charleston, S. C.
- 16,112 of 1893. Universal Clamps for Rock Drills. John Larmuth and R. B. Howarth, Manchester.
- 16,609 of 1893. A New High Explosive. H. H. Lake, London (W. Adams, Broken Hill, Australia).

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

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

TUESDAY, OCTOBER 31st, 1893.

- 507,537. Pump. William E. Good, Philadelphia, Pa. Assignor to the Southwark Foundry and Machine Company, same place.
- 507,562. Building Stone. Eugene Smith, Chicago, Ill.
- 507,644. Steam Generator and Superheater. John Bonicard, Paris, France.
- 507,663. Manufacture of Inflammable Aeriform Substances for Illuminating or Heating. Frank D. Moses, Chicago, Ill. Assignor to the Universal Gas Construction Company, Minneapolis, Minn.
- 507,692. Furnace for Steam Generators. Charles W. Stockford, Brooklyn, N. Y.
- 507,709. Sheet-Metal Pipe. Charles S. Hamlin, Los Angeles, Assignor of one-half to Arthur C. Horner, University, Cal.
- 507,712. Automatic Elevator. John P. Lybarger, Van Wert, Assignor to John R. Ashton, Lima, O.
- 507,721. Latch for Dumping Car Doors. John M. Phillips, Baldwin, Pa.
- 507,723. Method of Making Mine Pulleys. Charles C. Steck, Hughesville, Pa. Assignor to Charles William Woddrop and Benjamin Harvey Welch, same place.
- 507,741. Process of Making Carbon Dioxide. Edward Luhmann, Andernach, Germany.
- 507,750. Method of and Apparatus for Manufacturing Rectangular-Meshed Wire Netting. Alfred N. Pearson, Auburn, and Robert Penn, South Melbourne, Victoria.
- 507,753. Process of Making Cyanides. David J. Playfair, Glasgow, Scotland.
- 507,780. Rotary Engine, Pump and Blower. Alexander F. G. Brown, Dalry, Scotland.
- 507,800. Apparatus for Forging and Shaping Small Articles of Metal. Joseph J. B. E. Genes, Ivallois-Perret, France.
- 507,801. Artificial Stone. Charles George, Berlin, Germany.
- 507,822. Aluminum Solder and Process of Making Same. Marguerite H. Lancon, Bienna, Switzerland.
- 507,877. Flexible Metallic Tubing. William H. K. Bowley, London, England.
- 507,882. Water Elevator. William H. H. Campbell, Denver, Colo. Assignor of one-half to Irving R. Darrow, same place.
- 507,885. Apparatus for Purifying Asphalt. Augustus S. Cooper, Santa Barbara, Cal.
- 507,886. Electrolytic Apparatus. Thomas Craney, Bay City, Mich.
- 507,891. Apparatus for Boring Mine Galleries, Tunnels, etc. Friedrich Dünschede, Essenberg, Assignor to R. W. Dinnendahl, Steele, Germany.
- 507,901. Valve for Gas or Air Compressors. James E. Geist, Philadelphia, Pa. Assignor to the Pennsylvania Iron Works Company, same place.
- 507,906. Fuel Economizer. Louis J. Hiet, Somerville, Mass.
- 507,917. Pressure Device for Retort Lids. Frederick V. Matton, Camden, N. J. Assignor to the Camden Iron Works, same place.
- 507,938. Steam Boiler Furnace. Henry Sieben, Chicago, Ill.
- 507,943. Grinding and Crushing Mill. Reinhold Steinbach, Magdeburg, Germany. Assignor to the Grusenwerk, same place.
- 507,975. Gas Generator. Jackson de Neal, Toledo, O. Assignor to Albert M. Chapman and Mortimer J. Mann, same place.

PERSONALS.

Mr. A. J. Forbes-Leith, of the Illinois Steel Company, has returned from Europe.

Mr. S. Sith, of New York, has recently been inspecting the Dunn and the Means mines, in North Carolina.

Mr. T. M. Allen, smelter superintendent of the Butte & Boston company, has returned to Butte from the East.

Mr. Frank Klepetko, superintendent of the Boston & Montana smelter, at Great Falls, recently spent a few days in Butte.

Mr. Charles Ziegenfuss, superintendent of the Jaragua (Cuba) Iron Company, has returned to this country, and is now at his home in Bethlehem, Pa.

Mr. J. F. Wannemaker has resigned his position as manager for the Mt. Wilson Gold and Silver Mining Company, on the Silver Pick mine, at Seymour, Colo., and will spend a few months at Montrose, Colo., winding up his business in that State.

Mr. John A. Potter has resigned his position as chief mechanical engineer of the Carnegie Steel Company, at Pittsburg, and has accepted the position of vice-president and superintendent of the Britton Iron and Steel Company, at Cleveland, O.

At Washington, November 6th, Mr. R. E. Preston was sworn in as director of the United States mint. He failed of confirmation by the Senate, but the President has commissioned him as director in the recess, which insures his renomination to the Senate in December. His appointment is an excellent one.

Mr. A. Potter, chief mechanical engineer of the Carnegie Steel Company, has severed his connection with the company to accept the position of general manager of the Britton Iron and Steel Company, at Cleveland, one of the largest industrial concerns in Ohio.

The final examinations of the Royal Polytechnic School, at Charlottenburg, Berlin, took place last month. The severity of the test may be inferred from the circumstance that only about one-half of the number of students examined were permitted to pass. Among these was a single American. Those who had failed were privately notified of the fact, while the successful competitors were invited to meet the Faculty in the large assembly hall of the institution, where they listened to a congratulatory address from the president, who remarked in closing that the honors of the year were equally shared by two students, one a Prussian and the other an American; that these gentlemen had passed the examinations with a rating beyond any previous standard of excellence, and had achieved the highest rank in scholarship ever attained at the school; and that the Faculty would take pleasure in bearing witness to their merit by the bestowal of the utmost honors which it was authorized to confer. Of the Prussian student receiving this extraordinary distinction, we know at present only that his name is Erhardt; but if he lives to fulfill the promise of his beginning, we shall all know more of him in due time. The American is Mr. Lewis C. Bayles, the son of Mr. James C. Bayles, ex-president of the American Institute of Mining Engineers, whose many friends will heartily sympathize with his paternal satisfaction. Mr. Bayles, having finished a double course in mechanical and civil engineering, will remain abroad for another year, for special work in bridge building and general construction.

OBITUARY.

Marcus C. Lanus died at York, Pa., November 6th, aged 54 years. He was for many years the manager of the well known and extensive coal and lumber firm of H. Lanus' Sons.

Eli S. Trego died at Reading, Pa., November 5th, aged 85 years. He was engaged in the iron business at Milton, Pa., until 1873, when he retired. Since that time he has lived in Reading.

John Patton Bard died at Curwensville, Pa., November 4th, very suddenly, of heart disease. He was well known throughout the entire State, having been largely connected with the coal and lumber industries of Clearfield County.

G. G. Symes, who served twice in Congress as Colorado's representative, was found dead in his office, at Denver, Colo., on November 4th. It is believed that he committed suicide by poison. He was in 1872 Associate Supreme Judge of Montana. He went to Denver in 1874. He was largely interested in valuable mining properties.

SOCIETIES AND TECHNICAL SCHOOLS.

Canadian Society of Civil Engineers.—At the ordinary meeting, in Montreal, November 9th, a paper on "A Cubic Yard of Concrete," by H. F. Perley, was read. The discussion on "Domestic Sanitation," by Mr. Macdougall, and on "Port Crescent Breakwater," by Mr. A. S. Going, was continued.

Engineers' Club of St. Louis.—At the regular meeting, November 1st, communications from the

German Engineering Society and Austrian Society of Engineers and Architects thanking the American engineering societies and clubs for courtesies during the Columbian Exposition were read. Professor Johnson described Colonel Flad's new suction dredge boat and presented full detailed blueprints illustrating its construction. Discussion followed by Messrs. Wheeler, Moore, Bounton, Curtis, Hermann.

Boston Society of Civil Engineers.—A regular meeting of the Society was held October 18th. Messrs. J. N. McClintock, of Boston; George L. Mirick, of Everett; Walter H. Norris, of Melrose, and Chester W. Smith, of West Boylston, were elected members. The deaths were announced of Charles W. S. Seymour, of Hingham, Oct. 15th, and Fred. H. Barnes, of Waltham, Oct. 16th. Prof. Robert H. Richards, of the Massachusetts Institute of Technology, read the first paper of the evening, describing the "Prismatic Stadia-Telescope," and giving the results of some work done with it, showing the degree of accuracy attained. The secretary read a paper by Mr. A. Fteley, of New York, on the "Construction of Reservoir Embankments." A paper was also read on the same subject prepared by Mr. Edwin F. Smith, engineer of the canal department of the Philadelphia & Reading Railroad. A communication from Mr. Chas. C. Campbell, of Lawrence, was read giving his experience as to the "Value of Clay as a Preservative for Sheet Piling and Wooden Flumes." Mr. J. Waldo Smith, assistant engineer of the East Jersey Water Company, contributed a paper on the "Compacting of Earth in Dams and Embankments." Mr. Desmond Fitz Gerald closed the discussion of the evening with an account of some of the dams built in India.

INDUSTRIAL NOTES.

Allegheny Furnace, at Iron Gate, Va., went into blast October 28th.

The Columbia Iron Company's rolling mills, at Columbia, Pa., resumed November 6th.

The entire plant of the Galena (Ill.) Smelter Works was burned November 4th. Loss, \$100,000.

The Cambridge Iron and Steel Company, at Cambridge, O., is running three of its four sheet mills.

It is reported that the Illinois Steel Company's rolling mills, at Joliet, Ill., will start up on November 20th.

The Parkesburg Iron Company, Parkesburg, Pa., has, it is stated, given notice of a general reduction of 20% in wages.

The Chambers Glass Company, at Kensington, near Pittsburg, Pa., resumed on the same date with 900 men and boys.

The Thompson Glass Works, at Uniontown, Pa., which has been idle since July, resumed work November 4th, with a full force.

The Erie City Iron Works, Erie, Pa., have increased their force and are now employing 450 men, running eight hours a day.

The Syracuse Steel Wire Company has been incorporated with \$20,000 capital stock, to manufacture steel wire at Syracuse, N. Y.

The Leechburg Foundry and Machine Company, Pittsburg, is running partly full, and has recently made several shipments of machinery.

The Woodward Iron Company, at Woodward, Ala., has put one of its furnaces into blast. The second furnace is being relined and repaired.

The Inland Steel Company is to be organized with \$130,000 capital stock, to take the rolling mill of the Chicago Steel Works, at Chicago Heights.

The Westinghouse Electric and Manufacturing Company has the contract for three dynamos of 5,000 HP. each for the Cataract Construction Company, at Niagara Falls.

The Oil Well Supply Company, Pittsburg, started up its pipe mill November 6th, and is preparing to start other departments of the works which have been idle since August last.

The Buckeye Engine Company, Salem, O., has made a sale of six compound engines with cylinders 13 x 22 1/4 x 18 in. for the electric light plant at Manila, in the Philippine Islands.

The Pittsburg Reduction Company has awarded a contract for the new building, which it proposes erecting at Niagara Falls, to J. Stewart & Co. for the masonry, and Debbie & Stewart for the ironwork.

A Harrisburg, Pa., dispatch says that there was a practical resumption November 6th in all the departments at the Pennsylvania Steel Works, but that it is not known how long this order will stand.

The contract for cast iron pipe for the Detroit Water-Works, which was referred to last week, was awarded to the Lake Shore Foundry Company, of Cleveland, O., which will furnish 3,500 tons of pipe at \$19.45 per ton, delivered in Detroit.

The Phillips Mine Supply Company, Pittsburg, is building a complete plant for the Washington Coal and Coke Company, coal tipples for the Ocean Coal Company, at Irwii, Pa., and for the Brownsdale colliery, and has several orders for machinery for other coal mines.

The extensive rolling mills of the Union Iron and Steel Company, Andrews, Brother & Co., have signed the scale submitted by the National Finishers' Union, which is said to be practically the one agreed upon by the Amalgamated Association, except that no time is set for its expiration.

Rosena Furnace, at New Castle, Pa., has recently been rebuilt and equipped with all modern improvements. It is now 18 x 75 ft., has four 18 x 65-ft. Massicks & Crooke hot-blast stoves, four Hemp-hill engines, and 12 new boilers. The furnace will make Bessemer pig iron exclusively, and will have a capacity of about 7,000 gross tons per month.

The Reading Rolling Mill Company, of Reading, Pa., has notified its employees that in order to keep the plant running it would be necessary to make a 10% reduction in wages, and reduce the puddlers to \$3 per ton. The employees are inclined to accept the reduction. The plant employs over 300 hands. Every department is in operation.

The Ropeways Syndicate, Limited, of London, England, have issued an illustrated pamphlet describing the Roe & Bedlington system of rope tramways, which the company has supplied to a number of mines, quarries and other establishments in England and on the continent of Europe. This tramway is of the class employing an endless cable. The special features consisting in the clips and sheaves employed, which are fully described in this pamphlet.

The annual meeting of the Reading Rolling Mill Company and of Cofrode & Saylor, incorporated, was held in Philadelphia, Pa., November 6th. The stockholders of the latter concern re-elected Joseph H. Cofrode, Francis H. Saylor and Henry R. Leonard. The rolling mill company elected seven directors, of whom two, Ellis Amos Ballard and Edward J. Kelly, are new. The other re-elected directors are Joseph H. Cofrode, Francis H. Saylor, Josiah F. Bailey, Charles A. Sterling and George W. Bush. A committee consisting of A. M. Dehaven and Siddons Harver was appointed to prepare certificates of the status of the business of the rolling mill company.

The Mahoning Valley has been chosen as the battlefield for the contest for supremacy between the Amalgamated Association and the Finishers' Union. A largely attended mass meeting of the Amalgamated men was held in Youngstown, O., November 6th. Assurances were received from the roughers that they will not return to work until the Amalgamated wage scale has been recognized. A resolution refusing to accept any terms from the manufacturers, other than the signing of the Amalgamated scale, was unanimously adopted November 8th; all the roughers belonging to the Finishers' Union decided to desert the Union and stand by the Amalgamated Association.

The Turner & Seymour Manufacturing Company, at Torrington, Conn., has decided to build a new foundry of iron, and has placed the contract with the Berlin Iron Bridge Company, of East Berlin, Conn. The old foundry burned a short time ago and the company will build the new foundry with side walls of brick and the roof of iron. The roof will be furnished by the Berlin Iron Bridge Company, and will consist of iron trusses and iron purlins, covered with the company's patent anti-condensation corrugated iron. When completed, the building will contain no woodwork whatever, except the window frames and casings, so that it will be absolutely fireproof, and it is the intention of the Turner & Seymour company to carry no insurance on the building, as the Berlin company guarantees that if all the wooden flasks used at any one time were piled in one place in the building and fired, the roof would suffer no damage.

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.

The bill which passed the House of Representatives, providing that Section 2324 of the Revised Statutes, requiring \$100 worth of work to be performed on each mining claim located on the public lands yearly, should be suspended for the present year, with the condition that claimants must

record in the proper land office a notice that they intend to hold and work the claims in good faith, was passed by the Senate also with an amendment providing that claimants must be residents of the States or Territories in which the claims are located. The House accepted this amendment.

Oil.

The monthly report of the "Derrick" for October shows that during the month 139 new wells were completed in the New York and Pennsylvania oil districts, the total daily production of these wells being 4,276 barrels. This is a decrease of 19 wells and 2,124 barrels production from the September report. There were 31 dry holes reported for the month and 312 new wells in progress November 1st.

In the Buckeye district, in Ohio, 120 new wells were completed in October, their total daily production being 4,223 barrels. This district also shows a reduction from September. At the close of the month there were 178 new wells under the drill.

The Southeastern Ohio district shows for October 15th new wells with an average production of 234 barrels daily, and 17 new wells in progress at the end of the month.

In the Indiana field 72 new wells with a total production of 3,442 barrels daily are reported for October, a large increase over the September report. The average production of the new wells completed in October, however, was only 59 barrels, against an average of 93 barrels for those completed in September. There were 75 wells under the drill November 1st.

ALABAMA.

Cleburne County.

(From our Special Correspondent.)

