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THE Biwabik Iron Ore Company, of the Mesaba Range in Minnesota, is asking for bids for the removal of a very large amount of stripping. It is said several hundred thousand cubic yards of earth and rock will be removed to permit of working the ore body "open-cast." No doubt this is true economy and will enable this company to put ore in the market at a price which will enable the furnaces to meet even present prices of pig iron and make money.

THE first practical experiment in the use of electricity for propelling boats on the New York canals will be made next week on the Erie Canal level east of Rochester. The Westinghouse Electric Company has supplied the plant, and the special devices in use for taking the power from the conducting wires and transferring it to the motors of the boat are the invention of its engineers. The Governor and a number of State officials will be present at the trial.

THE great strike of the coal miners in England has reached a point in its disastrous results on business where the government felt some intervention necessary. At the suggestion of Mr. GLADSTONE, the Prime Minister, both the Coal Owners' Association and the Miners' Federation sent delegates to a conference which began on Thursday of this week, and at which the presiding officer was Lord ROSEBURY. The result, according to late dispatches, is to be a resumption of work November 20th, old rates of wages to be continued until February, when a board of arbitration will be appointed.

THE German iron trade just now is not in much better condition than our own. Complaint is made that the demand for iron has declined steadily throughout the year, so that prices both of pig and finished iron have fallen to a very low point, and it is difficult for makers to sell at a rate which will cover cost of production. The great Bochum Company has had to reduce its half-yearly dividend—although it still pays 3 1/2 per cent.—and smaller concerns are in a much worse condition. The Silesian ironmakers have asked for a reduction in railroad freight rates, and the Westphalian manufacturers will follow their example, but do not expect much relief.

THE protection given the Hungarian coal operators does not seem to have worked for the benefit of consumers in that country, since complaint is made that the best coal is exported, and is moreover sold to foreign customers at a lower price than is charged for inferior coal consumed at home. The Hungarian coal is not of very good quality, and it is only the best which can compete with foreign coal in the general market. The government is urged to permit the importation of coal from Germany and to decrease the railroad rates, in order to break down the present combination and give consumers reasonable prices, all of which has a somewhat familiar sound to us here.

THE negotiations for a union of the Russian petroleum producers are still in progress, and it is stated that the prospect is that firms controlling some 90 per cent. of the output will join in the agreement. In this case the small firms, representing the remaining 10 per cent., can easily be brought in. In 1892 about 77 per cent. of the total Russian production was controlled by 17 firms or companies, who are all represented in the present conference at St. Petersburg. In the six years 1888-1892 the Russian output of petroleum showed an increase of 56 per cent., while the exports increased in much greater proportion. As soon as the union is organized it is proposed to open negotiations with the Standard Oil Company for a division of foreign trade.

IN another column a correspondent gives expression to what is doubtless the feeling of a large number of miners in these times of decreasing wages. The miners, he says, will not so much object to a reduction of their own pay, provided the cutting is impartial and begins at the head. This feeling is perfectly natural and is founded in justice, and it may be considered entirely apart from the ordinary and unreasoning jealousy which most men have of those who earn more than themselves. While it is right that ability should be recognized in paying wages, it is also right that in times when retrenchment is necessary it should be applied to all impartially, and that the superintendent and manager should be called to contribute their share as well as the miner or the unskilled laborer. Reductions which take effect on the latter only are neither just nor wise, and are sure to provoke resistance, when a fairer policy would command respect and acquiescence.

THE description of the German mining exhibit at Chicago, which is given on another page, indicates to some degree the extent and thoroughness of preparation which marked throughout the representation of German industries, by far the finest and most complete made by any foreign nation. This was in thorough accordance with the plans for extension of German trade to which we referred in our issue of November 4th. The first step was to take every opportunity of advertising German manufactures; to show all who might be expected to visit Chicago what Germany could do, what her people had to offer for sale and the ex-

cellence of her products. For this purpose the exhibit was well adapted; and when followed up by other measures for securing trade, the money spent at Chicago will doubtless prove in the end a good investment.

Our manufacturers would do well to study and profit by this lesson. The excellent displays which many of them made at the Columbian Exposition were good preliminary advertisements, but they were not enough. They should be followed up by missionary work, not done in a desultory, haphazard way, but thorough and systematic, carefully planned, and then persistently worked out.

THE market for steel rails has very promptly justified the figures of cost of production which we gave a few weeks ago, and which were not given inconsiderately. From \$29 a ton they dropped to \$24, and this week we record \$22 delivered in Boston and but little over \$21 at some of our mills. These are much the lowest prices ever recorded in this country, and it cannot be supposed that they leave any fair margin of profit, except at one or two of our largest mills, over the present unexampled low cost of production.

Each succeeding period of depression marks a new and lower record in prices and in cost of production; indeed if the rivalry which has broken out among the members of the late combination should continue, the market price would fall to actual cost of production without profit or even the necessary margin for maintaining plant in thorough efficiency. The other and less perfect works are being "frozen out" by such prices, and the business is being concentrated in the hands of a few great concerns which can do what they will with the market so long as they can agree among themselves, and on which there can be no check except through the competition of foreign works.

THE new United States cruiser "Columbia" on her preliminary trial trip made the highest speed on record at sea. In a run of 15 miles she attained the extraordinary speed of 22.87 knots an hour, but this was not a maximum, for under forced draught she ran a distance of about 7.74 knots at the very high speed of 24.29 knots an hour, and on a second trial over the same distance the rate was 24.95 knots, or nearly 29 miles an hour. The average of the two runs gives the ship a record of making 15.5 knots at the rate of 24.62 knots an hour. The highest previous speed for a large vessel was made by the Cunard steamer "Campania" and was 23.32 knots in a one-hour run. The Argentine cruiser "Nueve de Julio" has a record of 23 knots for a short distance on her trial trip, so that the "Columbia" has beaten the record for anything approaching her size, although some small torpedo boats have made greater speed on short runs.

The "Columbia's" three engines worked up to a total of about 22,000 H. P. The peculiar design of the ship, with her triple screws, which has been much criticised, made the trial of unusual interest to naval constructors. The official trial trip has not yet taken place, having been postponed on the 16th on account of unfavorable weather.

A LAW of considerable importance to miners and prospectors was passed at the recent extra session of Congress and, having been approved by the President, is now in force. This law suspends for the present year Section 3324 of the Revised Statutes, requiring work to the amount of at least \$100 yearly to be done upon mining claims in order to hold possession of them. No mining claim will be liable to forfeiture for failure to do the yearly assessment work this year—except in the State of South Dakota—provided the claimant shall file before December 31st, in the land office where the original location was filed, notice that he intends, in good faith, to hold and work the claim.

This bill, which was introduced by Mr. BELL, of Colorado, was generally advocated by the representatives of the mining States on the ground that many miners would be this year, in consequence of the depressed condition of the silver mining industry, unable to put in the assessment work, and would therefore be compelled to lose claims which they had discovered, which would be an addition to the hardship of their present condition. These representations were generally accepted, and the bill met with no opposition. South Dakota was exempted from its action on the statement of its Senators that the mining claims in that State were very generally the property of non-residents who were able to meet the requirements of the statute.

COLORADO ENTERPRISE.