Eckles Mine.—The owners, Eckles & Veize, have commenced work with a plant for washing the placer material. The dirt is first shoveled into a slime box 16 in. wide and about 13 ft. long, with riffles formed by boring holes into a false bottom of the box. After being washed in this box the water and tailings are discharged into a revolving screen of sheet iron, perforated with small holes about 1/8 in. in diameter, from which the coarse particles of quartz and gravel are dumped ready for treatment in a Spanish arrastra, in course of construction, while the finer particles pass through the screen into another set of slime boxes 3 ft. wide, 27 ft. in length. The bottom of these boxes is lined with galvanized iron, covered with a false wooden bottom, perforated with 1/2-in. holes for riffles. About 5 tons of material will be treated every 12 hours. The quantity of water required is less than is usually used in sluicing. Mr. Eckles has used the same description of plant at other diggings with, he claims, very satisfactory results. The surface dirt, as well as the harder vein matter, which is decomposed quartz, which carries the gold in this mine, prospects well in places. A surface crosscut prospects for 40 ft., 60 ft. below the surface where the placer material has changed to harder vein matter, a crosscut shows the ore body to be only 18 ft. thick, but still going down at an angle of about 30°, dipping toward the southeast. No drifting has been done at depth, but the surface has been prospected diagonally across two 40-acre tracts in a direction slightly south of west, and shows continuity for that distance at least. No crosscuts have been made or outcrops exposed, except at the one point already described.

Terrapin Mountain.—This is the local name for the extension of the Appalachian chain after it crosses the State line dividing Georgia and Alabama in the extreme north of Cleburne County. These mountains are the highest, except, perhaps, the Turkey Heaven in the county. At the northern base, along which run the waters of the Little Terrapin Creek, the Talladega slate formation first occurs in Alabama. Near the State line this extends southward to the Big Tallapoosa River, a distance of some 15 miles, and in a southwesterly direction across Cleburne County, being a continuation of the formation of a large portion of the gold belt of North Georgia. The only mineral found up to the present time in paying quantities in the Terrapin Mountains is a deposit of graphite, which occurs about five miles from the State line. Samples from this have been pronounced by experts as being of good quality for lubricating purposes and the manufacture of crucibles. This occurs in a seam of undetermined thickness, outcropping near the base of a high ridge which forms the southern bank of Little Terrapin Creek, and can be traced by its outcrop a distance of some 1,200 ft. in a northwesterly direction. A short tunnel run into the hill shows the body of graphite to dip at an angle of about 8° towards the south and to improve in quality, but no extensive work, with a view to develop its extent, has been done. The same mineral occurs at other locations in the vicinity to the southeast of the deposit mentioned and across the ridge, but no work to ascertain whether in paying quantity or quality has been performed. Gold ore of a refractory nature, highly sulphuretted, has been discovered in many locations in these mountains, but the rebellious character discouraged the prospectors. Iron pyrites, carrying a high percentage of sulphur, also occur, but the large percentage of silica and apparently small extent of the ore bodies, although but very little work was done to determine this, and that too by the inexperienced miners, have been the

causes for this section of Cleburne County not receiving much attention from prospectors. Should development determine that the pyrites were in paying quality and carried a sufficiently high grade of sulphur to make the ore merchantable, the Atlanta market is within 100 miles of the mines and could be easily supplied.

Jefferson County.

The Birmingham "Independent" of recent date says that the miners at Blocton stopped work October 31st, on account of the arrears of pay not being settled according to promise, but those at Blue Creek continue at work up to hour of going to press. The miners of Pratt mines were paid for August on Monday, but the other workers were not paid. Gurney and Oneida also quit work, not yet having received their pay for August.

Walker County.

Virginia & Alabama Coal Company.—This company paid off in cash last week at its mine for the first time for several weeks, and a general resumption of cash payments has been reported recently.

CALIFORNIA.

Amador County.

Gover.—The underground force at this property was put to work at the 800 level last week during the time the shaft below was being repaired, says the Jackson "Amador Ledger." A small seam of rock which showed a trace of gold was followed up with good results. The seam has widened out to 4 ft. and is said to be full of mineral. The mill is shut down at present on account of repairs making in the shaft and the tramway running from the mine to the mill. The owners are also repairing the machinery in the mill.

Lake County.

(From our Special Correspondent.)

Calistoga Copper Mining Company.—Two tunnels have been run in the mine, one about 178 ft., and the other about 160 ft. The several veins range from 1 to 15 ft. in thickness, the assays showing from 35 to 74% of copper, and silver running nearly \$300 per ton. So soon as the company has opened out on a sufficiency of ore smelting, machinery will be put in.

Mono County.

Bodie Consolidated Mining Company.—The latest weekly letter reports bullion on hand valued at \$1,715. A small amount of ore was recently crushed at the mill, the battery samples of which averaged \$33.35 per ton, and the tailings \$8.71.

(From our Special Correspondent.)

Summit Mining Company.—During the late run on ore from this mine 117 tons of ore were crushed, and bullion valued at \$1,243 has been shipped to San Francisco on account.

Nevada County.

Champion Mining Company.—At the Champion mine the large new hoisting machinery has started up and is working smoothly.

Home.—The new hoisting works at this mine, on Deer Creek, have started up.

Mt. Charles Mining Company.—According to the Nevada City "Transcript," good gravel has been struck in the Mt. Charles mine, on Cement Hill, about two miles and a half from Nevada City. The company ran a tunnel several hundred feet and found good gravel in sufficient quantities to justify the erection of a five-stamp mill, which is now completed and in operation. Some time ago, while running the tunnel, a quartz ledge was struck. The character of the rock is similar to that of the Spanish, both in color and richness, and is thought to be an extension of the Spanish.

Placer County.

(From our Special Correspondent.)

Mayflower Gravel Mining Company, Forest Hill.—A shipment of bullion valued at \$4,300 has been received from the mine.

San Diego County.

(From our Special Correspondent.)

Perris District.—The group of eight mines owned by F. Acker, have been bonded by San Francisco parties for 60 days, at \$32,000 and a two-thirds interest.

COLORADO.

Phonolite Glass Company.—This company has been incorporated in Colorado Springs by the capitalists who, it is said, are about to erect a large plant for the manufacture of glass by the Otto Jensen process. It is capitalized at \$500,000, in shares of \$100 each. The company is to operate in Arapahoe, El Paso and Pueblo counties, the principal office being at Denver. The Phonolite mines, near Divide, are to be started up at once.

State Ore Sampling Company.—This company has been organized by Messrs. Bailey & Moennig, who have been for a long time well known in the Colorado ore market. Their offices have been established at Denver, and the company will sell ore on the public market or at private sale.

Clear Creek County.

The following items of Silver Plume mining news are taken from our exchanges: Recent developments on several prospects on McClellan Mountain show that a strong gold belt runs through that part of the county almost due east and west, and the

returns from mill runs on the ore from the belt are very encouraging. Among those now opened up are the Winnebago, Double-Header and a couple of adjoining claims.

Pay Rock.—The 300-ft. raise from the Ashby tunnel to the shaft and upper workings of this mine has just been finished. The Ashby tunnel was run 2,500 ft. to intersect the Pay Rock lode, and from this tunnel level they can now ascend 1,215 ft. to the surface. Some good bodies of ore were encountered in the raise from the Ashby tunnel, and there are now 13 levels on the property, running both east and west, nearly all of them working, and large bodies of ore in sight.

Stevens.—H. M. Griffin, manager of this mine, is preparing to put in a hoisting and pumping plant to facilitate development work below the tunnel level and control the water which was recently encountered there in such quantities as to force the men out and cover up one of the finest bodies of ore ever opened in the mine.

Two Sisters Mining Company.—The compressed air and power plant of the Bertha Silver Mining Company, an English syndicate, which spent nearly \$100,000 in development work on Irwin's Peak without striking anything in the way of pay ore, and then suspended about three years ago, has been purchased by the Two Sisters Mining Company, and is now being moved down to the Two Sisters mine at Silver Creek.

Winnebago.—This lode is being developed and considerable ore has been taken out, running 7 ozs. in gold and 180 ozs. silver per ton.

El Paso County.

Nugget Mining and Milling Company.—An important strike is reported in the Catherine, a claim belonging to this company, and situated on the south side of Raven Hill, adjoining the Elkton on the northwest. The vein was uncovered at a depth of 12 ft., and is fully 2 ft. wide. The claim is under lease to Kingsbury brothers, who have done over 250 ft. of prospecting work searching for this vein, and have but three and one-half months more of the life of the lease. This find, together with discoveries made in the Elkton workings, is said to show that the Raven vein either divides at or near the Elkton shaft, or this is a new vein which crosses the Raven at an acute angle. This and the Elkton discovery have intensified the legal fights that are being made for almost all the territory in the south and west sides of the hill.

Rosetta.—This Cripple Creek mine, which was recently purchased by Griffith and Flynn, of Leadville, for \$25,000, has been bonded to J. J. Mallin by the owners, at a higher figure. A 10-in. vein of smelting ore has been operated upon the property.

The following items of Cripple Creek mining news are taken from our exchanges:

Los Angeles.—Gus Hull has taken a bond on this mine, situated near Hull's Camp. Recent developments show a big vein of milling ore, with small streaks of high grade. Consideration, \$10,000.

New Boston.—This mine, situated on the west side of Tenderfoot Hill, has just exposed 8 ft. of ore that pans remarkably well. Forty thousand dollars cash was offered for the claim on Friday last and refused.

O. K.—An important strike has been made in this property, situated on top of Bull Hill. The Logan vein has been traced into O. K. ground and opened in several places. Some of the croppings are rich.

Lake County.

(From our Special Correspondent.)

The average daily output of the mines for October was a little over 900 tons, about two-thirds of this being argentiferous iron, the remainder being sulphide, carbonate and a little silicious ore. This month this tonnage will not be as large as, since the further depression and drop of silver to 68 cents, many of the producers have curtailed their forces and in some instances have closed down entirely. The daily output for October was as follows: Roek Hill, 30 tons; Champion properties, 250 tons; Smith-Moffat group, 250 tons; Mahala, 50 tons; Boreel Mining Company, 60 tons; Leadville Consolidated, 10 tons; Union Leasing and Mining Company, 40 tons; Wolcott, 60 tons; Morning and Evening Stars, 75 tons; Catalpa, 40 tons; Dunkin, 10 tons; Mike & Starr, 30 tons; Louisville, 30 tons; leases, 39 tons; total, 960 tons daily.

Bison.—The new shaft is going down rapidly, and a depth of 120 ft. has been reached.

Emmet Mining Company.—This company is working 20 men, and some good manganese iron running well in silver is being taken out.

Penrose.—At this property the management still have their hands full handling the water. The flow is 1,600 gallons per minute.

William Wallace.—This property is being worked by lessees, who are now following a good looking streak of lead in the large iron body already opened up.

Pitkin County.

At Aspen the mineowners and miners finally effected a settlement of their difficulties last Friday. The men are to receive \$2.25 for eight hours' work, with silver at 70 to 75 cents; 75 to 80 cents,

\$2.50; 80 to 85 cents, \$2.75; 85 to 90 cents, \$3. Large forces of men have resumed work.

San Miguel County.

Nellie.—A contract has been let for 500 ft. of tunnel on the Nellie vein, on level No. 1. This level is now in 700 ft., and with the completion of the contract will be advanced to 1,200, with 1,000 ft. of stoping ground above it. No. 2 level is now in 500 ft.

Smuggler-Union Mining Company.—The Bullion tunnel on this property has been advanced to within 120 ft. of the Union shaft. The connection will be made by January 1st, and will open up a body of ore on the Union, 600 ft. deep and several hundred feet long. Work on the tunnel, says the *Telluride "Journal,"* will be continued until the Sheridan cross-cut is reached—a distance of nearly 2,000 ft.

FLORIDA.

Hillsboro County.

Alafia River Mineral Land Company.—This company has purchased washing and other machinery and is making arrangements to put up an extensive plant for mining and preparing phosphate on its property at Lighthall.

Marion County.

Compagnie des Phosphates de France.—This company, generally known in Florida as the French company, is building a railroad line eight miles long from its works, at Anthony, to the Oklawaha River, by which shipments of phosphate will be made.

International Phosphate Company.—The reorganization of this company has been completed, and active work is going on at the mines near Dunnellon.

Pebble Phosphate Company.—This company is reported in financial trouble. The phosphate from its mines is said to have had too large a mixture of shells to be profitably worked.

Polk County.

Clear Spring Phosphate Company.—This company, whose property is near Bartow, has been reorganized with a capital stock of \$150,000, which is principally held in Pittsburg, Pa., where the general offices are located. The officers are: J. E. Umbstaetter, president; James B. Oliver, vice-president; Carl Ansler, secretary. The company has applied for a special charter giving it authority to build a railroad from its works to a connection with any other railroad line in the country.

Pharr Phosphate Company.—This company, at Bartow, says the *"Manufacturers' Record,"* has completely renovated its plant and thrown out all the old machinery purchased about a year ago from the original owners, and starts out on the new season with facilities of the latest and best patterns. The plant has an easy capacity of 100 tons per day. It is probable that Walton, Whann & Co., of Wilmington, Del., whose members own and control the Pharr company, will take the entire output of the mine.

Suwannee County.

Ocala & Blue River Phosphate Company.—This company, at Luraville, has placed an order with McLanahan & Stone, of Hollidaysburg, Pa., for three of their patent steel double log washers and three double-shell screens and conveyors.

GEORGIA.

Lumpkin County.

Chestatee Company.—This company has nearly completed its ditch and other works, and will soon be ready to commence hydraulic operations.

Lockhart.—For the month of October the yield of this mine was 475 dwts. of gold.

IDAHO.

Ada County.

The Helena "Independent" describes a new placer-working plant which has been employed for some time on the Idaho bank of Snake River, above Payette. It is a stern-wheel boat 65 ft. long and 22 ft. beam, with a 35 H. P. engine. The boat has been so arranged that the power can be applied to a steam dredge, which scoops up gravel from the bottom of the river by buckets attached to an endless chain. The gravel is delivered into a hopper, from which it passes into a rocker, provided with amalgamating plates. The tailings are carried off in sluice boxes by a stream of water supplied by a pump, which is also run by the engine. It is claimed that the gravel is thoroughly worked and that little or no gold escapes in the tailings. The boat can handle 100 tons of gravel a day with only three men besides the engineer. It has been nearly all this season employed in working a bar on the river, which covers an area of 10 to 15 acres, and the gravel is handled to a depth of about 18 in. with results, which Mr. Thornton Williams, the owner of the boat, says are satisfactory. When this bar is completed the machinery can be used to carry the boat to another point.

Idaho County.

Great Eastern.—This claim and the adjoining Buckeye claim have been purchased by Frank Mahon for a company which will build a mill and will work the claims. The Great Eastern has had considerable development work done on it, says the Grangeville "Free Press," the ledge having been opened in two places by cross-cut tunnel, from

which some good ore was taken. Near the claim there is a good water power and mill site to which ores of the mine can be taken by gravity. The Buckeye has been opened by a 30-ft. shaft which exposes a vein a free milling gold ore.

Rescue Mine.—This mine, near Warren, has been sold by E. Brooks to Mr. E. B. True, for \$5,000. The mine was developed some years ago to a depth of 300 ft., says the Grangeville "Free Press," and good ore was found at that time, but it has been abandoned for some years and the shaft is now full of water. Mr. True has ordered pumps and other machinery, and proposes to go to work actively at the mine.

Owyhee County.

Black Jack Mine.—In this mine, on Florida Mountains, according to the Boise "Statesman," a force of 60 men has been kept steadily at work. The ore carries a fair percentage of gold, which has made it profitable even with the low price of silver. A contract has been let to run a tunnel commencing at the mill and tapping the lowest working of the mine at a distance of about 1,500 ft. When this tunnel is completed it will be the main working tunnel of the mine, through which it will be drained and the ore carried to the mill.

Dernier Resort.—This mine, owned by R. G. Sothen, is reported as improving in appearance. The owner has spent considerable money running a prospecting tunnel, but has succeeded in taking out enough to pay expenses. The ledge is improving as development advances.

Enterprise.—This property is to be developed. The ledge, as at present open, is 2 ft. in width, and carries considerable gold.

Other properties on War Eagle Mountain, on which development work is in progress, are the San Juan, the South Illinois Central, the Mountain Chief, the Cumberland, the Idlewild, the War Eagle, the Horny Hill and the Empire. On all of these, so far as opened, the ore carries considerable gold besides the silver.

Shoshone County.

Granite.—This mine, on Nine-Mile Gulch, has 50 men on its payroll, two shifts being employed in the mine and one at the mill, under the management of Mr. John Porteus. The concentrates from the mill are shipped to the Kansas City smelter.

INDIANA.

Parke County.

About 400 miners at Rosedale stopped work November 6th, because the screens at two of the mines were lowered or "flattened" so that the coal would screen finer. This, the men claim, is contrary to an agreement made last May.

MARYLAND.

Allegheny County.

American Coal Company.—The Ohio Drill Company recently completed a diamond drill boring for this company at Lonaconing, which extended to a depth of 860 ft. Another boring is being put down on the company's property at Barton.

MICHIGAN.

Copper.

Atlantic Mining Company.—The production of this mine for October was 217½ tons of copper, an increase of 17½ tons over October, 1892.