When in the last days of June the silver market collapsed, Colorado seemed on the verge of utter ruin. The business of silver mining received the shock first, but its effects extended to the other diversified industries of the State. It is pleasing, therefore, to chronicle a recovery which promises to be all the more permanent for its slowness. Silver mining has been recommenced at Leadville, Crede and other districts, but only in a half-hearted way. Vigorous development of the mines and extensive shipments of ore are in most cases postponed until the effect of the repeal of the Silver Purchase law can be measured.

The cessation of so much silver mining has let loose a flood of activity upon the principal goldfields. Of these the Cripple Creek district is receiving much attention, if not from the capitalists, who are still awaiting the clearing of the financial atmosphere, at least from the newspapers. The most sanguine hopes of the development of a very extensive gold mining region are entertained; indeed, the expectation has been expressed by some that the young camp will be to Denver in the near future what Leadville was to it in the past. Cripple Creek is at present yielding only from \$150,000 to \$200,000 per month, but this does not represent the capabilities of a camp which has 80 producing mines. The ore is for the most part low grade though plentiful, and offers a good field for the exercise of the most economical and skillful metallurgical science. At present the battle of the processes is being waged, and stamp milling, cyanide treatment and chlorination are in turn approved.

Similarly, at Yankee Hill, a new district, which is a sort of offshoot from old Gilpin County, there is much talk of the best method of ore reduction. The mine-owners of both districts will do well to remember that skilled metallurgical knowledge is necessary though expensive, and that cheap advice is dangerous and the most costly of all.

At the oldest of Colorado's mining towns, Blackhawk, the mills are well supplied with ore. There is some probability of the erection before very long of a new large gold stamp mill, and there is reason to hope that when such a decision is arrived at the plant will be up to date and supplied with all the improvements whose absence marks the ordinary Gilpin County mill.

A more cheerful tone prevails in Denver, with the belief that Colorado will soon be herself again. Though the business of mining has not yet recovered the tone of six months ago, there are signs of daily improvement. One thing the depression has done which is of unqualified good. It is teaching thrift, not only in the household, but also at the mine and in the mill. The Western mind does not retain impressions long, yet it may be hoped that the present period will inaugurate an era of greater economy, but no less enterprise, in the carrying out of mining operations.

THE DAUPHIN ISLAND SCHEME.

The repeal of the Silver Purchase Act has produced a much better feeling in foreign financial circles toward American investments, and already we hear of several important matters being taking up which were held in abeyance while the impression prevailed that this country might drift on to the silver standard.

Unfortunately the first wave of the returning tide of confidence carries on its crest some very questionable enterprises. The *Financial News*, of London, reports that arrangements have been made with the Commercial Bank of Scotland to place £80,000 of the debentures of the Dauphin Island (Ala.) Railroad and Harbor Company.

This negotiation, we hear has been brought about by Lord THURLOW, whose name has become very familiar in connection with the Harney Peak Tin Mine bubble. It is said that Lord THURLOW, as well as a great many other English capitalists, lost heavily in this tin mine enterprise losses which they would have avoided had they heeded the frequent and earnest warnings of the ENGINEERING AND MINING JOURNAL. Everyone now knows, what we said from the very beginning, that the Harney Peak mines are practically worthless—and most men also know that the losses they have occasioned foreign investors have prevented the investment here of immense sums in legitimate enterprises which would have made fair returns on the money. Every unprofitable and, much more so, every dishonest enterprise is a standing warning against the investment of capital here, and it is therefore to the interest of every legitimate industry to have light thrown on such doubtful investments before they have succeeded in gathering in the money of the unwary.

The Dauphin Island scheme is, in the opinion of competent engineers who have examined into it, one of the worst class. The Dauphin Island Improvement Company, which seems to be the same thing as The Dauphin Island Railway and Harbor Company, owns, according to the surveyor's map, 680 acres, or a little more than one-fourth of Dauphin Island, Ala., and that portion of it, a mere sand bar, was completely inundated in the recent storm; reports stating that it was covered by 7 to 8 ft. of water, and that everything movable was washed off it. To get to this delectable site for an industrial city the company has to build 10.7 miles of trestle, on piles, across Grant's Pass, a portion of which will be in quicksands; and to get away from it would have to build a harbor out in the open Gulf of Mexico from this sandbar.

The whole scheme from an engineering standpoint is wild in the extreme and impracticable in a business sense, and all the money invested in it has even a worse foundation than in the Harney Peak Tin mines. The inevitable loss of all this capital will necessarily injure legitimate enterprises, and we trust our English contemporaries will urge upon those interested in the Dauphin Island enterprise to have it carefully investigated by competent and *disinterested* experts who are familiar with the Gulf Coast and the engineering as well as the business elements of the problem, before they part with their money.

NEW PUBLICATIONS.

THE GOLDEN TRANSVAAL. By Henry Longland. London, England; Simpkin, Marshall, Hamilton, Kent & Co. Pages 60; illustrated.

This book is a popular description of the gold mines of the Transvaal, and the city of Johannesburg. It contains an interesting, though brief, historical account of the discovery of the now famous banket reefs, and their early development, the birth and growth of the city, and some of the people who live there. The book has a picture on every page; some of them are good, and others are poor, but they give one a clearer idea of the life and conditions in the Witwatersrand district than would be obtained from many more pages of letter-press.

JAHRBUCH DER CHEMIE. Vol. II. 1892. Braunschweig, Germany; Friedrich Vieweg & Sohn. Pages 584.

This is the second volume of a new year-book which aims to record the progress in pure and applied chemistry each year in the same manner as is done in the numerous mineralogical, mechanical, and other year-books, brought out in Germany. The editor is aided in the preparation of the volume by a staff of 11 assistants, most of whom are professors at one or another of the universities or technical schools of Germany and Austria, the list including Professors Durre, of Aachen, Haussermann, of Stuttgart, Bischoff, of Riga, and other well known names. The scope of the volume is comprehensive, the subjects treated including physical, inorganic, organic, physiological, and pharmaceutical chemistry, the chemistry of foods and agriculture, metallurgy, fuels, explosives, the technology of the hydro-carbons and oils, tars and the anilines, dye-stuffs, and photography. The book is well printed and well bound. The series will be a necessary addition to the library of every chemist.

TABLES FOR THE DETERMINATION OF THE ROCK-FORMING MINERALS Compiled by F. Loewinson-Lessing, Professor of Geology at the University of Dorpat; translated from the Russian by J. W. Gregory, F. G. S. with a chapter on the Petrological Microscope, by Prof. Grenville A. J. Cole, F. G. S. London & New York; Macmillan & Co.

These tables have been prepared to supply the want of a plan for the rapid determination of the mineral constituents of rocks on the same system as that employed in mineralogy and botany, where one character after another is investigated, and the identity of the specimen is finally established by elimination. The former tables used for this purpose, like those of Hussak and Michel Levy, are catalogues and not properly determinative schemes. Professor Loewinson-Lessing's book is intended to serve as a companion to these.

These new tables deal solely with the characters of rock-forming minerals as seen in thin sections, under the microscope. The plan is very simple. The minerals are primarily divided into three classes, the isotropic, uniaxial, and biaxial. Having determined to which a mineral belongs, its color in ordinary light is then noted, minerals of each color being further subdivided into those which are pleochroic and those which are not. Colorless minerals are tested at once by polarized light, and are then subdivided according as they exhibit bright or dull polarization colors. It is necessary to verify the conclusion arrived at from the table by reference to the catalogues of Hussak, Rosenbusch, Lacroix, or Michel Levy, which give a full list of all the characters recognizable in a thin microscopic section. The English translation of Professor Loewinson-Lessing's book has been well arranged, and it will doubtless be a valuable aid to petrographers.