Calumet & Hecla Mining Company.—On November 1st the vertical shaft had reached a depth of 3,166 ft., leaving about 134 ft. more to be sunk to reach the supposed location of the conglomerate. Local papers state that miners in the No. 3 shaft of the Tamarack company can hear distinctly the blast in the Calumet & Hecla shaft.

Quincy Mining Company.—The output of copper for October was 750 tons, an increase of 50 tons over the corresponding month last year.

Wolverine Mining Company.—The copper production of this company for the month of October was 76¼ tons.

Iron—Gogebic Range.

Norrie Iron Company.—This mine will shortly resume work with a force of about 400 men. The expectation is that at least this number will be kept at work through the winter.

Iron—Marquette Range.

Lake Angeline Mining Company.—The East End mine of this company is to be actively worked. Since the closing down of the old mine many men have been transferred to the new workings. The electric hauling plant recently completed is working very satisfactorily. The trolley system is used and the line is about 1,100 ft. long. There are two motors in use, each handling 20 two-ton cars when required.

MINNESOTA.

Duluth.

(From our Special Correspondent.)

Iron ore shipments from the Vermilion Range last week were 20,191 tons, and from the Mesaba 57,511 tons, including 5,158 tons shipped over Two Harbors' docks by the Franklin mine. Total shipments from the Vermilion for the season are 782,349, and from the Mesaba 477,600 tons. The Vermilion will send out only about 15 cargoes, and will close the shipping season November 15th. The Mesaba is likely to get up to a total of 560,000 tons before it quits.

Iron—Mesaba Range.

(From our Special Correspondent.)

Franklin.—This mine, which shut down last week, starts up in a few days, and will stockpile 100,000 tons before spring. Stockpile grounds are now being graded at No. 2 shaft. Two new 200-H. P. Corliss engines are to go in at the engine-house, near No. 2, and two 3-compartment shafts will be worked, giving a daily capacity of 8,000 tons. The mine is down 190 ft.; 110 ft. of the distance in a high grade Bessemer ore.

Iron King.—A drill is down in ore 238 ft., and is through the deposit. This is the first drill hole put to the bottom of the deposit at any of the larger Mesaba mines, though several will be put down this winter.

Mahoning Valley Ore Company.—This company, which has options on some 28,000 acres of land belonging to Michigan lumbermen, has made Bessemer finds in 57-21.

Oliver.—This mine is doing the most systematic steam shovel work on the range in good ore.

Swedish-American.—The story of a sale of this mine is untrue. Negotiations are under way to this end, however.

Iron—Vermilion Range.

(From our Special Correspondent.)

Chandler.—This mine is also to resume as fast as deemed advisable and will employ a large force all winter.

Minnesota Iron Company.—Resumption of work at this Minnesota mine begins the coming week, and will continue until a large share of the old force is employed. After the water is pumped out, which will take some weeks in some of the shafts, underground work will go steadily forward all winter, but at a reduced scale of wages, in some departments amounting to 35%. The mine stock piles are bare of Bessemer ore.

MISSOURI.

Jasper County.

Quicke Mining and Smelting Company.—This company has been organized to carry on mining and smelting operations in this county. The general office will be in St. Louis.

(From our Special Correspondent.)

Alba Mining District.—This district, which is located about 14 miles north and east of Joplin, is the only place in this entire lead and zinc mining district where the ore deposits have been opened up on the north side of Spring River. The deposits of ore were first discovered about 15 years ago by heavy croppings of silicate of zinc and dry bone on the surface, but little mining had been done except by small operators who stripped the ground for silicate and sunk some pits and opened up a fine grade of blende, but owing to lack of capital the miners could not put in machinery to handle the ore and pump the water. About one year ago the Alba Mining Company was organized in Boston, Mass., and at once commenced operations on an extensive scale by the erection of an ore dressing and concentrating plant with a capacity of about 150 tons of ore per day. A large pumping plant and steam hoisters were also put in and the ore deposits opened by putting down an incline expensive operation, and the plan was abandoned and stripping the ground. This proved to be an and the mines are now operated by the usual plan of vertical shafts and drifting on the ore bodies. At a depth of 150 ft. the miners are working on good faces of ore. The concentrating mill, when first completed, was not properly adjusted for this ore, and it has been almost entirely remodeled, some of the jigs torn out and new ones put in. It is now running smoothly. The owners of the property, Mr. George Dennison, president, Mr. Geo. A. Kettell and Mr. Geo. O. Currier, Jr., have just visited the mine, which is now in charge of Charles Palmer, Ph. D., as manager, and Mr. Vernon, as superintendent.

Joplin, Nov. 6.

We are pleased to be able to report that there was a general stiffening in the zinc ore market throughout the entire district. Good clean zinc ore was in good demand at Cartersville during the week at \$18 per ton, while the top price at Joplin up to Saturday morning was \$17; then \$18 was offered for the ore on the Rex Mining Company's land. The lead market was still unsettled and prices fluctuated from \$16.50 to \$17 per thousand. Following are the sales from the different camps: Joplin mines, 1,455,020 lbs. zinc ore and 291,610 lead, value \$17,608; Zincite mines, 45,050 lbs. zinc ore and 4,450 lead, value \$460; Oronogo mines, 47,870 lbs. zinc ore and 94,080 lead, value \$1,800; Alba mines, 42,000 lbs. of zinc ore, value \$38; Granby mines, 199,000 lbs. zinc ore and 37,000 lead, value \$2,238; no report of sales of ore from Webb City or Cartersville; Galena (Kan.) mines, 1,080,000 lbs. zinc ore and 200,000 lead, value \$11,200; district's total value, \$33,691; Aurora (Lawrence County) mines, 672,120 lbs. zinc ore and 201,050 lead, value \$7,182; lead and zinc belt's total value, \$40,873.

American Spelter Company.—This plant, at Galena, Kan., caught fire Saturday morning, and was damaged to the extent of \$25,000. The fire is said to have originated in the generating-room where the coal gas, which is the fuel used to heat the retorts, is generated. A wooden framework,

inclosed the generator and in the absence of the workman the woodwork caught fire and the flames rapidly spread to the furnace-room, roasting kiln, engine-room and pottery. This plant had been built and then remodeled; then a siege of litigations and then into the hands of Mr. E. W. Humphrey as receiver, and had but recently been put in running order, and we were in hopes that it would prove a success. This loss was followed on Saturday evening by the burning up of the large concentrating plant of the South Joplin Mining Company, located in Joplin. The plant was built three years ago at a cost of \$6,000, and has been running steady; the origin of the fire is a mystery.

Macon County.

The coal miners' strike in this county has been declared off, the men accepting the propositions of the companies.

MONTANA.

Lewis & Clarke County.

Drum Lummon Mining Company.—This company is working its mine at Marysville steadily, says the "Daily Inter-Mountain," and is doing reasonably well. The ore worked now is principally gold ore.

Silver Bow County.

Boston & Montana Mining Company.—At the annual meeting in Butte, October 25th, the old board of trustees was re-elected as follows: A. S. Bigelow, president; A. W. Spencer, Franklin Fairbanks, Charles Van Brunt, Leonard Lewiston, H. Wallerstein and Thomas Couch.

Butte & Boston Mining Company.—The production for October was 2,340,000 lbs. of refined copper, and \$5,690 oz. of silver—a slight increase in copper, but a reduction in silver from September. The company expects to commence using its Bessemerizing process for matte at Great Falls during the present month.

Jay Hawk & Lone Pine Mining Company.—This company's new mill was started up November 1st with some ceremony, a number of invited guests being present. The new plant had cost about \$80,000, and is expected to give very good results.

Penobscot Mine.—Mr. J. H. Longmaid is now working this mine with a small force, and is making a satisfactory profit. The mine is reported as showing springers of rich gold ore in places from the 300-ft. level up.

Rock Breaker.—Some time ago operations were suspended on this mine with the shaft at a depth of 150 ft. It is stated now that funds have been secured and the lessees will resume work, extending the shaft to a depth of 200 ft. and then cross-cutting to the vein.

(From our Special Correspondent.)

Butte.—Cold weather has now forced most of the placer workers to give up; this simply adds to the number of men looking for work.

The clergymen of Butte, of all churches, have sent a letter to all the employers in the city requesting that work be curtailed as far as possible on Sunday, or at least that men wishing to lay off on that day may do so without fear of dismissal. This latter privilege has already been allowed by some, but is seldom taken advantage of by the men.

Anaconda Mining Company.—The forces in all the mines continue small, and the shipments do not average 75 carloads per day.

Lexington Mining Company.—Thirty stamps are now dropping in the mill on ore from the various tributaries in the company's properties.

NEVADA.

Elko County.

Bruneau Gold Fields. The Winnemucca "Silver State" publishes the following: The Bruneau River, lying partly in the northern part of Elko County and distant from the town of Elko from 80 to 90 miles, contains good gold placers. These discoveries have been made in the last few weeks. In the latter part of July, J. A. McBride, of Elko, and Captain Penrod, of Island Mountain, made several excavations in the bottom lands with encouraging results, although on account of water they could not reach bedrock. McBride sent out a party to prospect at another point on the river some distance below where the other parties had located, which resulted in finding coarse wash gold in paying quantities in the gravel from near the surface to bedrock. The bed of the river is from 1,000 to 2,000 ft. below the summit of the mountains on either side. Power desirable for hydraulic mining can be had from the waters of the river. Denver capitalists have lately purchased several thousand acres of placer ground on this side of the summit and are preparing to engage in extensive mining. Their ground extends from near the summit down some 10 miles toward Elko. Parties are mining in several gulches beyond the summit, which run into the Bruneau. Although placer mining to the south and near the Bruneau has been carried on for the last 15 years or more in a belt 50 or 60 miles wide, there is no evidence that any prospecting has been done on the river prior to the late discoveries.

Storey County—Comstock Lode.

Savage Mining Company.—The latest official weekly letter says: On the 1,100-ft. level we are extracting the usual quantity of fair-grade ore from the 12th up to the 21st floor. During the week we have hoisted 301 cars of ore; shipped to

the Nevada mill 210 tons, and milled 210 tons; car samples average \$26.87, battery samples average \$22.34; bullion yield for the week, \$3,284. We have finished putting in new guides in the south compartment of the hoisting shaft to the 1,300 level; a portion of the north compartment also needs new guides; the work will be finished during the week, and we will start prospecting drifts on the 1,050 and 1,300 levels.

(From our Special Correspondent.)

The following is the weekly tabulated statement showing the amount of ore hoisted from Comstock mines, the average car and battery assays, bullion product for the week, etc.:

Mines.	Ore H'st'd	Car Sample Assay.	Ore M'ld.	Av. Battery Assay.	Bullion for Week.	Total.
Con. Cal. & Va....	10	\$28.20	.....	.....	.....	.....
Hale & Norcross	7 ¹	33.52	.....	.....	.....	.....
	27 ²	16.76	.....	.....	.....	.....
Potosi.....	200	21.06	200	\$25.87	.....	391 ¹ lb.
Savage....	301 ²	26.87	210	22.34	\$3,284.40	354 ² lb.

¹ Cars. ² Crude bullion.

Consolidated California & Virginia Mining Company.—Preparations have been made for commencing active operations in the mine under the direction of Mr. Rule. The Rule find is supposed to be about 40 ft. below the 1,000 level, where there is a considerable amount of virgin ground.

Kentuck Consolidated Mining Company.—At a special meeting it was decided to dispose of the 40,000 shares of stock, forfeited for delinquent assessments as follows: Each holder who has or shall pay the last assessment of 10 cents per share shall be entitled to receive seven-eighths of a share for each share of assessment paid stock.

NEW MEXICO.

Grant County.

Langston.—This mine has resumed operations.

Mammoth.—This mill, at Pinos Altos, is running steadily on Campo Santo ore, working 12 to 15 tons daily. The mine is owned by Dr. W. H. White, of Silver City, and employs 20 men.

Ohio.—This property is working 10 men and is extracting ore which is being run through Bell & Stephens mill.

Pacific.—Considerable development work is being done on this mine, and quantities of ore are being extracted. The Bell & Stephens mill is kept running steadily.

Wagner.—This mill, at Pinos Altos, is running on Golden Giant ore, which is said to average \$32 per ton. Eighteen men are employed.

Socorro County.

Cooney Mill.—This mill has been constructed to treat the sulphureted ores of the camp by the tested plan of heating the pulp, discovered by Captain Cooney in 1884, upon the ores of the old Silver Bar mine. He also intends putting in the cyanide process above the concentrating plant without disturbing the latter, and will heat the solution before applying it to the pulp, in the same manner as in concentration.

Santa Fe County.

Advices from Santa Fe announce the discovery of a strong lode of solid quartz, with a pay streak 30 in. wide, that is said to run \$134 per ton in gold. The find is at Monument Rock, nine miles up the river from Santa Fe. It is the first mineral strike made in the Santa Fe range.

OREGON.

Baker County.

Hurdy Gurdy.—At this mine, according to the Baker City "Democrat," a 200-ft. cross-cut run at a depth of 150 ft. has exposed a vein about 1 ft. in width, carrying free gold. The vein is rich enough to encourage managers to make further explorations.

North Pole Mining Company.—The tunnel at this mine, which has been in progress for several months past, is now in 968 ft., and has reached a vein at a depth of 400 ft. below the surface. The tunnel cut across the ledge diagonally and its full width and direction have not yet been determined. The company has nearly completed its 20-stamp mill and purposes putting up a plant for working ore by the cyanide process.

Pride of Pendleton.—Development work on this mine is to be continued through the winter under charge of Mr. J. Powers as manager.

Grant County.

Monumental Mining Company.—On the new tunnel, which is now 1,690 ft. in length, work is being continued. A winze has been sunk 50 ft. on the No. 7 vein, and an upraise has been run 60 ft., showing about 18 in. in width of silver ore for the whole district. The 10-stamp mill has been started up, as there is now sufficient ore in sight to run it for some time.

PENNSYLVANIA.

Anthracite Coal.

Delaware & Hudson.—This company's collieries near Parsons averaged 20 working days in October.

Lehigh & Wilkes-Barre Coal Company.—The

shipments from the Honey Brook collieries of this company for the month of October were 73,000 tons, being an increase of 10,000 over the same month last year, and one day less work. The company expects to ship upward of 600,000 tons this year.

Bituminous Coal.

A press dispatch from Huntingdon says that the bituminous coal operators in the Broad Top region, including the Huntingdon & Broad Top Railroad Company, have reduced the price of mining coal from 50 to 40 cents per ton, dating from November 1st, and ordered all their mines which have been idle for three months to start up immediately. The Six-Mile Run miners have accepted the reduction and gone to work, and it is expected that the Shoup's Run and Sandy Run miners will follow suit in a few days. This reduction may force the Rockhill Iron and Coal Company, whose mines have been operated steadily, to make a similar cut in wages.

A Pittsburg dispatch says the rise in the Allegheny and Monongahela rivers enabled the shipment of about 1,000,000 bushels of coal in light river craft November 6th. There are in the harbor awaiting shipment to points on the lower Ohio River between 25,000,000 and 30,000,000 bushels of coal.

SOUTH CAROLINA.

The phosphate situation at present, says the "Manufacturers' Record," is by no means encouraging, and possesses many features which are more or less serious on the surface. The directors of mining companies and the phosphate commissioners are far apart in their views, the former declining to operate until they can obtain more substantial relief from the State, while the latter body says that no further relief can or will be extended to alter the situation. It is not known definitely what the various companies will do in the matter of resuming operations. Everything is in a confused and unsettled condition, and the companies that sustained the greatest loss by the storm would receive the least benefit out of the conditions of the commission, if accepted. The Coosaw Company, which does the largest business in the river, is quite inactive, and has not made the first move toward resuming operations or repairing losses by the storm in August. The Carolina Mining Company has no settled plans, but efforts are being made to raise its dredge, and to do that and get it ready to operate will take five or six months. The Farmers' Mining Company went to work October 27th, having sufficient of its plant in shape to resume operations. With regard to the Beaufort Mining Company nothing definite is known relating to future operations. The company is now working on its washboats. The dredges are at work on the Savannah River digging mud, as they cannot be used in mining until the washboats are ready. It is said that the company will not resume work under the present conditions, and the stockholders are not willing to put more money into a business which they consider unprofitable. The whole phosphate situation will likely be considered at the next legislature, and until then all indications point to a season of inactivity among river miners.

SOUTH DAKOTA.

Custer County.

Globe.—This property is situated near Custer City and is owned by C. A. Haserodt and Charles Harbach, who are now sinking on the ledge, which is 7 ft. wide, between well defined walls, according to the Custer "Chronicle." The ore assays well.

Lawrence County.