BRADLEY'S ATLAS OF THE WORLD FOR COMMERCIAL AND LIBRARY REFERENCE. Philadelphia; Wm. M. Bradley & Co. Containing 176 maps. Price \$27.

To review a work like this is no easy task, and perhaps can only be properly done after long use has made one familiar with its perfections and imperfections. To begin with the former, it may be said that the maps are generally of large size, a great advantage for reference, and are arranged carefully in a logical order which is not the case with all atlases. The plates are generally good and the engraving fair, although on some of the Western States, such as Idaho, Montana, Washington and Oregon, the mountain shading is entirely too heavy, making the map very difficult to read and the smaller places almost impossible to find. The maps are of varying excellence as far as the mechanical execution is concerned, as will be readily seen by anyone who will compare that of California on page 55, for instance, with that of Pennsylvania, on page 42, or of Massachusetts, on page 38. The maps of European and Asiatic countries are on larger scale, and in greater detail than we are accustomed to find in an American atlas, and some pains seem to have been taken to bring them up to date. The map of Mexico seems to be an excellent one, and is one of the features which we find worthy of praise. On the other hand, there are several defects which we are obliged to note. The map professes to have been brought up to date, but it is manifest that this is not always the case. The railroad map of the United States which precedes the various State maps shows, for instance, no line between the Northern Pacific and the Canadian Pacific, altogether omitting the Great Northern extension through Dakota and Montana. The Rock Island's southwestern extension is ignored entirely, and the extensive system which has been built up in central and southern Florida is omitted. In fact, the whole southern railroad section of the country is notably imperfect. To show further the absence of care in bringing the several State maps up to date we may mention that the map of Maine shows nothing of the important line from Bangor northward into the Aroostook country. On the map of New York the Poughkeepsie Bridge ends in the air, and the railroad line extending westward from the bridge is not shown, in spite of the fact that it has been in operation for several years. The same may be said of the line east of the bridge. Some of the newer lines and extensions in the coal country of Pennsylvania are also omitted. To take another instance, the iron towns on the Gogebic Iron Range, in Wisconsin, and the upper peninsula of Michigan, are conspicuous by their absence from the map, and in

Minnesota the Vermilion and Mesaba Iron Ranges find no place. The omission of the Mesaba might be excusable, but the Vermilion Range is old enough to find a local habitation and a name upon a map. Apparently more has been done to bring up the Western States to date than those on the Central and Atlantic coast, but there are omissions which are hardly creditable to a map bearing the date 1893. The railroads of Washington are notably imperfect. The map of the Indian Territory appears not to have been revised for several years; the boundaries of the territory of Oklahoma are not properly indicated, nor are those of the Cherokee strip, to which so much attention has been called recently, shown at all. The towns and cities of Oklahoma are not given, and according to the map the only railroad line through the territory, from north to south, is the old Missouri, Kansas & Texas line; the other railroads which have been built through the territory being omitted altogether.

It is, however, a thankless task to find fault, and we do not desire to carry this further than is absolutely necessary. It would certainly seem, however, that when we are promised a map brought up to the latest date, the promise should be fulfilled. We have spoken of the fullness of the foreign maps as an excellent feature, and indeed they are very good, but here also there are some things to be noted which need an amendment. The railroad system of the German Empire is quite imperfectly shown, and the Swedish system is not brought up to date. On the map of Russia its possessions in Turkestan are not shown with distinctness, nor do we find the Trans-Caspian railroad laid down, although it has now been in operation for at least six years. The railroads which have been built during recent years in southeastern and eastern Russia have also been omitted, with one or two exceptions, and it would be difficult to follow on the map any modern book of travels. It is very much to be regretted that with so many excellent points this fine atlas should be marked by such defects, when a little additional care would have made it a most valuable addition to any library or reference table.

BOOKS RECEIVED.

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

- The World's Congress of Bankers and Financiers; Addresses and Papers.* Chicago, Ill.; Rand, McNally & Co. Pages 616.
- Electro-Chemical Analysis.* By Prof. Edgar F. Smith. Philadelphia; P. Blakiston, Son & Co. Pages 116; illustrated. Price \$1.
- Metallurgia de la Plata en Bolivia y en el Peru.* By M. Alexis Drouin. Madrid, Spain; Enrique Teodoro. Pamphlet; pages 24.
- Beitrag zur Erklärung der Erdbeben und der Schlagenden Wetter.* By E. Huguenel. Potsdam, Germany; R. Hachfeld. Pamphlet; pages 56.
- Personal Recollections of Dr. Werner von Siemens.* Translated by W. G. Coupland. New York; D. Appleton & Co. Pages 416; with portrait.
- Ontario. Second Report of the Bureau of Mines, 1892.* Archibald Blue, Director of the Bureau. Toronto, Ont.; Printed for the Bureau. Pages 264.
- Standard Tables for Electric Wiremen.* By Charles M. Davis; fourth edition, revised by W. D. Weaver. New York; The W. J. Johnston Co., Ltd. Pages 128; illustrated. Price \$1.
- Geological Survey of New Jersey. Annual Report of the State Geologist for the year 1892.* Prof. John C. Smock, State Geologist. Trenton, N. J.; State Printers. Pages 368; illustrated.
- Catalogue of the Russian Section at the World's Columbian Exposition in Chicago.* St. Petersburg, Russia; Published by the Imperial Russian Commission, Ministry of Finance. Pages 572.
- United States Navy Department. Annual Report of the Bureau of Steam Engineering, 1893.* Com. Geo. W. Melville, Chief of Bureau. Washington; Government Printing Office. Pamphlet; pages 32.
- Geological Survey of Georgia. The Paleozoic Group; the Geology of Ten Counties of Northwestern Georgia.* By Dr. J. W. Spencer, State Geologist. Atlanta, Ga.; State Printer. Pages 408; illustrated.
- An Elementary Treatise on Theoretical Mechanics. Part II. Introduction to Dynamics; Statics.* By Prof. Alexander Ziwet. New York and London; Macmillan & Co. Pages 184, with diagrams. Price \$2.25.
- Annuaire des Mines, de la Metallurgie, de la Construction Mecanique et de l'Electricite; 1893.* Edited by Jules Gouge. Being the yearly edition of the "Journal des Mines." Paris, France; E. Bernard & Co. Pages 1,104.

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.

Standard Methods of Analysis.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I have noticed in the column of your most valuable "Journal" that a movement is on foot to standardize methods of analysis in use by metallurgical chemists. As the "Journal" office is usually the starting place of such good things, I address this to you to request that my name be identified with such a movement. I shall be pleased to learn through your columns what steps have been taken in this direction, and also from time to time the extent of the movement and the parties who join in it. HENRY M. STANLEY.

SAN ANTONIO DE LA HUERTA, SONORA, Oct. 27.