Deadwood-Terra Mining Company.—According to the Deadwood "Pioneer" indications point to the resumption of operations at Deadwood-Terra mine. Within the past few days the mine pumps have been replaced and such other adjuncts necessary to begin operations. Superintendent Grier is at present in New York.

New District.—This is the name of a group of six claims situated on Two Bit gulch, in Bare Butte mining district, to which a wagon road has been built. When ready, a part of the ore now on the dump will be hauled to the Ruth & Lardner mill in Central, and the balance to the D. & D. smelter at Deadwood. The ore shoot is similar to the silicious ores of Ruby Basin, Blacktail, etc., with this difference: that free-milling and silicious ores alternate in the same shoot about every 15 ft. The free-milling portion is of a shaly nature, while the silicious is highly crystallized. This shoot is about 2 ft. thick, and is found in connection with a faulted fissure, which breaks the formation for an unknown depth. The ore lies on a stratum of porphyry, with walls and roof of shale. The quartzite exists at a depth of about 200 ft. below. Intervening are other contacts or sheets of porphyry on which it is expected similar ore shoots will be found.

Welcome Mining Company.—Mr. Thos. H. White has acquired a controlling part of the stock of this company, now holding 26,000 shares out of 50,000. The properties of the company consist of the Oriole, Welcome, Genoa, Marathon, Magenta and Terry Peak lodes and Rilando mill site, on Spearfish side of Terry Peak, and the Welcome mill site, for which government patents have been issued. Besides, there are the Protection lode and Empress Nos. 1 and 2 fractions, not patented, all the property adjoining, however, and covering an area of

87 acres, at the foot of Terry Peak. The workings consist of a shaft on the Welcome mill site, over which was located also the Protection lode. The shaft is 120 ft. deep, over which is a small but complete hoisting plant. A stope extends 300 ft. toward the south, which is 8 ft. high, and another extends to the north end line, about 100 ft. This ore shoot has averaged 50 ft. wide until recently, when it narrowed at the southern end to about 10 ft. wide. There are three other shoots opened, which are promising.

(From our Special Correspondent.)

Barlow-Wilson.—The clean-up of the 20-stamp mill for October was \$4,000. This mill is in the hands of a receiver, but this clean-up will nearly pay the company's obligation.

Hay Creek Coalfield.—A company has been formed at Dubuque, Ia., to open up the Hay Creek coalfields, situated 50 miles from Deadwood. A railroad connecting with the Northwestern, at Belle Fourche, 20 miles distant, is projected. Henry Gilman, a Chicago coalman, is at the head of the enterprise.

TENNESSEE.

Anderson County.

Cambria Coal Company.—A receiver has been appointed for the property of this company, whose mines are located near Coal Creek.

TEXAS.

Llano County.

Bessemer Development Company.—This company has secured possession of a large tract of land believed to contain iron ore, including the Olive mine, at which considerable work has been done. The company proposes to develop the property on an extensive scale.

Webb County.

Minerva Coal Company.—The receiver for this company has been ordered discharged, and the property has been turned over to Capt. Wm. Anderson, president of the company.

UTAH.

Salt Lake County.

The shipments of ore and bullion from Salt Lake City for the week ending October 28th, inclusive, were 977,559 lbs. of hullion and 671,490 lbs. of silver and lead ores. For the 10 months ending October 31st, shipments were as follows: 32,831,874 lbs. bullion; 915,545 lbs. copper matte, and 61,359,937 lbs. ores.

The receipts of ore and bullion at Salt Lake City for the week ending November 1st were to the aggregate value of \$133,238, of which \$89,659 was in hullion and \$43,579 was in ore, says the "Tribune." For the previous week the receipts amounted to \$145,923, of which \$105,923 was in hullion and \$40,000 was in ore. The receipts of Mingo hullion during the week were \$40,735; Hananer bullion, \$21,100; base hullion, \$24,800; gold bars, \$1,700; gold dust, \$1,324. Ore receipts during the week were \$7,679 in Ontario ore, by Wells, Fargo & Co., \$20,800 by McCormick & Co., and \$21,100 by T. R. Jones & Co. For the past 10 months the receipts of ore and hullion have been as follows: Bullion, \$3,723,750; ores, \$2,341,669; total, \$6,065,419.

Summit County.

Crescent Mining Company.—This company has received a small order for ore, about 100 tons, which it is filling from the first-class ore and concentrates which have been stored at the mill awaiting a market. According to the Park City "Record," the tramway will not be opened again this fall.

Daly-West Mining Company.—This company has filed articles of reincorporation. The principal place of business is Salt Lake City. The object of the company is to carry on a general mining, milling, smelting and sampling business, with all that pertains thereto. The capital stock is placed at \$1,500,000, divided into 75,000 shares of the nominal value of \$20 each. The names of the incorporators with the number of shares subscribed are as follows: John J. Daly, 74,950 shares; Eliza M. Daly, 10; O. J. Salisbury, 10; W. S. McCormick, 10; Arthur Brown, 10; Allen Fowler, 10. The officers of the company are: J. J. Daly, president; O. J. Salisbury, vice-president; J. J. Daly, treasurer; Allen Fowler, secretary. Work at this company's property in Park City is being carried on actively.

Ontario Mining Company.—On October 28th the Ontario mill shipped 48 bars of bullion containing 25,697 oz. of fine silver.

Union Concentrator.—This mill began operations last week with a force of about 15 men. Only one shift will be worked for the present. The work of stopping ore is going forward rapidly at the Anchor mine and the mill will be kept busy.

VIRGINIA.

Roanoke County.

Castle Rock Mining Company.—This company now has its iron ore mines, near Cave Spring, in regular operation, and is shipping about 200 tons of brown hematite per day, most of it going to the West End furnace, at Roanoke. The property is connected with the Roanoke & Southern Railroad by a spur track nearly three miles long. The company has erected a pumping plant to supply water for the washers, to which it is carried by a line of pipe 3,000 ft. long. The ore is carried to the

washers by a gravity road from the workings, which are on the hillside. The officers of the company are: Capt. William Welch, president; George Ramsey, secretary and treasurer; directors, R. R. Washburn, Joseph H. Sands and Thomas W. Miller.

WASHINGTON.

Kittitas County.

Rigney Mine.—This mine, on Swauk Creek, was sold recently for \$10,000 to John Black, who now has a number of men at work.

Okanogan County.

Placer miners are reported as doing well in the Okanogan district, and a number of quartz locations have also been made in that district.

Monarch Mine.—This gold claim, near Loomiston, has been bonded to A. C. Springer, of Seattle, who will extend the shaft and make milling tests of the ore. If the result is favorable a 10-stamp mill will be put in.

Ora Group.—This group of mines, near Loomiston, has been bonded by M. A. Rush and others, who own it, to H. Mainwaring, of San Francisco, for \$12,000, the bond to run 45 days.

Tough Nut Mine.—A controlling interest in this mine, near Coucouilly, was sold recently to Mr. Rust, of the Tacoma Smelting Company. A good deal of work has been done on this mine at different times. It is a silver mine, and arrangements are to be made to concentrate the ore and ship it to the smelter.

Snohomish County.

Snohomish District.—Several finds of a sulphide ore in quartz have been made in this district, near the Skykomish River. Assays show considerable gold, and the report has attracted many prospectors.

WEST VIRGINIA.

Kanawha County.

Campbell's Creek Coal Mine.—On the morning of November 3d, a coupling pin broke in a train of empty cars which was going down into this mine, and the cars ran down the incline without brakes, and into a train of loaded cars which was coming out of the mine, crushing the motor and several cars. One man was killed and another badly hurt.

WISCONSIN.

Iron—Gogebic Range.

The Ashland "Press" reports the ore shipments from that port for the present season up to November 4th, at 1,064,037 tons, of which 455,190 tons were brought over the Wisconsin Central, and 608,847 tons over the Lake Shore (now the Chicago & Northwestern). The heaviest shippers for the season were the Norrie, 228,476 tons; the Aurora, 165,615; the Tilden, 134,822; and the Pabst, 91,891 tons.

WYOMING.

Converse County.

Glen Rock Coal Mine.—These mines are now employing 125 men. Most of the coal is shipped eastward by rail to Nebraska and other points around the Union Pacific.

Ines Coal Mine.—These mines, near Douglas, are employing 100 men and are shipping coal steadily.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

East Wellington Coal Company.—The miners employed at this company's colliery at Nanaimo, British Columbia, struck on the 8th inst., because they were refused higher wages—the same as paid by the new Vancouver Coal Company. About 400 men are affected by the strike.

Eight-Mile Creek.—At this point, near New Denver, a deposit of quartz bearing free gold was recently discovered, almost the first find of the kind in Sloean.

Vancouver Coal Company.—About 1,000 men resumed work at this company's colliery, at Nanaimo, on November 6th, under an agreement providing for a 10% reduction in wages. The old scale reduced the wages 20%.

GREAT BRITAIN.

Coal Miners' Strike.—A committee of the Coal Mine Owners' Association met in Manchester, November 6th, to consider the result of the conference held last week in London between the association and delegates from the Miners' Federation. At a mass meeting of the miners at St. Helen's, Lancashire, held on the same day to consider the proposals made by the masters at the London conference last week, it was decided not to accept the proposals, which were that a board of conciliation be appointed and that the miners return to work at a 15% reduction in wages pending the decision of the board of conciliation. In the meantime the 18% difference between the wages demanded by the miners and the wages paid them was to be placed in bank, and if the wages question should be decided against the masters then the money would be distributed pro rata among the men.

INDIA.

Hyderabad-Deccan Company.—The difficulties which have existed in relation to the lease by this company of the Singarini coal fields have been finally settled and the necessary documents executed. The

company has now for the first time a well defined lease at a settled rate of royalty and will proceed to work the mines on a large scale.

NEW GUINEA.

Late reports from this island given by the "Queenlander" say that in September, at Sudest and St. Aignan about 100 men were sluicing for gold with payable results. The three Californian hydraulic miners who had visited the fields with the view of introducing hydraulic mining on a large scale have returned, and report that the prospects were not sufficiently good to induce them to embark on the enterprise.

NEW SOUTH WALES.

The White Cliff Opal Field, according to the Sydney "Herald" is attracting considerable attention at present. There are 350 men on the field, and a number of mineral leases have been taken out. The Wilcannia Opal Mining Company has 60 triphibutors working on the claims, and the result in September was the finding of opal valued at about \$5,000.

NOVA SCOTIA.

Antigonish.—On this mine, at Country Harbor, a large amount of prospecting and development work is being done. The mill has been improved by putting in a new engine and boiler and a rock breaker and increasing the speed of the 15-stamp mill.

Gold River Gold Mining Company.—This company is now working the old Neptune property on Gold River, near Chester. Fourteen men are employed and some good ore has recently been struck.

Richardson Gold Mine.—In this mine, at Isaac's Harbor, 25 men are now employed and the 20 stamp mill has been running steadily for some time past. The output for last month is reported as 263 oz. of gold.

ONTARIO.

Ophir Mining Company.—This company, whose mines are situated in Galbraith Township, in the district of Algoma, will shortly begin active work, and has purchased from Fraser & Chalmers, of Chicago, a 20-stamp mill; it has 850-lb. stamps arranged in groups of five. The mill will also have a set of amalgamating plates and eight Frue vanners for concentrating the ore. The vein is of quartz, between syenitic rocks, and carries some free gold with a small amount of telluride of gold and some iron and copper pyrites. The vein outcrops on the property for a distance of 450 ft. Several cuts have been made and a shaft sunk 100 ft. An incline shaft sunk 90 ft. on the vein shows good ore all the way down. This incline will intersect the vertical shaft if carried a short distance further. It is estimated that there is a large amount of ore in sight. A recent shipment of 1,125 lbs. of ore to the Michigan Mining School, at Houghton, gave a result of 1.80 oz. silver and 3.50 oz. gold to the ton.

QUEENSLAND.

Tate Alluvial Tin Mining Syndicate.—At the annual meeting in Brisbane, recently, the chairman said that the work in the mines had had to be stopped for some time as the capital was locked up in the bank of North Queensland when that institution suspended payment. Now that the current balance had been released, it was intended to immediately construct a race in order to bring the waters of the Tate River on to the ground. The mineral could then be worked conveniently and economically. The lease had been abandoned and taken up again. There was an area of about 90 acres in the company's property the greater part of which was tin-bearing; during last summer 25 tons of tin had been obtained from a quarter of an acre of land. Mr. Bell, the company's manager, was on the field, and arrangements had been made for constructing the race both by day labor and by contract.

SOUTH AFRICA.

Cape Colony.

Cape Copper Company.—The report for August states that in the Ookiep mine the stopes are yielding very well. In the Spectakel mine the rock developed by the new cross-cut has been chiefly barren ore with occasional bunches of copper ore, but nothing of much value, and it is to be abandoned and another level run in a southeast direction. In the Copperberg mine the west cross-cut shows nothing and has been abandoned, but the south crosscut is yielding very well.

TURKEY.

Heraklea Coal Mines.—A syndicate of French financiers, headed by Baron de Nervo, has asked the Turkish Government for a concession to work the mines at Heraklea. The syndicate promises to develop the mines and to increase the output of coal largely.

WESTERN AUSTRALIA.

Coolgardie Gold Field.—The latest notes received from Australia state that the prospects are favorable as far as the veins are concerned, several new ones having been discovered. On the other hand at least two deaths from starvation are reported. A letter published in an Australian paper from a Bendigo miner who has tried the new field says that the prices of provision and water are exorbitant, and that there is great suffering among the men on the ground. Some of them have made money, but acknowledge that they would be better off almost anywhere else, as the cost of living eats up everything, and even at the high prices it is hard work to secure enough to sustain life.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 10.
Statement of shipments of anthracite coal (approximated) for week ending November 4th, 1893, compared with the corresponding period last year:

	1893. Tons.	1892. Tons.	Difference.
Wyoming region.....	520,244	482,170	Inc. 38,074
Lehigh region.....	168,900	143,380	Inc. 25,540
Schuylkill region.....	291,559	261,920	Inc. 29,639
Totals.....	980,703	887,450	Inc. 93,253

Total for year to date... 36,284,743 35,209,357 Inc. 1,075,386

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending November 4th and year from January 1st:

Shipped East and North:	1893.		1892.
	Week.	Year.	Year.
Phila. & Erie R. R.....	765	68,825	77,641
Cumberland, Md.....	89,282	3,520,376	3,240,355
Barclay, Pa.....	435	40,713	38,619
Broad Top, Pa.....	8,693	497,155	530,973
Clearfield, Pa.....	70,954	3,235,367	3,365,365
Allegheny, Pa.....	24,095	1,656,727	1,688,816
Beech Creek, Pa.....	41,720	2,377,124	1,941,587
Pocahontas Flat Top.....	60,922	2,365,289	2,227,213
Kanawha, W. Va.....	86,778	2,760,304	2,109,916
Totals.....	383,632	15,922,080	14,640,485

* Week ending Oct. 28.

Shipped West:	1893.		1892.
	Week.	Year.	Year.
Pittsburg, Pa.....	25,750	1,022,916	1,073,465
Westmoreland, Pa.....	31,833	1,386,241	1,474,484
Monongahela, Pa.....	16,742	596,995	563,004
Totals.....	74,325	3,206,152	3,110,953
Grand totals.....	457,957	19,128,232	17,750,438

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending November 4th, 1893, and year from January 1st, in tons of 2,000 lbs.: Week, 39,569 tons; year 3,459,945 tons; to corresponding date in 1892, 4,567,624 tons.

Anthracite.

The anthracite coal trade is very dull. Consumers show a marked disinclination to buy coal just now, which is based on the belief that prices will be shaded if they keep away from the market long enough to bring about an accumulation of stocks, which shall make sellers more willing to grant some concessions. In this policy buyers have been aided by the mild weather which has prevailed of late and by the exceedingly large output of the past six weeks. Prices are reported to be fairly steady; the companies declare that they are adhering closely to the circular rates. Now and then we hear of reduced prices, but it is generally a case of an inferior grade of coal, which it is necessary to offer some inducement to market at all.

Business has been so light that there has not been much opportunity for any cutting of prices. Producers state that the lack of confidence in the future which is displayed by buyers is unfounded, and that such as are holding off in expectation of lower prices will be disappointed, as it is intended to curtail production to such an extent that it will be impossible to accumulate excessive supplies. Be this as it may, the consumer just now seems to hold the winning hand, and he is perfectly justified in buying as little as possible. There will not be any scarcity of coal, and it is not likely that prices will go any higher, whereas there is always the possibility that lower values may rule later on.

Perhaps the only topic of interest in the trade this week was the final and definite organization of the "Anthracite Coal Operators' Association." This association comprises sixty of the most important independent operators, whose combined output last year aggregated 11,345,000 tons. Officers have been elected as follows: William Connell, of Scranton, president; E. B. Leisenring, of Philadelphia, vice-president; C. D. Simpson, of Scranton, secretary and treasurer. The board of managers consists of E. B. Leisenring, E. B. Ely, L. A. Riley, W. G. Payne, John Jermy, O. S. Johnson, Wm. Connell, C. D. Simpson, Frank T. Patterson, J. S. Wentz, A. H. Howe and Charles Parrish. This board meets once a month.

The Executive Committee consists of E. B. Ely, Frank T. Patterson, Lewis A. Riley, together with the secretary and treasurer.

One of the officers of the Association stated: Ours will be a mutual benefit association. We will meet four times a year and will discuss matters of general interest. I can not say that we have decided upon any one plan to benefit ourselves, but we certainly think that our combined interests will be a factor of such vast importance in the anthracite coal trade that united action on our part will insure from the railroads, for instance, a respectful hearing, and probably compliance to any reasonable requests which we may make. We feel that we are entitled to this. We do not propose to "regulate" prices or to "dictate terms" to any one, but there are many things of advantage to us which we can do now that we have a definite organization. Difficulties are always arising in this as in other lines of business, and they can now be settled amicably.

For one thing the Association will insure a proper and impartial curtailment of output. One operator will not be favored more than another by the railroads.

The Reading official circular rates, subject to the usual commissions, are as follows, f. o. b. at its New York harbor shipping ports:

	Broken.	Egg.	Stove.	Chestnut.
Hard white ash.....	\$4.00	\$4.25	\$4.00	\$4.60
Free white ash.....	3.90	4.15	4.60	4.60
Shamokin.....	4.50	4.80	4.60	4.60
Schuylkill red ash.....	4.50	4.95	4.75	4.75
Lykens Valley.....	5.15	5.80	6.25	5.50

Pea, \$2.50@2.75; No. 1 Buckwheat, \$1.80@2; No. 2 Buckwheat, \$1.50@1.80.

The Reading Railroad reports that its coal shipment (estimated) for last week, ending November 4th, was 280,000 tons, of which 40,000 tons were sent to Port Richmond and 35,000 tons to New York waters.

Bituminous.

The soft coal trade continues dull. Orders are quite scarce both on contracts and otherwise. The dullness has reached such a point that a meeting of prominent bituminous men, comprising the members of the old Seaboard Soft Coal Association, has been called for early next week, for the purpose of formulating plans for the improvement of the trade, or to adopt plans leading to this end which have already been formulated. Prices are so low and the net profit on soft coal so small that producers have been forced to take this step in order to ameliorate their condition. A representative of one of the biggest producers stated in an interview: The net cost and the net price of soft coal are too close to each other to permit producers to continue to mine coal. This is borne out by the number of producers who have either shut down their mines or reduced their shipments. There has been no change in miners' wages during the season at the various regions, and the main line railroads are still maintaining the regular tariffs named at the beginning of the season. Their stand on the matter is such that it looks as if these rates will be continued until the beginning of next season, and new rates named for the coming year. This leaves any reduction in price to come solely from the pockets of the producers.

The only bright spot in the soft coal trade is the all-rail business. Shipments in this line are very good, and the prices are better than those which obtain at the seaboard.

Vessels have been scarce, but they are beginning to be in better supply again. The high prevailing rates have had the effect of driving some business out of the market temporarily, as was foretold in this column some time ago. On account of the prevailing hard times every cent counts, for consumers are anxious to pay as little as possible for their fuel. Rates from Philadelphia for coastwise vessels are as follows: To Boston, Salem and Portland, \$1; Providence, New Bedford, New Haven and Bridgeport, 90c; Portsmouth, \$1.10; Wareham, \$1.10; Lynn, \$1.25; Haverhill, \$1.60. From Baltimore, Newport, News and Norfolk rates are 10c higher.

Cars are in good supply. The vessels are giving 5c. for the purpose of securing quick loading and discharging. The transportation from and to tide is very good, as well as to all rail points.

NOTES OF THE WEEK.

The Retail Coal Exchange will hold a meeting to-night. Some time ago a weight committee was appointed and an inspector empowered to weigh the coal at the place of delivery under the authority of the purchaser. A majority of the dealers, who are members of the Exchange, were in full sympathy with this movement, but others were not, preferring to leave the question to the Legislature, so that a State inspector should be appointed. The exchange, however, decided to go ahead and organize the system, and when the Legislature did appoint inspectors they would have a system arranged which would satisfy all. F. R. Crowell was appointed inspector, and it was arranged to supply him with all the conveniences for weighing according to the standard scale. Several of the members object to the manner in which the committee carried out its work. They say that the committeemen talked for the newspapers in such a manner as to further their own interests in the trade. President Muller was displeased with this state of affairs, and ordered the secretary, J. Pangburn, Jr., to send out a call for a special meeting to consider the subject. Secretary Pangburn is a member of the Executive Committee, and declined to send out the notice as desired by President Muller. Then the president went to Charles F. Davies and M. Ehrenreich, the vice-presidents, and they joined him in sending out the following notice:

NEW YORK, Nov. 6, 1893.

Dear Sir: As the secretary of the exchange has refused to send the following notice, the undersigned join in sending same:

The president calls for a special meeting to be held Friday, November 10th, at 8 p. m., at Exchange Building, to discuss the manner in which the Short Weight Committee have advertised themselves to the detriment of the other members of the exchange, and also to discuss the sending of misleading circulars.

LOUIS MULLER, President.

CHAS. F. DAVIES, First Vice-President.

M. EHRENREICH, Second Vice-President.

Buffalo.

Nov. 9.

(From our Special Correspondent.)

The market for anthracite coal is unchanged with regard to supply, demand and quotations. Incidents of trade practically few to report. As is usual at this time of the year, shippers are sending all the coal they can westward by lake, and as a result freights have been advanced to 60c. to Chicago and Milwaukee and 40c. to Duluth and Lake Superior

ports; to other distant points higher rates were secured without any trouble. The crowded condition of the harbor prevented quick dispatch in handling, so that many vessels left light rather than wait their turn.

The bituminous coal trade fairly good from manufacturers, and tug and vessel men ready buyers. Prices are firm and satisfactory to producers and dealers. Occasionally a lot is shaded to save demurrage charges.

About 2 A. M. on Monday the propeller "Philadelphia" came into collision with the propeller "Albany" in a dense fog off Point-aux-Barques, Lake Huron. Within an hour both vessels sank in 200 ft. of water. The "Philadelphia" had on a cargo of coal and merchandise intended for Duluth; the "Albany" was bound down with grain.

The shipments of coal westward by lake from Buffalo from October 30th to November 5th both days inclusive aggregated 117,759 net tons, distributed as follows: 59,050 tons to Chicago; 27,350 to Milwaukee, 13,200 to Duluth, 3,700 to Toledo, 1,000 to Superior, 450 to Sarnia, 1,250 to Detroit, 484 to Windsor, 700 to Gladstone, 2,100 to Marquette, 3,200 to Sheboygan, 1,100 to Saginaw, 1,200 to Ashland, 1,500 to Cheboygan, 225 to Marine City, 1,000 to Racine and 250 to St. Clair.

The rates of freights were 50c. to Chicago, Milwaukee and Sheboygan; 35c. to Duluth, Marine City, Superior, Cheboygan and Green Bay; 40c. to St. Clair, Sarnia and Saginaw; 75c. to Racine; 25c. to Toledo, Detroit, Ashland and Windsor, and 40c. to Gladstone and Marquette.

Closing firm, with upward tendency and a good demand for vessels.

The following statistics were prepared by Mr. William Thurstone, the secretary of the Buffalo Merchants' Exchange, showing the coal trade of that port thus far this year as compared with preceding years:

Railroad receipts and shipments of coal at Buffalo are not reported by request. Receipts of coal thus far this season by lake, none. Shipments of coal by lake westward for month of October, 359,465 net tons, as compared with 546,523 net tons in 1892 and 355,370 net tons in 1891; for the season to November 1st, 2,189,707 net tons, as compared with 2,344,432 net tons in 1892 and 2,043,050 net tons in 1891. The receipts of coal by canal for the month of October were 10,683 tons, as compared with 20,616 net tons in 1892 and 192 net tons in 1891; total receipts for the season to November 1st, 66,045 net tons, as compared with 46,829 net tons in 1892 and 817 net tons in 1891. The shipments of coal by canal for the month of October, 3,727 net tons, as compared with 3,570 net tons in 1892 and 4,414 net tons in 1891. The total shipments for the season to November 1st, 17,611 net tons, as compared with 25,577 net tons in 1892 and 28,741 net tons in 1891. The aggregate shipments of coal by lake this year to November 1st, as compared with 1892, show a decrease of 154,725 net tons, and as compared with 1891 an increase of 301,382 net tons. The rates of freight on coal from Buffalo to points named by lake vessels during the month of October were: 25@35c. to Chicago and Milwaukee; 35c. to Green Bay; 15c. to Duluth and Lake Superior ports; 20c. to Detroit and Toledo; 50c. to Racine. A year since the rates were: 65@75c. to Chicago; 60@70c. to Milwaukee; 25c. to Duluth and Lake Superior ports; 60@70c. to Green Bay; 25c. to Detroit and Toledo; 70@80c. to Racine.

Chicago.

Nov. 8.

(From our Special Correspondent.)

Signs of the close of navigation are everywhere to be seen on the Chicago River. Coal carriers are being dismantled and made snug for the coming weather and many steamers have made their last trips for the season, which taken as a whole has not been a profitable one to vessel owners—some claim that disbursements have exceeded receipts. Coal charters show a sharp advance from Buffalo to Chicago—50c. to 60c. and 40c. to Duluth—and a further advance is looked for this week; should the weather hold up, shippers here expect to be enabled to get forward considerable tonnage before lake ice makes its appearance.

Anthracite coal in all lines remains very quiet, the steady continuance of mild weather acts as a complete bar to any activity. The reports made weekly to this "Journal" for some time past evidence the fact that a large amount of business is in abeyance and is yet to be placed, this coupled with statements from traveling salesmen that there is little or no stock in the smaller towns throughout the West and Northwest, leads to the conclusion that it can be only a question of a few days before trade must become active. Even small lots of two or three cars, the orders being scattered over a wide extent of country, will create a demand for cars which will cause some considerable hustling to get together. When demand becomes fairly started it will be continuous throughout the winter and spring. Some shippers claim that their present business is fully as large in tonnage as last year, though, on the whole, they are behind for the season. Confidence between seller and buyer does not improve to any extent, and new business is very carefully scrutinized and full inquiry made before filling—in some cases payment is exacted before delivery; this applies alike to bituminous as well as anthracite for the country. Circular rates are now more steadily maintained in all classes of trade. City retail hard coal is moving in a moderate way only, and is very largely of a light character as regards individual tonnage.

Circular prices are at the following rates: Lehigh lump, \$6.25; large egg, \$5.85; small egg, range and chestnut, \$6.10. Retail prices per ton are: Large egg, \$6.75@7; small egg, range and chestnut, \$7@7.25.

Bituminous coal is in growing demand; receipts and shipments are steadily increasing, and while there is as yet no great activity, business as reported by the larger operators is good. The tonnage of Hocking shipped during October is in excess of that of a year ago, and was on the whole more easily accomplished. The Indiana and Northern Illinois coal handled in this market shows a very fair increase considering the general depression, and the outlook is most satisfactory. Several large contracts are reported as closed by local shippers with railroads, one for the Lake Shore & Western, covering 60,000 tons of Ohio coal, running over a year. There is little stock in the country towns in the West and Northwest positively dependent on this market for supplies, and money is too scarce to lay in any, so that shippers are concerned as to the available cars to furnish the fuel when demand becomes brisk, as it must do shortly. Prices are very generally adhered to, with here and there a cut to clear demurrage charges. Prices of bituminous per ton of 2,000 lbs. f. o. h. Chicago are: Pittsburgh, \$3.25; Hocking Valley, \$3.35; Youghiogheny, \$2.25; Illinois lump, \$2.70; Brazil block, \$2.25.

Coke is in moderate demand, and some of the larger handlers of Connellsville note a fair increase each week. Crushed domestic coke is in good demand, and deliveries slow from ovens. Quotations are: \$4.10 furnace; \$4.35@4.40 foundry, crushed; \$4.40 Connellsville. West Virginia: \$3.90 furnace; \$4.10 foundry. New River: Foundry, \$4.40. Walston, \$4.10 furnace, \$4.35 foundry.

Pittsburg. Nov. 9.

(From our Special Correspondent.)

Coal.—There was a small shipment of coal by the Ohio River during the week; it was loaded in flats and light barges. All told it would probably reach 1,000,000 bushels; whether it will reach its destination will be learned later. The supply of Pittsburgh coal in the lower markets is exceedingly light. The convention of river coal miners at Coal Center was even a greater fizzle than the one held at Monongahela City; only 10 delegates showed up, and there is nothing now to prevent the complete demoralization of the mining rate in the entire river district. It was the opinion of the delegates that the price of mining would be reduced to 1½ cents everywhere, now that there would be no agreement among the miners to restrain the operations. The miners are very much discouraged with their prospects, for even if a rise should come the amount of coal already loaded would so glut the Southern markets as to preclude the possibility of much coal being mined this winter.

Connellsville Coke.—Shipments as compared with the preceding week show a falling off of a few points; this, however, is nothing unusual. The Cambria Iron Company fired 150 ovens at its Morrell works, near Dunbar; these are the first to be fired in the region for several weeks. A number of other works will start as soon as sufficient water can be had; the recent rains have enabled a number of coke plants in the Uniontown region to resume after several months of idleness. The Hill Farm plant of the Dunbar Furnace Company, 250 ovens, employing 150 men, and Leisening No. 2, 400 ovens, employing 300 men, have resumed; Leith and Broomfield in part; the Stewart and many others will be making coke in a few days. Before the close of the week several thousand additional ovens are expected to be in operation. Week's shipments aggregated 51,300 tons, distributed as follows: To Pittsburgh, 1,300 cars; points east, 800 cars; points west, 750 cars; total, 2,850 cars. The Western shipments decreased 50 cars; Eastern increased 65 cars, while Pittsburgh decreased 100 cars, sharing net decrease 85 cars. Present rates for various kinds are: Furnace coke, f. o. b. cars at ovens, \$1.35 per ton; foundry coke, f. o. b. cars at ovens, \$1.65 per ton; crushed coke, f. o. b. cars at ovens, \$1.75 per ton. Add 70c. per ton and you have the price of coke delivered at Pittsburgh.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Nov. 10, 1893.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Nov. 11, 1892.	Nov. 10, 1893.	Jan., '92	Jan., '93.	Jan., '92	Jan., '93.
Anthracite.	70	29,810	34	13,450	1,493,532	1,264,141
Coke.	128	120,650	53	54,800	5,939,634	4,919,213
Charcoal...	43	9,640	28	5,690	464,217	351,776
Totals...	241	160,100	115	75,940	7,897,433	6,538,130

Pig Iron.—Although more encouraging reports are coming from the various iron centers of the country, it cannot be said that this market has shown any noticeable improvement. Prices here are neither higher nor firmer, and the demand has undergone no appreciable increase. Consumers persist in their policy of a hand-to-mouth buying and desirable cash offers for pig iron are accepted by the furnaces with as much eagerness as ever. We have all along contended that the recovery of this market would be gradual, and that it would be

many months before any actual improvement would manifest itself. What is really encouraging is the fact that the general business situation throughout the country is commencing to show unmistakable signs of improvement. By this return of confidence and an easier money market the pig iron market will be benefited. The production increased slightly during October and stocks decreased somewhat, so that it is evident that the country at large is consuming more iron, even if this does not hold true of our local market. The tide-water prices of the Thomas Iron Company are as follows: No. 1, \$14.50 per ton; No. 2, \$13.50; No. 3 or No. 2 plain, \$12.75. For regular brands we quote as follows: Northern brands: No. 1, \$13.75@14.25; No. 2, \$12.50; gray forge, \$12. For Southern iron we quote: No. 1, \$13@13.75; No. 2 F., \$12@12.50; No. 1 soft F., \$12@13; gray forge, \$11@12—all at tide-water. Scotch irons are quoted: Coltness, \$21.50@22; Eglington, \$19.50@20; Summerlee, \$21.50@22.

Billets and Rods.—We do not hear of any sales of importance in either billets or rods. Prices are still unprecedentedly low, and actual figures are considerably below the nominal quotations. As near as we can ascertain domestic hillers may be quoted at \$18@20, and foreign billets \$28@29, tide-water. Wire rods, domestic, \$28@29; foreign, \$39@40, tide-water.