Coke Sweating.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Will you kindly permit me to say a few words in explanation of the phenomenon of "coke sweating" spoken of by Mr. Page, in the *Journal*, of November 11th? To make you and Mr. Page sure that

I have a right to speak anent the subject, I will say that I was an actual and practical coke drawer for 21 months, and that my labor in that capacity can be verified by reference to a certain pay roll of not very many years ago. The matter is very simple indeed. If Mr. Page had consulted one of his old hands, he would have learned that some hot coke had been loaded—and this is not an uncommon thing at places where the attempt is made to quench the coke by a minimum of water—and that then a hose had been turned on, to make all safe; that the doors of such a car would be shut, needs no words. All the rest of Mr. Page's observations agree very closely with the case, without calling chemistry or other occult things into requisition.

Not very long ago I was called upon to examine a coke plant as to its value; I found that the loading of hot coke had the result stated above; it became a question of business whether its customers accepted coke so watered after loading; it was usually accepted with some grumbling, though the lower strata contained, as Mr. Page says, 5% and more water.

F. K., An Old Coker.

Reductions in Mining Wages.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I wish to write a few words on the subject of wages. Neither the intelligent part of the miners nor the miners' union would be opposed to a reduction in wages during the present business depression, if only even measure should be dealt out. For instance, a superintendent and manager of one concern gets \$10,000 per annum, practically of late for doing nothing except occasionally asking his able and efficient foremen at the different mines whether everything was "O. K."

Now I do not ask to have this important office abolished, but we miners wish that the reduction should commence with the heads and not with the poor workmen.

If it was a private concern, I suppose it could be claimed that it was nobody's business, but here the stockholders and the public should know it, as the stock of the company I refer to is quoted in Boston and large transactions take place daily. If the "Engineering and Mining Journal" should advocate similar reductions all over, we miners will not kick. We expect the paper, which is known to be the just and honest expression of the mining interest, to fight the red tape of the officers, and have them take their own medicine first, or at least in equal measure.

M.

BUTTE, MON., Nov. 12, 1893.

Wyoming.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Wyoming, although young, is the mother of millions. She invites both home and foreign capital with some 64,000,000 acres of area; with \$50,000,000 worth of live stock grazing on the succulent grasses of her uplands; with 15,000,000 acres of the best arable land, of which there are "under ditch" about 2,000,000 acres. She has 10,000,000 acres of forest, covering her mountain crests and conserving their water supplies, extending often down to the banks of the stream. Coal is distributed through nearly every county of the State, and is already mined to the extent of \$4,750,000 a year, and marketed (so excellent is its quality) in Colorado, even in Omaha. Her reserves of petroleum, are possibly co-extensive with her coal, as shown by many wells, that have already tapped the oil. Again, Wyoming has deposits of iron ore, some of it showing as high in metallic iron as 68.10%, and as low in phosphorus as 0.058%, making it fit for conversion into Bessemer steel. Even in advance of transportation facilities, Wyoming has enlisted Eastern manufacturers in the development of her deposits of soda. The value of her mountain quartz veins and valley placers, engineers and geologists, assisted by scores of prospectors from the shut-down silver mines, are now actively engaged in trying to find out. From all quarters of the State reports of new discoveries are coming in. Hitherto, Wyoming has hardly been mentioned as a producer of the precious metals, yet, geologically, she seems to be a promising gold ground. During a recent professional trip diagonally across the State from Cheyenne, in the southeast, to the Yellowstone Park uplift, in its northwest corner, the writer saw many repetitions of the characteristics of a gold-bearing region besides the practical testimony of the pan and sluice. For hydraulic operations Wyoming has a wealth of water, the average annual rainfall, some 14 in., giving little idea of it. The large mountain areas lying above the snow line are the sources of numerous streams feeding the Laramie, the Powder, the Big Horn, the Wind, the Yellowstone, the Platte and other rivers. Many of these streams are perennial, so that their waters can be used without storage; on others, sites abound where dams can be built cheaply to store enormous quantities of water. This prevalent moisture, however, often makes it impossible for the poor miner to prospect to the bed rock. By the time he has excavated 6 ft. or so, of overlie, the water seeps in so freely that no "China-pump" or make-shift device can struggle with it, and he is drowned out. I saw hundreds of such abandoned holes, evidences not of the poverty of the placers, but of the inability of the prospectors to obtain proper appliances. With capital judiciously invested the gold output of the State will mount up rapidly.

GENEVA, N. Y.

WALTER S. CHURCH, Civil and Mining Engineer.

Electric Conveyance of Heat.—In a paper on the electric conveyance of heat, M. L. Houlléveigne mentions that the difference of potential between a conductor and iron is different accordingly as the iron is magnetized or not. One joint of a copper-iron couple was brought into a magnetic field, and the other left out. Since this arrangement could not give rise to a steady current without creating energy, an opposing electromotive force was to be expected between the variously magnetized parts of the iron. Such a difference of potential was, in fact, found, the balance being in favor of the less magnetized portions.

ON NITRIDE OF IRON.*

By G. J. Fowler.

This research was undertaken with the object of repeating and extending the work of Stahlschmidt on the same subject, his results differing in many points from those of his predecessors. The best way of preparing nitride of iron was found to be the following: Iron is reduced from the hydrate by hydrogen, in a tube of such dimensions that it can be weighed, together with its contents, and thus the end of the reaction determined without exposing the iron to the air. When complete reduction has been effected, the iron is heated in a fairly rapid current of ammonia gas, until no further increase in weight is observed. The temperature should be kept a little above the melting-point of lead. The product obtained when the reaction was complete was analyzed. The nitride so prepared has a composition corresponding to the formula Fe_2N_3 , it contains 11.07% N. and 88.46% Fe.

In another sample 10.94 N. was found. In a third case, in which the iron, after solution of the nitride in acid, was precipitated by ammonia, and weighed as oxide, 89.44% of iron was obtained, and 10.5% of nitrogen, showing again that the substance dissolves in acid according to the above equation, all the nitrogen being converted into ammonia. No percentage of nitrogen above 11.1 could be obtained, while any percentage below that could be got according to the time during which the iron had been exposed to the current of ammonia. These results are fully in agreement with those obtained by Stahlschmidt, and confirm his conclusion that only one nitride of iron exists, and that it has the above composition.

Nitride of iron is formed when iron amalgam is heated in ammonia, and also when ferrous chloride or bromide is heated in this gas. These methods, however, do not so readily give a product containing the full percentage of nitrogen, and free from the presence of a third element. It is a grey powder, rather less blue in tone than iron reduced from the hydrate. On rubbing it is more gritty than iron prepared as above. It is feebly magnetic. Heated in hydrogen, ammonia is produced at about the same temperature as that at which the nitride is formed. It readily burns in chlorine, ferric chloride and nitrogen being formed. Heated in carbon monoxide, no evidence of the formation of cyanogen compounds could be obtained. Steam at 100° slowly oxidizes the nitride, with evolution of ammonia. Hydrogen sulphide begins to react with it at 200°, forming ammonium sulphide and sulphide of iron. Heated in nitrogen to the boiling point of sulphur, no change occurs. The temperature at which nitrogen is evolved by the action of heat alone must therefore be above this point. From a slightly acidified solution of copper sulphate, nitride of iron deposits copper.

In conjunction with Mr. P. J. Hartog, the author has determined the heat of formation of the nitride by dissolving it in sulphuric acid contained in a platinum calorimeter, and observing the rise of temperature. Three experiments showed that the substance is formed with evolution of about three calories. In general the nitride of ammonia behaves as an ammonia derivative, the nitrogen being either evolved in the free state, or converted into ammonium compounds, according to circumstances.