Manufactured Iron and Steel.—Some sales are reported this week, but on the whole this market shows no new features of interest. Prices are unchanged, and we quote this week: Angles, 1.75@1.9c.; axles, scrap, 1.80@2.1 delivered; steel, 1.75@2c.; hars, common, 1.40@1.50c.; refined, 1.50@1.85c. on dock; beams, up to 15 in., 1.70@2c.; 20 in., 2.00@2.25c.; car truck channels, 2@2.10c.; channels, 1.85@2c. on dock; steel hoops, 1.8@1.9c.; delivered; links and pins, 1.70@1.80c.; plates, flange, 2@2.10c.; firebox, 2.5@2.8c.; flange, 2.10@2.25c.; marine, 2.50@2.75c.; sheared, 1.85@2.10c.; shell, 1.75@1.95c.; tank, 1.65@1.85c.; universal mill, 1.70@1.90c.; tees, 2@2.15c., all on dock.

Merchant Steel.—Some business is reported in this market, but, all in all, it continues quiet and without especial features. Quotations are unchanged from last week, as follows: Tool steel, \$6.50@6.75 and upward; tire steel, \$2@2.10; toe calk, \$2.30@2.40; Bessemer machinery, \$2.10@2.20. Bessemer bars, \$1.60@1.70; open hearth machinery, \$2.25@2.30; open hearth carriage spring, \$2.10@2.20; crucible spring, \$3.75@4.

Old Material.—There is little demand for old material of any kind, and in the absence of actual sales upon which to base prices, quotations must be regarded as nominal. We quote: Old iron rails, \$13@14; old steel rails, \$8@10; wrought scrap, \$9@10.

Rail Fastenings.—Very little business is reported in this market. Quotations are nominally: Fish and angle plates, \$15@15.80 at mill; spikes, 1.80@1.90c.; bolts and square nuts, 2.25@2.45c.; hexagonal nuts, 2.45@2.60c., delivered.

Spiegeleisen and Ferromanganese.—There is nothing new to report of either spiegel or ferromanganese. Prices continue low. Quotations are nominally as follows: 10 to 12% Spiegel, \$22@22.50; 20% \$25@25.50. Ferro, \$56@57.

Steel Rails.—There have been numerous reports of very low prices for steel rails during the past week. Pittsburgh advices are that \$24 has been openly named by the Carnegie Steel Company, and that efforts are making to secure as much Eastern business as possible. Agents of Eastern mills in this city deny that such low prices have been made in this market, and the lowest figure that could be offered here was \$27. However, as the "Engineering and Mining Journal" stated some time ago, the price of steel rails has ruled lower than any mill man was willing to acknowledge, and it has been an open secret that when a sale at \$20 was made it was more than likely to have a "string" attached thereto which made the actual net price for rails reach a much lower figure. It is impossible to say at just how low a price steel rails could be purchased to-day.

Tubes and Pipe.—Some business is reported, but on the whole this market continues quiet. Ruling discounts on carload lots are as follows: Butt, black, 57½, 10 and 5%; butt, galvanized, 50, 10 and 5%; lap, black, 67½, 10 and 5%; lap, galvanized, 57½, 10 and 5%.

Buffalo. Nov. 9.

(Special Report of Rogers, Brown & Co.)

The only new feature since our last report is the sweeping Republican victories. We quote for cash f. o. h. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, \$13.50; No. 2 X foundry strong coke iron, Lake Superior ore, \$13; Ohio strong softener No. 1, \$13.75; Ohio strong softener No. 2, \$13.25; Jackson County silvery No. 1, \$16.80@17.30; Jackson County silvery No. 2, \$16.30@16.80; Lake Superior charcoal, \$15.75; Tennessee charcoal, \$16; Southern soft No. 1, \$13.15; Alabama car wheel, \$18; Hanging Rock charcoal, \$20.50.

Chicago. Nov. 8.

(From our Special Correspondent.)

The market generally continues uninterestingly dull, not only in crude iron, but in manufactured material also. Manufacturing concerns generally using large amounts of raw and finished iron and steel are taking minimum quantities only, and many of the smaller firms are getting their supplies from jobbers. Intense conservatism prevails just

now among consumers of iron, and a continuance of this policy may be expected until the present uncertainty and hesitation are cast aside for broader gauged ideas, so that while there may be a better tone to the market, it has not as yet led to any increase in business.

Pig Iron.—The carload trade is now a strong feature in local coke iron and is none too active. Orders to any size are strange to this market, and instances are rare where they exceed 100 or 200 tons. Early this week a better inquiry developed, but this is probably made with a view to keep in touch, and may not result in business. Consumers continue to supply their wants very cautiously, and foundries which are running are indisposed to purchase iron until orders are safely hooked. Southern coke iron agents are a unit in declaring the market dull and featureless. Even carload orders are few, and there is little in the inquiry which would indicate any improvement. Lake Superior charcoal iron is reported in moderate demand in carloads from furnace at good and remunerative prices. The hypothecated iron held by hanks sells at about \$2 less than our quotation prices: Quotations per gross ton f. o. h. Chicago are: Lake Superior charcoal, \$15.50@16.00; Lake Superior coke No. 1, \$13.50@13.75; No. 2, \$12.75@13.25; No. 3, \$12.25@12.50; Lake Superior Bessemer, \$14.00; Lake Superior Scotch, \$14@14.50; American Scotch, \$15.50@16.00; Southern coke, foundry, No. 1, \$13.50; No. 2, \$12.00; No. 3, \$11.50; Southern coke soft No. 1, \$11.75; No. 2, \$11.50; Ohio silversies No. 1, \$16.50; No. 2, \$16.00; Ohio strong softeners No. 1, \$16.25; No. 2, \$15.75; Tennessee charcoal No. 1, \$16.50; No. 2, \$16.00; Southern standard car wheel, \$18.25@18.75.

Structural Iron and Steel.—A new library building for Milwaukee, Wis., and several public buildings in other outside cities will soon be in the market. Nothing new worthy of note locally. Bridge plates are in better demand from railroads, and a fair tonnage placed last and early this week. Quotations, car lots, f. o. h. Chicago, are as follows: Angles, \$1.70@1.80; tees, \$1.85@1.95; universal plates, \$1.70@1.80; sheared plates, \$1.75@1.85; beams and channels, \$1.75@1.85.

Plates.—The local hoiler trade is very quiet, and were it not for the increased inquiry from outside points agents would have little to figure. Steel sheets, 10 to 14, \$2.25@2.35; iron sheets, 10 to 14, \$2@2.10; tank steel, \$1.90@2; shell iron or steel, \$2.50@2.75; firebox steel, \$1.25@1.5; flange steel, \$2.74@3; boiler rivets, \$4@4.15; boiler tubes, all sizes, 65%.

Merchant Steel.—As the season progresses buyers appear more anxious to place contracts for soft and special soft steels, and a fair tonnage was booked for the implement trade last week, though in nearly all cases the amount taken is less than last year. Jobbers are also buying more freely to supply the smaller manufacturers who take less than carloads. Quotations are: Tool steel, 6.50@6.75c. and upward; tire steel, 1.85@1.90c.; toe calks, 2.20@2.30c.; Bessemer machinery, 2.05@2.15c.; Bessemer bars, 1.70@1.80c.; open hearth machinery, 2.10c., open hearth carriage spring, 2.10@2.20c.; crucible spring, 3.50@3.75c.

Galvanized Sheet Iron.—Stocks in agents' warehouses are badly broken on account of slow delivery from mills, some being still shut down in that department. Discounts are easy at 70, 10 and 7½% off on Juniata and 70, 10 and 10% off on charcoal and jobbing quantities at 70 and 7½% off on the former and 70 and 10% off on the latter.

Black Sheet Iron.—Mill orders are scarce for either light or heavy sheets, and deliveries continue slow. Carlots are quoted at 2.70@2.75c. for No. 27 common. Jobbers quote 2.95@3c. for same gauge for iron, and steel sheets are about 10c. higher per 100 lbs.

Bar Iron.—Most of the buying is that being consummated by the implement makers and at prices which discount the tariff. Selling agents of local mills quote 1.40c., though those figures are shaded according to specification. Jobbers report demand fair from warehouse at 1.60@1.70c. for iron and steel bars in less than carloads.

Billets.—Small lots of billets are selling at \$20. The soft steel department of the Joliet, Ill., steel plant will resume November 20th.

Steel Rails.—Probably no branch of the steel trade is so dull as this. Orders for small quantities continue to be filled from stock at \$30@31. Our jobbing orders are noted for track repair supplies.

Nails.—Wire nails have been further reduced and \$1.30 is easy for mill lots f. o. h. Chicago. Jobbers quote \$1.40@1.45 from stock. Steel cut nails are in moderate demand from mill in car lots, and we note a sale of 10,000 kegs to a river point in the South-Water route. Mill quotation is easy at \$1.20 on a 55c. average; jobbing price \$1.35.

Scrap.—Demand is confined to carloads and quotations are merely nominal. Railroad, \$11.00; No. 1 forge, \$11; No. 1 mill, \$7.50; fish plates, \$12; cast borings, \$4.50; wrought turnings, \$7.50; axle turnings, \$7.25; machinery castings, \$9; stove plates, \$6.50; mixed steel, \$7; coil steel, \$14; leaf steel, \$14; tires, \$13.50.

Old Material.—Small sales of iron rails are being made at less than \$14. Old steel rails are in light demand at \$10@12.25, according to condition, etc. Car wheels are nominally quoted \$12.

Philadelphia.

(From our Special Correspondent.)

Pig Iron.—The iron trade has reached a turning point. No marked improvement in demand has taken place, because a great many buyers have secured options in writing, from makers of pig iron, for supplies at certain prices, within a certain time. Should there be a hardening tendency in the market, these options will be taken advantage of. The fact that stocks are very low in consumers' hands is to-day assigned as a reason why buying will soon set in. As banks are now more freely discounting paper, winter requirements will be covered with four-months notes, very probably. This will most likely result in an improving demand for both foundry and forge iron before the close of the month. Good brands of No. 1 have been offered to-day at \$14.25; good brands of No. 2 at \$13, and most forge iron can be had at \$12.

Steel Billets.—Conditions are improving in steel billets. Offers of large lots were made on Monday and Tuesday in this market, at \$19.75. So far as known not one of the offers was taken. The only buyers now in the market are those who take small lots which go out at from \$20 to \$20.50. One or two makers refuse to solicit business, and say they will not be in the market until they can get \$21.

Merchant Iron.—Three or four mills have resumed this week. Some others will soon start up. There is a larger amount of business coming in. At the same time, there is no general improvement. Refined bars range from 1.50 to 1.55. The prospects are brightening for a larger business later in the month.

Nails.—One or two factories that have been idle for some time are about starting up. The stocks of nails are very large. Carload lots at mill are offered at \$1.

Skelp Iron.—The nominal price is 1.45. Brokers have refused to take less. Offers have been made at 1.35, and possibly 1.40 may be taken. Trolley line requirements are coming in.

Sheet Iron.—Quite a number of orders for heavy sheets have just been booked, and others are likely to follow. Light sheets are inquired for occasionally. Stove manufacturers have been looking around the market with a view of adding to their purchases for winter supplies.

Plate and Tank.—An improving tone is reported by several brokers representing plate and tank mills. The improvement does not consist in additional orders, but in the opening up of new work for which material will soon be wanted. The plate mills have been coming through some very hard times. Negotiations are in progress, but it is simply impossible to get the quotations which have been named. It is thought that tank has been offered at 1.50; it is certain that there has been a strong shading on all usual quotations. This is due to offerings from Western makers here.

Structural Material.—A good deal of iron is wanted for city buildings, here and farther east. The amounts, according to one or two authorities, will reach 5,000 tons; but it is not known to-day whether all of that quantity will be contracted for when the first batch of orders is given out. It would be interesting to know the figures, but they cannot be had.

Steel Rails.—A great deal is said in trade circles to-day about the cut in prices made in western Pennsylvania, where it is reported by telegraph rails are selling at \$22.50. Perhaps by another week, reliable quotations can be given; but there are too many rumors of quotations ranging from \$24 to \$27 to warrant a statement as to what actual prices are.

Old Rails.—There are large offerings, but very few sales. Quotations, \$14 for iron. Street rails, \$15.50.

Scrap.—Scrap is plenty, and can be had at \$12 for No. 1; machinery, \$10, delivered.

Pittsburg.

Nov. 9.

(From our Special Correspondent.)

Raw Iron and Steel.—The general outlook for business is steadily improving, and the iron men are beginning to talk business in earnest. While there have been no very heavy transactions, the general inquiries being far more numerous leads producers to hope that the worst is over and that even if prices should not rule higher during the balance of the year a firmer tone will take the place of the weakness and irregularity which have been the prevailing conditions for so many months past. On the other hand prices will certainly be governed by the supply and demand; should the latter increase to any perceptible extent advance in prices will be certain to follow. One good feature is very noticeable—confidence is steadily increasing; when that is fully established we may look for that activity in trade we have been so long waiting and wishing for, and an upward movement in prices. Without exception, the iron men visited all agreed that bottom prices had been reached; mills and foundries at various points have started up, others are making the necessary preparations and will soon be in full operation; this, of course, means an increased demand for raw material. Stocks in first hand have been reduced to very limited amounts, as many of the furnaces have been closed down for some time, and will not start until the prospect brightens.

Of course we are not looking for a big "boom" in

prices; in fact we don't want one, as they are generally injurious to business. What we do want is a gradual improvement, prices to steadily advance so that no excitement will be raised, and dealers will take the right view of the situation.

Coke Smelted Lake and Native Ore.

Tons.	Cash.	Nov.	Dec.
3,000	Bessemer, Nov.		\$11.50
	Dec.		
1,500	Bessemer, Nov.		\$11.25
	Dec.		
1,200	Bessemer, Nov.		\$11.50
	Dec.		
1,000	Bessemer, Nov.		\$11.65
	Dec.		
1,000	Bessemer, Nov.		\$11.60
	Dec.		
500	Bessemer, Nov.		\$11.40
	Dec.		
500	Bessemer, Nov.		\$11.50
	Dec.		
1,500	Gray Forge, Nov.		\$10.75
	Dec.		
1,000	Gray Forge, Nov.		\$11.00
	Dec.		
1,000	Gray Forge, Dec.		\$11.00
	Nov.		
750	Gray Forge, Nov.		\$10.60
	Dec.		
500	Gray Forge, Nov.		\$10.65
	Dec.		
500	Gray Forge, Nov.		\$10.50
	Dec.		
500	Gray Forge, Nov.		\$10.50
	Dec.		
300	Gray Forge, Nov.		\$10.50
	Dec.		
300	Gray Forge, Nov.		\$10.50
	Dec.		
300	Gray Forge, Nov.		\$10.75
	Dec.		
600	No. 2 Foundry		\$12.00
	Nov.		
200	Mill Iron		\$11.00
	Nov.		
125	No 2 Foundry		\$12.00
	Nov.		
125	No. 1 Foundry		\$13.00
	Nov.		
100	No. 1 Silvery Extra		\$15.50
	Nov.		
50	No. 2 Silvery		\$13.00
	Nov.		

Blooms, Billets and Slabs.

2,000	Billets and Slabs, Nov., Dec., at mill	\$18.00
1,500	Billets and Slabs, Nov., Dec., at mill	\$17.85
1,500	Billets and Slabs, Nov., Dec., at mill	\$17.50
1,250	Billets and Slabs, Nov., Dec., at mill	\$18.15
1,000	Billets, Nov., Dec., at mill	\$18.10

1,000	Billets, Nov., Dec., at mill	17.80
500	Billets, Nov., at mill	18.25
500	Billets, Nov., Dec., at mill	18.00
300	Billets, Nov., at mill	17.75

Muck Bar.

1,000	Neutral, Nov., Dec.	21.25
700	Neutral, Nov.	21.35
500	Neutral, Nov.	21.30
300	Neutral, Nov.	21.25
200	Neutral, Nov.	21.25

Charcoal.

50	Cold Blast, extra	28.00
50	Cold Blast	24.00
50	Cold Blast	25.50
30	No. 2 Foundry	18.00
25	Warm Blast	17.75

Skelp Iron.

1,200	Tons, Wide Grooved, 1 3/4" 4 m.	
500	Tons Narrow Grooved, 1 3/4" 4 m.	
400	Tons Sheared Iron, 1 3/4" 4 m.	
300	Tons Wide Grooved, 1 3/4" 4 m.	

Steel Skelp.

750	Tons Wide Grooved, 1 3/4" 4 m.	
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Sheet Bars.

500	Tons, Delivered	\$21.50
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Blooms, Billets and Bar Ends.

500	Tons, November	\$12.25
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Spelter.

100	Tons Spelter	\$3.75
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Old Iron and Steel Rails.

500	Tons Iron Rails	\$15.00
400	Tons Steel Rails	\$12.50
400	Tons Steel Rails	\$12.50
200	Tons Iron Rails	\$15.50
200	Tons Iron Rails	\$15.50
100	Tons Iron Rails	\$15.50

METAL MARKET.