NICKEL IN THE UPPER HARZ.

Nickel ore has been discovered in the Schleifsteinthal (Upper Harz), in Germany, about 5 kilometers south of Goslar, where there are two veins, a major and minor, both striking west-northwest, and dipping in parts to the south, and in other parts to the north. These veins have been known for many years, and have been worked for lead and zinc, from time to time. In 1892 the property passed into the possession of the Deutscher Bergwerks- und Huettenactien Verein (formerly the Commener Verein), of Bonn, which has continued its exploitation.

The major vein, which has been opened hitherto for a distance of 50 meters on its strike and to a depth of 40 meters, is broken by several small faults. A level 14 meters below the adit was driven west by the former miners until the lode was found to be cut off completely by one of these faults. A cross-cut 20 meters long run into the hanging wall failed to show the continuation of the vein, but the exploration work recently resumed there led to the new discovery.

The fault throwing the major vein consists of a fractured zone one meter wide, which has about the same strike as the country rock, but dips at an angle of 75° southeast, or in the opposite direction. The country rock is spiriferous sandstone (spiriferensandstein) of the Upper Devonian formation. In the fault fissure, which is plainly marked by selvages, and also in the adjacent country rock, are found streaks and veinlets of nickel ore. The width of these veinlets varies from 3 to 30 cm. (1 to 12 in.). The most important of them has been followed northeast 12 meters and southwest 7 meters, for which distance (19 meters) its continuity has been proved.

The vein matter consists of fragments of the country rock, calcite and pyrite, together with the nickel mineral, which is a sulpharsenide. Galena and blende which occur in the other veins of the district are wanting. The proportion between mineral and vein matter is variable, but not infrequently the whole of the 30 cm. streak is solid mineral. Analyses by Dr. Bodlander have given the following results: 1. Crystals: Nickel, 32.65%; cobalt, 1.00%; iron, 0.60%; arsenic, 45.20%; antimony, 1.96%; sulphur, 17.75%; insoluble residue, 0.95%; total, 100.11%. 2. Pure ore: Nickel, 30.15%; cobalt, 1.34%; iron, 0.84%; arsenic, 43.87%; antimony, 1.55%; sulphur, 16.09%; insoluble residue, 5.61%; total, 99.45. The mineral corresponds, therefore, to $Ni(AsS)_2$, or gersdorffite, which it has been determined to be.

This is the first time that a nickel mineral has been found in the northwest part of the Upper Harz. The discovery was made last summer. Whatever may be the outcome of it economically, it is of great interest geologically.

* Abstracted from a paper read at the Nottingham meeting of the British Association for the Advancement of Science, 1893.

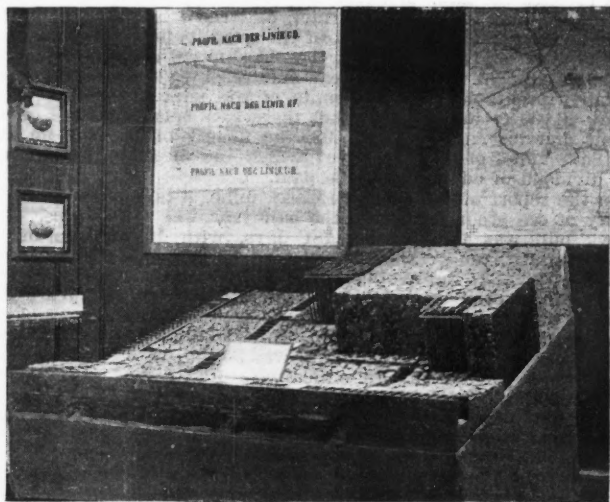
MINING AT THE COLUMBIAN EXPOSITION.

Specially Reported for the Engineering and Mining Journal.

THE GERMAN MINES EXHIBIT AT CHICAGO.

The German Mines Exhibit at Chicago illustrated well the great importance of this ever active industry in Germany, where it is also the oldest branch of industry. It was shown at the Exhibition arranged in groups, together with its auxiliaries and its technology. The exhibit was prepared under the direction of the Overberghauptmann Freund, with the advice of the Minister for Commerce and Industry, Freiherr von Berlepsch. The private mines and works co-operated with those of the government in order to give as comprehensive a view of the German mining industry as the limited space at its disposal allowed. The largest space was devoted to the coal mining industry, which in 1891 produced nearly 600,000,000 marks in value or about three-fourths of the total German mineral production. The nature of the coal beds of the great districts of the Lower Rhine, Westphalia, Upper Silesia and Saarbrücken was illustrated, together with the methods of mining and the industrial results of the work. This system of exposition was followed in each group of the mines exhibit. Particular attention was also devoted to show the precautions for the safety of the work-people in German mines. The improved and safer methods of mining which have been introduced in German collieries as a result of the investigations concerning explosions of firedamp and coaldust were fully shown. Further, a number of diagrams in the coal exhibit illustrated the proportion of wages to the total value of the output, while others showed the expenditures for the insurance of the work-people, which for example in 1891 in Westphalia amounted to more than 14,000,000 marks.

In the center of the mining and metallurgical exhibit was a pyramid of Siegerland spiegeleisen, which was constructed of the typical raw material—the rich manganiferous spar and red and



COAL WORKINGS AT ZABRZE, UPPER SILESIA.

brown iron-stone. Near by the rich metal mines of the Upper and Lower Harz and Upper Silesia were represented by products, models, and drawings. Each single step of the process of preparation—from winning the ore in the mine to the final products of the works—were shown by samples, while the weight-proportion between the crude and finished products was graphically represented.

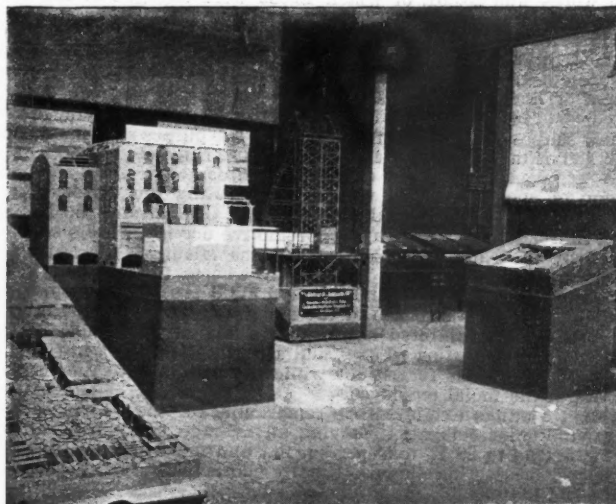
The collective exhibit of the Halle mining district and the provinces of Anhalt and Brunswick embraced the important brown-coal (lignite), salt and copper industries, the last mentioned employing with the exception of the Krupp establishments more laborers (17,000) than any other single industry in Germany. Its copper ranks among the best in the market, tests of its tensile strength, numerous samples being exhibited to show its quality. The salt industry of the district supplies the whole world with potash products, which are an indispensable auxiliary to the agricultural and chemical industries. The brown-coal industry furnishes the briquettes which are exclusively used for house fuel in North Germany, while another branch, the paraffine industry, has the production of tar, paraffine and wax as the object of its comprehensive operations. In the "Bernstein" exhibit the firm of Stanten & Becker showed a material which is found only in Germany, including numerous samples showing its occurrence, the products of its preparation, and a collection of all the species so far found.