NEW YORK, Friday Evening, Nov. 10, 1893.

Prices of Silver per Ounce Troy.

Nov.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	Nov.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
4	1 83 1/2	32 3/4	69 3/4	552	8	1 83 3/4	32 3/4	70 3/4	563
6	1 83 1/2	32 3/4	69 3/4	556	9	1 83 3/4	32 3/4	70 3/4	559
7	1 83 1/2	32 3/4	69 3/4	552	10	1 83 3/4	32 3/4	70 3/4	557

* Holiday.

Silver has now entered upon a new chapter of experience; it seeks a market other than the United States Treasury. Eastern buyers have waited till repeal was an accomplished fact, and during the past few days have bought liberally for China and Japan. Large amounts have been placed to the satisfaction of the parties in interest. The market closes quiet, orders for the present having been supplied.

The United States Assay Office at New York reports the total receipts of silver for the week to be 97,000 ounces.

Gold and Silver Exports and Imports at New York, Week Ending November 4th, 1893, and for Years from January 1st, 1893, 1892.

Week	Gold.		Silver.		Excess of Ex. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1893...	\$6,000	\$277,608	\$333,560	\$2,491	E \$58,761
1892...	70,139,547	58,574,395	26,669,139	3,063,371	E 25,190,919
1892...	59,161,503	7,712,368	18,098,170	2,691,333	E 66,855,972

The gold exported for the week went to London; the silver to the West Indies. The imports, both gold and silver, were from the West Indies. The statement does not include bullion simply in transit. The gold reported in our columns last week as taken in London and Paris for New York account did actually arrive and does not appear in the week's statement, although \$500,000 arrived on Saturday, but too late to be reported.

During the five days ending November 9th the exports and imports have been as follows: Exports, gold, \$68,300; silver, \$224,781. Imports, gold, \$1,487,198; silver, none. Of the silver exported \$49,100 was in Mexican bullion, \$2,650 in South American coin; all the rest was American bullion and coin; of the total \$186,031 went to London, \$25,100 to France and \$13,650 to South America. Of the gold exported \$800 was in English coin, all the rest being American bullion. Of the total gold exported \$1,000 went to London and \$87,300 to South America. Of the gold imported \$1,017,000 was for deposit in the United States Assay office, and was paid for by check upon the Sub-Treasury at New York.

NOTES OF THE WEEK.

As generally expected, Congress did not remain long in session after the repeal of the silver purchase law was completed, but adjourned at the close of last week, taking a recess of a month before the regular session begins in December.

Not much change in business is apparent as yet, the long delay in acting on the silver purchase law having offset much of the benefit anticipated from its repeal. The elections have also been somewhat of a disturbing element. While in New York and elsewhere local and special causes largely determined the result, it is evident that the cry of "hard times" had a very considerable effect on the voters. It is to be feared that the results may be misunderstood by political managers.

Early in the week it was announced that the mints were shortly to be set at work on standard silver dollars, the object being to utilize the seignorage on the silver in the Treasury as fast as possible. Later reports, however, indicate that this is not the programme, though it seems probable that there will be more silver dollars coined than heretofore, as the mints have been at work on gold almost entirely for some time past.

There has been some talk of an issue of bonds to relieve the Treasury, but, while the Secretary undoubtedly has the authority to make such an issue, it is not considered probable that he will use it before Congress meets again.

Secretary Carlisle was in New York during the week and was interviewed by several prominent bankers. It was after his visit to the city that the rumored mint programme for coinage of silver dollars was denied. It is said that the bond question was also discussed, but the Secretary made no announcement of his intentions.

Some additional small purchases of gold in London for New York account are reported, but there are no evidences of any large movement of gold this way at present. It seems to be taken for granted in London, however, that the United States will take some action soon to increase its stock of gold, and there is already talk of measures to prevent the anticipated drain on the gold reserves of the Banks of England and France.

The silver Senators and members of the House have issued an address to the people which contains nothing new, being simply a condensation of the speeches which the country has been listening to with considerable impatience for over two months past.

The United States Treasury statement on Thursday, November 9th, showed total balances in excess of outstanding certificates of \$97,307,063. Of this amount there was in gold \$84,343,921; silver, \$7,099,895; legal tenders, \$3,965,722; treasury notes, etc., \$1,877,525. The total balance showed a slight improvement, there being an increase of \$574,900 during the week. There was a decrease of \$40,941 in gold, of \$66,419 in silver, and of \$39,385 in treasury notes, but an increase of \$1,521,735 in legal tenders.

On the same date the amount of silver dollars and bullion held under the act of 1890 was \$153,278,277, against which there was outstanding in treasury notes \$153,273,280.

The publication of the detailed weekly statement of the New York banks, which was suspended on June 17th last, in accordance with the custom when loan certificates are outstanding, was resumed November 4th, and the exhibit was in one respect a very remarkable showing. The statement showed that the associated banks hold no less than \$52,013,450 in cash over and above the cash reserve of 25% required by law. The total average amount of cash held by the associated banks during the week was \$163,866,600, the average reserve of all the banks being 36.53%. The reserve was increased during the week \$3,225,975. There was an increase of \$552,000 in the specie, and an increase of \$6,211,700 in legal tenders. There was an increase of \$14,150,900 in the deposits and an increase of \$5,058,500 in the loans. Circulation (national bank notes) showed a decrease of \$200,900. The small increase in specie is mainly due to the fact that the Treasury has been paying out very little gold.

The most striking, and perhaps the most encouraging, feature of the statement is the increase of \$5,058,500 in loans. On the other hand the increase in deposits shows a continued stagnation of money, and the large inactive surplus is not a favorable feature.

The Treasury statement of the total amount of money in the country on November 1st, a summary of which was given last week, is in detail as follows:

	In circulation.	In treasury.
Gold coin	\$493,121,679	\$56,616,899
Silver dollars	53,725,818	360,808,732
Subsidiary silver	64,309,807	12,667,195
Gold certificates	78,889,309	115,860
Silver certificates	325,717,232	7,727,275
Treasury notes	150,818,532	1,916,603
U. S. notes	321,892,023	24,788,988
Currency certificates	22,325,000	100,000
National bank notes	197,745,227	11,566,766
Total	\$1,718,544,682	\$486,106,321

The most notable change from the October statement was an increase of \$13,825,870 in gold coin in circulation.

The Bank of England reports a decrease of £49,000 in reserve; the total gold holdings are £25,003,561, an increase of £634,062, as compared with the corresponding week last year. The net exports of gold for the week were £176,000, and the price of bar gold rose slightly, to 78s. The demand for gold for the Continent, nominally for Holland, continues, while Austria is still on the lookout for gold to complete the sum allotted for new coinage. It is expected that the bank will soon put up the discount rate, partly to check the outflow of gold.

The Bank of France reports for the week an increase of 2,890,000 fr. gold, but a decrease of 2,167,000 fr. silver. The specie holdings of the bank are now, in sterling, £68,054,393 gold, and £50,645,804 silver; an increase, as compared with the corresponding week last year, of £1,034,947 gold, but a decrease of £305,805 silver. A further increase in gold and a decrease in silver is expected when Italy begins to buy back her small silver under the new agreement.

Last week's statement of the Imperial Bank of Germany showed an increase of specie of 740,000 marks. The bank's specie holdings, including both gold and silver, are, in sterling, £38,907,600; a decrease of £4,887,400 from the corresponding week in last year.

The Currency Commission appointed by the Government of Ecuador has submitted plans for the gradual withdrawal of silver currency and the substitution of gold, the work to extend over a period of several years.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars.....	\$.56 1/4	\$.58 1/4
Peruvian soles and Chilian pesos.....	.52	.54
Victoria sovereigns.....	4.54	4.58
Twenty francs.....	3.56	3.59
Twenty marks.....	4.74	4.78
Spanish 25 pesetas.....	4.78	4.80

Other Metals.

Copper.—There is a slightly better inquiry for copper for consumption at home, resulting in a stiffening of prices, although not causing the trade to become active. However, holders of copper are confident that manufacturers will soon be compelled to buy, and therefore hold firmly for their own prices which they expect to be paid. Exporters, on the other hand, are not willing to improve their bids, but electrolytic copper in particular has been sold at rather low prices. We are informed that the American production of copper continues to be very large, in spite of the fact that practically the only outlet, at least for the time being, is abroad. Rumors of a combination of foreign bankers and American producers seem to have no substantial basis. Lake is to be quoted at from 9 1/4 @ 10c., electrolytic at from 9 1/4 @ 9 1/2 c., and casting at 9 1/4 @ 1 1/4 c. The foreign market has been firm, and G. M. B's close at £42 10s. for spot and £42 17s. 6d. for three months, with refined and manufactured descriptions ruling as follows: English tough, £ 45 @ £45 5s.; best selected, £45 15s @ £46.; strong sheets, £43 5s. @ £53 15s.; India sheets, £50 10s. @ £57; yellow metal, 4 1/2 d.

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

Copper:		
Havre—La Bretagne.....	Ingots	75 tons
Liverpool—Cific.....	"	108 "
Havre—Maneska.....	"	50 "
Rotterdam—Werkendam.....	Bars	90 "
"	Plates	125 "
"	Cakes	23 "
Loch Lomond.....	Ingots	85 "
Hamburg—Columbia.....	Plates	3 "
Liverpool—Germanic.....	Pigs	20 "
Alaska.....	Ingots	25 "
Hevelius.....	"	100 "
Newcastle—Alsatia.....	Pigs	35 "
Havre—Le Bretagne.....	Cakes	50 "
"	Ingots	90 "
Rotterdam—Amsterdam.....	Bars	50 "
"	Plates	45 "
"	Ingots	43 "
Copper matte:		
Liverpool—Cific.....		53 "
Swansea—Chicago City.....		50 "
Liverpool—Germanic.....		220 "
Bovic.....		18 "
Liverpool—Umbria.....		95 tons

On November 8th the arrival of 1,895 tons copper ore and 100 tons regulus per steamer "Vascongada" from Tilt Cove, Newfoundland, was reported.

The exports of copper from Baltimore for the week ending November 9th were as follows:

Copper:		
Rotterdam—Ohio.....	476 cakes	83,900 lbs.
"	826 bars	112,169 "
"	23 bbls.	23,000 "
"	7,991 ingots	112,498 "

Havre—Probano.....	35 casks	45,842 lbs.
"	99 bbls.	99,000 "
"	985 cakes	173,783 "
"	2,735 bars	257,805 "
"	7,932 ingots	112,492 "
Rotterdam—Urbino.....	478 cakes	160,893 "
"	80 bbls.	80,000 "
"	877 bars	114,706 "
"	2,539 ingots	44,800 "

Exports are also reported of 107 casks (139,900 lbs.) of manganese ore to Glasgow, and of 566 casks (785,044 lbs.) manganese ore to Antwerp.

Tin.—The demand is at last increasing and deliveries during the first week of this month have been decidedly larger than for any similar period within the last three months. This has stiffened prices, and we have to quote spot at 20'50, November at 20'50 and December at 20'60. The foreign market has not only been steady, but has advanced to £76 12s. 6d. for spot and £77 7s. 6d. for three months, these being the closing prices. During this and next month shipments from the Straits are likely to be rather heavy.

Receipts of Banca and Billiton tin in Holland for the 10 months ending October 31st are reported by De Monchy & Havelaar's circular at 6,957 tons, against 8,637 tons for the corresponding period in 1892, a decrease of 1,680 tons, or 19 1/4%. For October the increase of imports was 253 tons.

The returns of the British Board of Trade show for the nine months ending September 30th: Imports of foreign tin, 23,884 tons; exports of English tin, 5,081 tons; exports of tin plates, 301,681 tons. The increase of imports over the corresponding period in 1892 was 2,325 tons, or 10'8%. The amount of foreign tin exported this year was 15,983 tons.

Lead.—The market is being persistently hampered down and the refiners continue to sell freely. On the 6th instant the quotation was reduced to 3'20, the lowest point touched during the panic of last summer, and sales have actually been made at from 3'35 to 3'30, at which figures the market closes, rather flat.

We understand that there has been another shut-down in the Cœur d'Alene district, due to the fact that working is not profitable with ruling values.

The London market is hardening, as we have to quote Spanish lead at £9 16s. 3d. and English at £9 18s. 9d.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: Pig lead presents no novelty. Demand for the metal is light, yet values remain steady and show no decline. 3'17 1/2 c. is the nominal value for both spot and future.

Spelter.—There being a better demand, not only from galvanizers but from the brass makers as well, the market is to be reported firmer at 3'70 New York.

Around the quotations are £17 for good ordinaries and £17 2s. 6d. for specials.

Antimony.—In better demand, and sales of Cookson's have been made at 10c. of L. X. at 9 1/4 c., and of Hallett's at 9 1/4 @ 1 1/4 c.

Aluminum.—The prices, as at present fixed by the manufacturers, are, for 96% pure, 65c. per lb.; 98%, 75c.

Quicksilver.—There is no change to report of this market. It continues quiet with quotations as last reported: New York, \$38; London, £6 7s. 6d.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Nov. 10.

Heavy Chemicals.—A better feeling prevails in the heavy chemical market as the result of the improved general inquiry. While actual business during the past week has not been very great or much heavier than during the preceding week consumers have shown more inclination to come into the market owing to returning business confidence, and this augurs well for the near future. Sales for delivery over 1894 are reported in almost all the chemicals and prices have ruled a shade firmer, especially in the case of alkali. Both Brunner, Mond & Co., and the United Alkali Company have simultaneously advanced the price of this chemical about 10%. We received advices from the other side to the effect that Brunner, Mond & Co. are taking orders for caustic soda for 1894 delivery at a lower price than the Alkali Union. This report makes its appearance periodically and is disbelieved by many.

Quotations are nominally as follows: Caustic soda, 60% 3'05 @ 3'20c.; 70% 2'80 @ 3c.; 74% 2'82 1/2 @ 3'05c.; 76% 3 @ 3'10c. Carbonated soda ash, 48% 1'15 @ 1'25c.; 58% 1'10 @ 1'20c. Alkali, 48% \$1.10 @ \$1.20; 58% \$1.05 @ \$1.15, according to package. Sal soda, English, 1'10c.; American, 1 @ 1'10c. Bleaching powder, 2'25 @ 2'50c.

Acids.—Business in the acid market is beginning to improve. A growing demand for the various acids is reported by manufacturers. If the improvement in November is as marked as it was in October a fair volume of business will be done. September was such a dull month that the trade ought to enjoy some activity now in compensation for it. Prices show little or no change of consequence. In this market we do not hear of much fighting among manufacturers, but "down East" competition is reported as being keen, and some low figures are being named for sulphuric acid: We quote this week: Acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, \$1.87 1/2; in carboys, \$2.25; muriatic, 18", 90c. @ \$1.10; 20", \$1 @ \$1.25;

22", \$1.10 @ \$1.35; nitric, 40", \$4: 42", \$4.50 @ \$4.75; sulphuric, 75c. @ \$1. Mixed acids, according to mixture, oxalic \$6.30 @ \$6.50. Blue vitriol is quoted all the way from \$3.59 to \$3.75; glycerine for nitroglycerine, 11 1/2 @ 12 1/2 c., according to quality and quantity.

Brimstone.—There has been more inquiry for brimstone of late, and prices are slightly higher than last week. Sales have been made at \$19 for best unmixed seconds, on the spot, and \$18 for best unmixed seconds for shipments. Thirds have ruled from 75c. @ \$1 less.

Fertilizing Chemicals.—There has been a good inquiry for fertilizers during the week, and some sales are reported at the prices quoted below. Stocks continue low, and quotations do not show any change of importance from last week. We quote: Sulphate of ammonia, on the spot, gas liquor, \$3.50 @ \$3.55; hone, \$3.25 @ \$3.30. Dried blood, \$2.70 @ \$2.80 per unit for high grade, and \$2.40 @ \$2.50 for low grade. Azotine, \$2.70 @ \$2.75. Concentrated phosphate (30% available phosphoric acid), 75c. per unit. Acid phosphate, 13% to 15%, av. P₂O₅ 60c. per unit at seller's works in bulk. Dissolved bone-black, 17% to 18%, P₂O₅ 90c. per unit. Acidulated fish scrap, \$15 @ \$16, and dried scrap \$25 @ \$25.50 f. o. b. fish factory; wet scrap, \$15 f. o. b. fish factory. Tankage, high grade, \$26 @ \$27; low grade, \$22 @ \$23. Bone tankage, \$23 @ \$24; bone meal, \$24 @ \$25.50.

The price of double manure salts as fixed by the syndicate is as follows: New York and Boston, \$12; Philadelphia, \$11.14; Charleston and Savannah, \$1.17 cwt., basis 48 @ 50%, in 50-to-100 tons on foreign weights and analyses, Sulphate of potash, 90% 96% basis 90%; New York and Boston, \$2.07, Philadelphia, \$2.09 1/2; Charleston and Savannah, \$2.127, sulphate of potash, 96-99% basis 90%, is 4% higher.