The German mines exhibit concluded with the displays of the mining and technical schools, and the geological survey. The last mentioned illustrated its work by maps and relief models, while among the former the technical school at Aachen (Aix-la-Chapelle) was represented by models, which were intended to show the system of technical instruction. Together with these there was an exhibit of the methods of surveying, which showed, together with old and new mine plans, the most important instruments used in underground surveying formerly and at the present time.

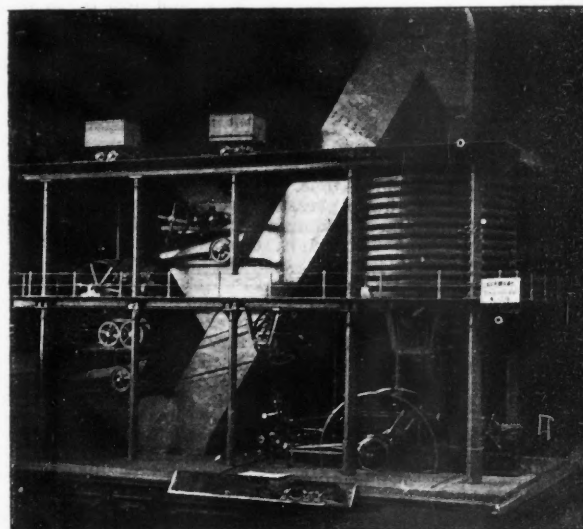
The accompanying illustrations are from photographs, and are selected from a large number. We regret that the necessary limitations of our space prevent us from giving more engravings from this

admirable exhibit. The first shows a model of a colliery in Saarbrücken district, including sections of the mine itself, the hoisting and other works, illustrating the entire method of handling the coal from the lowest slope of the mine to its final delivery into cars for transportation. The engraving will largely explain itself. The second shows the working of the Schuckmann coal vein at Zabrze, in Upper Silesia. This seam is 35 ft. thick, and is worked in its entire thickness at once, the principal reason for this being the nature of the overlying schists, and the tendency of the coal to spontaneous combustion when exposed to the air. The method of mining, as indicated, is to remove the entire thickness of the coal at once and to fill up the chambers of the mine as fast as they are worked out.

The third engraving shows the model of a plant for making briquettes or pressed fuel from lignite or brown coal in the Halle district. The lignite as brought from the mine in cars passes through two sets of screens and a set of rollers for crushing the larger pieces. From the last screen the crushed coal is carried by an elevator to the top of the driver, which consists of a set of double plates heated by steam, the material being carried onward over these plates by



MODEL OF COLLIERY AT SAARBRUCKEN.



MACHINERY FOR MAKING BRIQUETTES FROM LIGNITE.

revolving arms. After passing the dryer it contains only 20% of water, instead of the original 50%. It is then passed by a large hopper into the press. The mold is formed by four pieces of steel so that the size of the briquettes can be varied according to the amount of moisture contained. The pressure on the mold is given by a steel stamp and the working of the press is automatic, at each stroke of the stamp the pressed cake being thrown out and the row of briquettes moved forward. At Halle it is not necessary to use any bitumen or other binding material, as the coal itself contains sufficient to retain its form after pressure. This kind of fuel is very largely used in Germany and other countries in Europe, and the study of this plant would be valuable with reference to the utilization of our waste and culm piles in the anthracite regions.

The German Mines Exhibit was distinguished notably in its system from those of most of the other States which confined themselves to showing their raw material and finished products without representing the intermediate phases of the industry. It is by an extended representation of these, however, and by an explanation of processes by diagrams that industrial methods are best shown. The officials in charge of the German Mines Exhibit, therefore, have

been much pleased to find their system of exhibits recognized as specially instructive by all visitors. To Dr. Konrad Engel, Royal Prussian Commissioner for the Mining Division, we are indebted for the accompanying photographs, and for the material from which this brief notice has been prepared. We hope hereafter to supplement this account by some description of the details of this admirable exhibit.

THE KRUPP STEEL EXHIBIT.

Of this, which properly forms part of the German display, though in a separate pavilion, it may be said that the house of Fried. Krupp, not intending to place an exhibit until a late hour, did not have sufficient time to manufacture special exhibition pieces, but was compelled to make a selection for this purpose from the stock on hand, and in many instances from goods intended to fill orders previously received. It is therefore less difficult to form a correct idea of the great variety of work produced by this firm than would be possible had the articles displayed been manufactured expressly for exhibition purposes.

During the past 17 years this establishment has made rapid advancement. In 1892 the total number of persons employed at the Krupp works was 25,301, of which 16,956 were engaged at the steel works at Essen.

The Krupp Pavilion, at the Fair, is 196 ft. in length; 82 ft. in width and 42 ft. in height. Attractively arranged about the inner walls are representative types of the various products of the casting department of the works at Essen. The display in the railroad department consists of a collection of more than 50 tires of varying diameter, and shapes with segments cut out for the purpose of illustrating the method of fastening by means of retaining rings.

There are spoke wheels of cast steel and forged iron; a complete collection of spoke and disc wheels, representing the various types used by the New York Central, the Michigan Central and the Illinois Central railroads, and a display of locomotive driving wheels such as are used by the New York Central and the Michigan Central. The strength of these is shown by three spoke wheels, two of which have been twisted and bent cold under a hydraulic press for the purpose of proving the tensile strength of the material used which, when subjected to the test, exhibited a breaking strain of 23.43 tons to the square inch, an elongation of 31%, and a contraction of area of 60.9%.

The third wheel was forged out while hot to illustrate the forging properties of the metal employed.

The steel castings exhibited are remarkable for their softness and their capability of elongation, having an average breaking strain of from 24.13 tons to 28.57 tons per sq. in., and an elongation ranging up to 34%. These properties are equally characteristic of the heavier castings and plates.

The cross sections of numerous test pieces selected from the exhibit prove the qualities of the material employed, and are free from porous spots, and of homogeneous structure throughout.

In this exhibit there is the bed of an engine for a fast cruiser. This weighs 6.21 tons, and a test bar 7.87 in. long and 0.79 in. in diameter taken from it gave a breaking load of 28.89 tons to the square inch, an elastic limit of 14.73 tons per square inch, an elongation of 22%, and a contraction of area of 50%. There is also a stem-casting, a stern post and a rudder frame for a large war vessel, each cast in one piece.

A ship's propeller is exhibited with its shaft, consisting of the screw shaft, the thrust shaft and the crank shaft, connected as they would be in actual service on board ship, and having a total length of 90.34 ft., and a weight of 103.34 tons. The several parts of this shaft were forged solid by hydraulic pressure from ingots ranging up to 4.59 ft. in diameter, and the coupling flanges were forged on direct. The crank-shaft, weighing 65.54 tons, consists of three crank-pins, six webs and six coupling journals, combined to form three cranks 120° apart. The screw shaft, weighing 21.06 tons, is connected with the thrust-shaft, weighing 14.76 tons, by means of nine bolts, each weighing 154.3 lbs. When used on board ship, a number of intermediate shafts are arranged between the screw-shaft and the thrust-shaft, so that the total length of shafting used is about 170.6 ft.

Tests of six bars taken from this shaft gave the following average results: Elastic limit in tons per square inch, 12.11; breaking strain, 27.10; elongation, 27.28%; contraction of area, 53.46%. The entire shaft as well as the crank-pins are bored longitudinally. Each of the propeller blades weighs 4.42 tons, and is fastened to its boss, weighing 7.66 tons, by means of gun metal nuts; the total weight of the propeller is 25.81 tons.

Immediately under the shaft above described, is exhibited a hollow shaft which was milled on a lathe, the bed of which has a length of 111.5 ft. The maximum turning length of this lathe is 98.4 ft., and the height of centers is 2.29 ft. This shaft was forged solid from ingots of crucible steel 8.85 ft. in length and 4.1 ft. in diameter, by hydraulic pressure, to a length of 82 ft., and a diameter of 11.81 in. It was afterward bored longitudinally to a diameter of 4.32 in. A breaking test of a bar taken from this shaft gave the following results: Breaking load in tons per square inch, 30.73; elastic limit, 16.57; elongation, 25.8%; contraction of area, 55.1%. In the east extension of the pavilion there is a collection of five armor-plates, two of the compound type having a thickness of 11.3 and 15.7 in., and three of nickel-steel with a thickness of 10.2, 11.3, and 15.7 in. Plates of the same thickness have been subjected to the same tests by projectiles from guns of the same caliber at a distance of 390 ft. The compound plates are distinguished for the excellent union of the steel with the iron, and after having been tested as above described exhibited no tendency to separation.

The nickel-steel plates are more remarkable for their great capacity to resist perforation. There is a plate of ingot iron in this pavilion that has a weight of 61.41 tons, a length of 27.13 ft., a width of 10.26 ft., and a thickness of 1.01 ft. This plate was rolled on Krupp's armor-plate mill from an ingot weighing 73.81 tons, and was intended for a hydraulic bending press of 5,000 tons pressure.

A boiler head of Siemens-Martin ingot iron illustrates the width attainable in the plate-rolling mill. It has a diameter of 12.79 ft., a thickness of 1.5 in., and weighs 3.38 tons.

There is also exhibited in this pavilion the largest boiler plate ever produced. This plate is also of Siemens-Martin ingot iron, weighs 15.94 tons, is 1.26 in. in thickness, 10.82 ft. in width, and 65 ft. long.

The advantage claimed from the use of plates of such proportions is the possibility of making boilers with only one riveted seam in the circumference.

There is also exhibited a large and complete assortment of steel products, pressed and forged in dies, and mention should be made of the guns completed and mounted, some of which we have already described. In contradistinction to these exhibits there are to be seen sheet rolling mills, mint rolls, and tinsel and gold rolls, all highly polished, of crucible steel. The extent and variety of the exhibit is very great.

ABSTRACTS OF OFFICIAL REPORTS.

SIERRA BUTTES GOLD MINING COMPANY, LIMITED.

The report of this company for the half-year ending June 30th, last, was presented to the stockholders, in London, October 19th. The report for the half-year of the Sierra Buttes mine shows that the quantity of ore obtained from the North Cliff vein during that time was 3,400 tons, in addition to which 20 tons came from the old dump, making the total ore product 3,420 tons. The Reis mill ran 171 days and crushed all the ore produced. The value of the gold extracted by mill process was \$13,377; the average yield per ton of the ore was \$3.91; the cost of working was \$2.16, and the profit \$1.75 per ton. Mr. William Johns wrote as follows under date of August 25th, 1893, in reference to the condition of the mine: "We are opening up no new ground, but are simply searching for and gathering up crumbs left by the original owners of the property. Our operations are confined to Nos. 3, 3½ and 4 levels, on the North Cliff vein, and consist in the reopening of these levels, which were caved, and extracting the pillars that were left, and stripping the old stulls in those places where there is quartz enough mixed with the waste to pay running it through the mill. Between Nos. 4 and 3½ levels, there is considerable ore that will pay to extract, and there is some above the 3½, but we cannot write definitely of the quantity because we do not know the exact state or extent of the old stopes. There is evidently ore enough in sight to last the year out. The workings so far have been fairly profitable." The accounts of the mine show that after carrying £3,000 to the reserve fund, there is a balance to the credit of profit and loss, including £3,798, the moiety of profit from the Uncle Sam mine, of £3,977; out of which the directors recommend that a dividend of 6d. per share be paid.

From the report of the Plumas-Eureka mine, it is learned that the quantity of ore produced during the half year was 17,565 tons. The Mohawk mill was in operation 181 days, with an average of 38 stamps running, and crushed 17,580 tons of ore, the gold yield of which was \$62,232; the average yield of the ore in free gold was \$3.74 per ton as compared with \$4.12 for the previous half year; and the proportionate yield of the sulphurets saved was 12c., making the total yield \$3.86 per ton. The cost of mining, prospecting, etc., was \$2.70 per ton, the cost of milling was 35½c., the cost of treating the sulphurets per ton of ore milled was 10½c., thus making the average working cost \$3.16 per ton, as compared with \$3.52½ in the preceding half year. The quantity of sulphurets saved was 194 tons, and 455 tons were treated. The value of the gold obtained was \$5,089, and the profit on the working was \$3,273. The condition and prospects of the Plumas-Eureka property are described in the following extracts from a letter of Mr. Johns dated August 22d: "No new developments have been made. No profitable ore has as yet been exposed by the works at and above the Jenkins tunnel, nor are we confident that there will be. . . . There is an abundance of ore connected with the various stopes to last through another year if the quality shall be maintained as it now is, and has been, in the face of the stopes for some time. As it has been of nearly uniform quality, there is no reason to expect a continuance, at least for a few months. . . . Stopping is being done in the No. 3 and No. 2 Wright's veins, and on the Hosking vein above the No. 3 and No. 2 levels, and the cross drift. The general appearance of the stopes has slightly improved. The mill is in fair condition." The accounts of the mine for the half year show a balance to the credit of profit and loss of £8,936, out of which the directors recommend a dividend of 9d. per share, amounting to £5,273, and that the balance remaining to be carried forward.

The report of the Uncle Sam mine for the half year shows that the quantity of ore extracted during that time was 10,113 tons, of which 1,955 tons came from the North vein, and 8,158 tons from the South vein. The quantity of ore milled was 10,106 tons, yielding gold bullion to the value of \$86,222, an average of \$8.53 per ton. The proportionate yield from the sulphurets was \$1.17½ per ton of ore milled, making the total product of the ore \$9.70½ per ton. The average cost per ton of mining, prospecting, etc., was \$3.55; milling, 34c.; treating the sulphurets, 43c., making the average working cost, \$4.32 per ton. The mill was driven by water power throughout the half year, which resulted in a saving of 30c. per ton in the milling cost as compared with the previous term. The quantity of sulphurets obtained from the ore was 152 tons, and 156 tons were treated at the chlorination works. The gold extracted therefrom amounted to \$11,877; the cost of treatment was \$4,362, leaving a profit of \$7,515. The average yield per ton of sulphurets was \$76.13½; cost of working was \$28.26. From the report of Mr. Johns on the half year's operations, it is learned that the mine is in a satisfactory condition and with extensive supplies of ore laid open. It is estimated that there are six years' supply of ore in sight. The only development work being done at present is in running the No. 3 level west on the South vein, and the 3½ level eastward on the North vein; in the No. 3 westward the vein is badly broken up and the

quartz is of no value. The stopes on the Prout or middle shoot have a length of ore 300 ft., averaging 6 ft. in width. This ore is above the average in quality. In the main shoot the stopes are all in good order. The No. 3½ level on the North vein has been run 204 ft. The vein is only 18 in. wide in the present end, and is of low grade. Along the level it is from 18 in. to 5 ft. wide, and will yield from \$6 to \$7 per ton. The mill and chlorination works are in good condition. The new road to the timber is nearly completed.