Phosphates.—Quotations f. o. b. vessels or cars Charleston are \$4.50 for crude rock, and dried, \$5.25.

Nitrate of Soda.—This market continues quiet, with quotations at \$1.87 1/2 @ \$1.90 for nitrate on the spot.

Liverpool. Oct. 31.

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

There is little change to note in the position of heavy chemicals, for although there are rather more inquiries in the market of late, still the actual amount of business is small.

As regards the coal strike, the outlook is more promising, as it has been agreed that the representatives of both masters and men shall meet in conference, and it is hoped that a satisfactory arrangement will be arrived at to end the disastrous strike.

Soda ash is slow of sale, and for Le Blanc makes quotations are unreliable, varying according to quantity, make, market, etc.; the following is about nominal price: Caustic ash, 48% £4 @ £4 10s. per ton; 57%, 58%, £4 10s. @ £5 per ton. Carbonate ash, 48%, £4 2s. 6d. @ £4 10s. per ton; 58%, £4 12s. 6d. @ £5; all net cash. Ammonia ash, 58%, is less freely offered, but quotations practically remain unchanged at £3 15s. @ £4 per ton, less 2 1/2%. Soda crystals continue in moderate request at £3 5s. @ £3 7s. 6d. per ton, less 5%.

Caustic Soda.—A few resales have been made at from £9 15s. @ £10 per ton for 60% and £10 15s. @ £11 for 70%, but the article is extremely scarce and dear here.

Bleaching powder is still in a state of depression and hardwood casks may be quoted anything from £8 5s. @ £8 15s. per ton, net cash, according to views of holders. Buyers hold aloof, and accordingly orders are very scarce.

Chlorate of Potash.—During the past week there has been a fair inquiry for November-December delivery, but without much actual business to report. For prompt and November delivery 8d. is nearest quotation and 7 1/2 d. for December.

Bicarbonate of soda is in demand and firm at £7 per ton, less 2 1/4% for one cwt. kegs, with usual allowance for larger packages.

Sulphate of ammonia is quiet at about £13 @ £13 5s. per ton, less 2 1/4% for good gray 24 @ 25% in double bags, f. o. b. here.

Nitrate of soda is dull at £9 7s. 6d. @ £9 12s. 6d. per ton, less 2 1/4% for double bags, f. o. b. here, according to quality.

Carb. Ammonia.—Lump 3 1/2 d. per lb.; powdered, 3 1/2 d. per lb., less 2 1/4%.

MINING STOCKS.

[For complete quotations of shares listed in New York Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, St. Louis, London and Paris, see pages 512, 513 and 514.]

NEW YORK, Friday Evening, Nov. 10.

There has been more inquiry for mining stocks during the past week than for many months back. Stocks have been traded in which had not reported a sale for quite a long time. The reason for this semi-activity in the mining stock market may be found in the reports which come from San Francisco. The "boom" is still on there and brokers here are hopeful that it will last long enough to enable them to do a little business. They need it.

The Comstocks have been in better demand and show a fair advance, Consolidated California & Virginia advanced from \$3 to \$5, with total sales during the week of 420 shares. Ophir advanced from \$1.90 to \$2.75; 300 shares of this stock changed hands at these prices. Sierra Nevada opened at \$1.15 and closed at \$2.10, with sales of 900 shares.

Comstock tunnel stock shows the heaviest transaction in point of numbers: 7,500 shares of the common stock were sold at 8c. @ 10c. and \$3,000 of bonds were sold at 10%.

Oriental & Miller, which had not been traded in for some months, this week shows a sale of 400 shares at 4c.

Of the California stocks, Plymouth Consolidated returned to the Exchange this week, and shows transactions of 150 shares at 60c/65c.

Of the Colorado stocks American Flag was dealt in to the extent of 300 shares at 6c. There was not quite so much demand for Lacrosse this week, and sales aggregated only 500 shares at 6c.

Horn Silver was quiet this week, only 100 shares being sold at \$2.70.

Phenix of Arizona shows sales of 1,100 shares at 54c/56c.

NOTES OF THE WEEK.

The Bald Butte Mining Company, of Montana has declared dividend No. 19 of 2% payable November 4th. The amount is \$5,000, making the total amount of dividends paid \$115,000 to date.

Advices from the Comstock state that the Consolidated Virginia shaft has been repaired nearly down to a depth of 900 ft., and that the repairs will be completed down to the 1,000-ft. level by the middle of next week.

During the month of October only 416 tons of Consolidated California & Virginia ore were milled, as ore extraction and other operations, except repair

work, were practically suspended in the lower levels preparatory to inaugurating the upper level campaign. This amount of ore was crushed at the Morgan mill and yielded bullion of the gross assay value of \$13,716, of which \$6,657 was gold and \$6,059 silver.

Boston.

Nov. 9.

(From our Special Correspondent.)

The market for copper stocks ruled extremely dull in the early part of the week with a tendency to lower prices.—Since the holiday there has been more activity and prices have moved upward with more disposition to speculate in this class of securities.

Boston & Montana advanced from \$24 1/4 to \$24 3/4, reacted to \$24, and the buying movement set in advanced to \$25 1/4, with reaction in later sales to \$24 3/4.

The Lake Superior stocks have been very quiet, without much change in prices. Calumet & Hecla sold at \$280 for 11 shares and one share sold at \$282.

A small lot of Tamarack, Jr., sold at \$18 1/2, the last sale being at \$16 1/2 last week.

Wolverine was in fair demand at \$1 1/2, with sales of 500 shares at that price.

Alouez declined 10c. to 25c. for 300 shares, and 200 shares Ridge sold at same price. There were no transactions in Kearsarge during the week.

3 p. m.—Boston & Montana declined this afternoon to \$24 1/4, and Butte & Boston to \$8. Others unchanged.

San Francisco.

SAN FRANCISCO, Nov. 10 (By Telegraph).—The opening quotations to-day are as follows: Best & Belcher, \$2.85; Bodie Consolidated, 40c.; Belle Isle,

15c.; Bulwer, 10c.; Chollar, 95c.; Consolidated California & Virginia, \$4.80; Gould & Curry, \$2.45; Hale & Norcross, \$1.15; Mexican, \$1.40; Mono, 25c.; North Belle Isle, 10c.; Navajo, 10c.; Ophir, \$2.45; Savage, \$1.15; Sierra Nevada, \$1.90; Union Consolidated, \$1.40; Yellow Jacket, \$1.45.

London.

Oct. 31.

(From our Special Correspondent.)

There has been an almost total stoppage of business during the past week in the stock markets here. Last week's settlement was almost an empty form, as there were hardly any accounts to settle or carry over.

American mining stocks have been almost untouched during the past week and no noticeable movements have taken place. Alaska-Treadwells have continued the upward movement already reported as having taken place during the past month and are 8s. higher to-day than a week ago.

The fourth annual meeting of the Mount McClellan Mining Company, Colorado, was held last week to hear the report for the twelve months ending December 31st, 1892. During that year the quantity of ore sold was 1,620 net tons averaging 26.77 oz. of silver, 0.065 oz. gold and 56.35% lead, and bringing \$77,001.

CURRENT PRICES.

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

Table listing various commodities and their prices, including Acetic acid, Ammonia, Alum, Antimony, Argon, Arsenic, Asbestos, Ashes, Asphaltum, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Copper, Epsom salt, Feldspar, Fluorspar, French chalk, Fuller's earth, Glauber's salt, Glass, Gold, Kaolin, Lead, Lead-Red, Litharge, Magnesite, Marble dust, Metallic paint, Mica, Mineral wool, Naphtha, Nitric acid, Ochre, Oils, Potassium, Potassium cyanide, Pyrites, Quartz, Rubber, Sal ammoniac, Salt, Salt peter, Soapstone, Soda, Sulphur, Sulphuric acid, Talc, Terra alba, Tin, Vermilion, Zinc, and Zinc white.

Table listing various commodities and their prices, including Cadmium iodide, Chalk, China clay, Chlorine water, Chrome yellow, Chromic iron ore, Chromalum, Cobalt, Copper, Vitriol, Nitrate, Copperas, Best, Liverpool, Chromium, Fluorspar, French chalk, Fuller's earth, Glauber's salt, Glass, Gold, Kaolin, Lead, Lead-Red, Litharge, Magnesite, Marble dust, Metallic paint, Mica, Mineral wool, Naphtha, Nitric acid, Ochre, Oils, Potassium, Potassium cyanide, Pyrites, Quartz, Rubber, Sal ammoniac, Salt, Salt peter, Soapstone, Soda, Sulphur, Sulphuric acid, Talc, Terra alba, Tin, Vermilion, Zinc, and Zinc white.

Table listing various commodities and their prices, including Mineral wool, Naphtha, Nitric acid, Ochre, Oils, Potassium, Potassium cyanide, Pyrites, Quartz, Rubber, Sal ammoniac, Salt, Salt peter, Soapstone, Soda, Sulphur, Sulphuric acid, Talc, Terra alba, Tin, Vermilion, Zinc, and Zinc white.

Table listing various commodities and their prices, including Tin, Muriate, Double or strong, Oxymur, Vermilion, Am. quicksilver, Chinese, Trieste, American, Zinc white, Antwerp, Paris, Red Seal, Muriate solution, Sulphate crystals, THE RAREER METALS, Arsenic, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium-Yttrium, Gallium, Germanium, Glucinum, Iridium, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Niobium, Osmium, Palladium, Potassium, Rhodium, Ruthenium, Selenium, Sodium, Strontium, Tantalum, Tellurium, Thallium, Titanium, Tungsten, Uranium, Vanadium.

NEW YORK MINING STOCK QUOTATIONS.

Table with columns for Name and Location of Company, Dividend-Paying Mines (Nov. 4-10), Non-Dividend-Paying Mines (Nov. 4-10), and Sales. Includes companies like Adams, Alice, Amador, and Alpha.

*Ex-dividend. †Dealt in at New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 5,770. Non-dividend shares sold, 14,475. Total shares sold, 20,245.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, Dividend-Paying Mines (Nov. 3-9), Non-Dividend-Paying Mines (Nov. 3-9), and Sales. Includes companies like Atlantic, Bate, Bonanza, and Allouez.

Dividend shares sold, 2,586. Non-dividend shares sold, 2,162. Total shares sold, 4,748.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Large table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and amount of last. Lists 54 companies with detailed financial data.

DIVIDEND-PAYING MINES.

NON DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares, Par, Assessments, Dividends, Date and amount of last, Total paid, Date & amount of last, Name and Location of Company, Capital Stock, Shares, Par, Assessments, Date and am't of last.

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ¶ Previous to the consolidation of the California had paid \$1,320,000 in dividends, and the Cons. Virginia \$2,980,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$150,000 before the reorganization in 1880. ††† This company acquired the property of the Raymond & Ely Company which had paid \$3,075,000 in dividends. †††† Previous to this company's acquiring Northern Bell, that mine paid \$2,400,000 in dividends against \$425,000 in assessments.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Stock Names, Dates (Nov. 4-10), and Sales. Lists various coal and railroad stocks with their respective prices and sales figures.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Stock Names, Dates (Nov. 4-10), and Sales. Lists industrial and trust stocks with their respective prices and sales figures.

CALIFORNIA. San Francisco.

Table with columns for Stock Names, Dates (Nov. 3-9), and Closing Quotations. Lists California stocks from San Francisco.

COLORADO. Colorado Springs.

Table with columns for Stock Names, Dates (Nov. 4), Bid, and Asked prices. Lists Colorado stocks from Colorado Springs.

Denver.

Table with columns for Stock Names, High, Low, and Sales. Lists Colorado stocks from Denver.

COLORADO. Aspen.

Table with columns for Stock Names, Dates (Oct. 28), and Prices. Lists Colorado stocks from Aspen.

MARYLAND. Baltimore.

Table with columns for Company, Bid, and Asked prices. Lists Maryland stocks from Baltimore.

MINNESOTA. Duluth.

Table with columns for Company, Bid, and Asked prices. Lists Minnesota stocks from Duluth.

UNLISTED STOCKS.

Table with columns for Company, Bid, and Asked prices. Lists unlisted stocks from various locations.

MONTANA. Helena.

Table with columns for Company, Bid, and Asked prices. Lists Montana stocks from Helena.

MISSOURI. St. Louis.

Table with columns for Company, Bid, and Asked prices. Lists Missouri stocks from St. Louis.

PENNSYLVANIA. Philadelphia.

Table with columns for Company, Bid, and Asked prices. Lists Pennsylvania stocks from Philadelphia.

Pittsburg.

Table with columns for Company, Bid, and Asked prices. Lists Pennsylvania stocks from Pittsburg.

London Quotations.

Table with columns for Buyer, Seller, and Prices. Lists London quotations for various commodities.

Paris. Oct. 27.

Table with columns for Buyer, Seller, and Prices. Lists Paris quotations for various commodities.

New York Mining Stocks.

Table with columns for Company, Bid, and Asked prices. Lists New York mining stocks.

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RESERVOIR.—Department of Water, Altoona, Pa.—The injunction restraining the Board of Water Commissioners from receiving bids for the building of an impounding reservoir, having been, by the decree of Court, dissolved, therefore, in accordance with a resolution of City Council, approved the 4th day of November, 1893, the Board of Water Commissioners will receive bids for the building of a new impounding reservoir, as per advertisement of September 4th, 5th and 6th, 1893, until 12 o'clock M. of Saturday, the 18th day of November, 1893. T. H. WIGGINS, Chairman; JAMES TURNER, W. J. HEINSLING; C. A. MARTIN, Secretary.

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BRIDGE.—BUDAPEST, AUSTRO-HUNGARY—A bridge of a total length of 312 meters and another of 332 meters will be executed on the Danube at Budapest. An international competition for plans and projects is opened for these two bridges. Without regarding to which bridge it refers a prize of \$6,080 will be awarded to the best project, and a prize of \$4,070 to the second best project. If the best project solved the question of connecting the two banks at the Eskuter with one opening, so that it answers the stipulations contained in the conditions, this project will receive a special premium of \$2,030, besides the allotted first prize. The Hungarian minister of commerce reserves the right of buying any of the not rewarded projects for \$1,015. If one of the winners should be commissioned to execute the work upon the basis of his tender the prize allotted will not be paid. The projects provided with device and sealed letter containing the device are to be presented to the manager of the bureaux of the Hungarian royal ministry of commerce (Budapest, Lenczhi, ulca) latest the 31 January, 1894, toward receipt of the terms to which the surroundings of the bridges and the plans and longitudinal section of every bridge are subjoined can be obtained at every consulate-general of Austria-Hungary.

MEMPHIS, TENN.—Bids will be received at the U. S. Engineer Office until December 5 for about 335,000 cu. yds. work in the lower Yazoo districts. CAPT. C. McD. TOWNSEND, U. S. A.

CHEMICAL ENGINE—Easton, Pa.—Bids are asked until November 20th for a chemical fire engine with double tank, capacity 35 galls. each. L. M. FINE, City Clk.

SEWER.—Sealed bids or proposals will be received by the Common Council of the City of Olean, N. Y., until the 21st day of November, 1893 (at which time the bids will be publicly opened and read), for the construction of the following, the Common Council reserving the right to reject any or all bids: 6,250 ft. 20-in. vitrified pipe sewer; 1,650 ft. 15-in. vitrified pipe sewer; 550 ft. 12-in. vitrified pipe sewer; 3,630 ft. 10-in. vitrified pipe sewer; 650 ft. 8-in. vitrified pipe sewer; 450 ft. 6-in. vitrified pipe sewer and appurtenances. Specifications may be procured, plans explained, and any further information desired at the office of the City Engineer. W. V. SMITH, City Clerk; C. S. GILES, City Engineer.

GRADUATION.—Sonora & Sinaloa Irrigation Company, 58 William street, New York.—Proposals will be received at this office until December 20th, 1893, for the graduation of 20 miles, more or less, of the Yaqui Canal, on the south side of the Yaqui River, in Sonora, Mexico. Form of contract and specifications and full information concerning the nature of the work can be obtained at this office. Due notice will be given to bidders of time and place of opening proposals and awarding contract. E. S. NETTLETON, Chief Engineer.

LEVEE WORK.—U. S. ENGINEER OFFICE, 106 Madison street, Memphis, Tenn.—Sealed proposals in triplicate will be received at this office until December 5th, 1893, for the enlargement and construction of levees in the lower Yazoo district, containing about 335,000 cubic yards; the work to be completed by June 30th, 1895. Specifications, blank forms and all available information will be furnished on application to this office. C. McD. TOWNSEND, Captain of Engineers U. S. Army.

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