A WELDLESS STEEL CHAIN.*

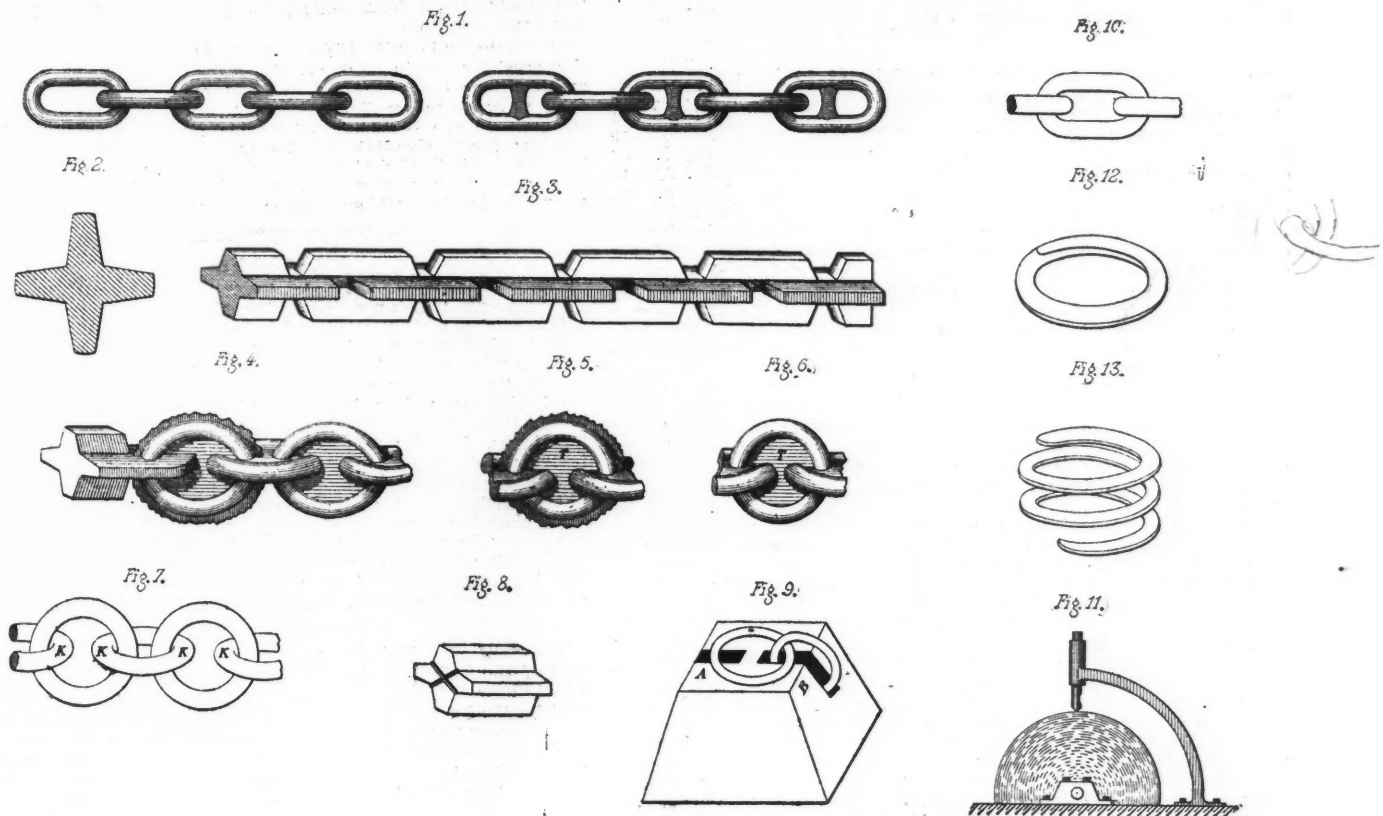
By M. Simon-Brunschwig.

A process of manufacture of weldless steel chains, which has been devised by M. Oury, of the Arsenal at Cherbourg, France, is illustrated in the accompanying diagrams. When completed it has the same form as an ordinary iron or steel chain, and cannot be distinguished by its appearance, as shown in Fig. 1. The chain itself is made without welding by a series of stamping processes under the steam hammer, from bars made of steel capable of resisting a breaking strain of from 42 to 45 kilograms per square millimeter of section, with an elongation of from 20 to 25%. These bars are rolled in such a form as to show the section of a regular cross with four equal arms, as shown in Fig. 2. The first step is to heat the bars to a red heat in a special furnace and then pass them through a shearing machine which cuts out a portion of the metal alternately on each arm leaving it in the form shown in Fig. 3. When this is done the small holes, the purpose of which is shown further on, are pierced in the cold bar. The bars are then reheated in the furnace, and are passed

stamping processes, and we have then a chain without a weld, formed of round and regular links, the length of course being determined by the length of the bar. The chain is then once more heated in the furnace and passed through the final press which gives the usual oval form to the links, as shown in Fig. 10. It is then at last finished and it only remains to cool it gradually and to submit it to the necessary test.

As soon as it is cooled each length of chain is taken to the testing machine, which has a capacity of 200 tons. Chains made of mild steel are expected to show a minimum resistance of 42 kilograms per square millimeter to breakage. If this test is passed, the whole length of the chain is submitted to a working load of 18 kilograms per square millimeter. Some very remarkable tests have been made of different lengths of chain, showing the superiority of the weldless chain of mild steel over iron chains made by the ordinary method. A special test made as to the wear of iron of good quality and the steel of which these chains were made was carried out in this way. Two bars, one of iron taken from a chain of the best quality, the other of steel of the same diameter, the same length and the same weight were placed in turn in a clamp above an emery wheel revolving at a regular speed for a period of 10 minutes. The bars were then weighed to show the loss due to abrasion, when the steel bar showed a loss of three grams, the iron no less than eight grams.

As noted above, the length of the weldless chains is necessarily limited by that of the rolled bars from which they are made. In order to join two sections of this chain we must have a link of the same form which will when in place have the same resistance to breakage as the section joined. The link designed by the inventor for this purpose is shown in Figs. 12 and 13. It is formed from a bar of steel of calculated length which is wound in helical form. The ends of



MANUFACTURE OF WELDLESS CHAINS.

under a series of steam hammers or forging presses each carrying a special die. The successive forms assumed by the bar after each operation are shown in Figs. 4, 5 and 6. It will be seen that the action of the dies forces the metal by degrees into the form of a chain, leaving only in the center of the links a very thin plate of metal. This plate is finally cut out by a special machine. The bar is now transformed into a series of links held rigidly together which must be detached from each other. It is in preparation for this operation that the four holes referred to above were drilled. These holes, which were pierced at equal and definite distances, were placed in pairs in the same axis of the bar, as shown in Fig. 8, and are now found at the inner point of contact of the links, in such a way that the latter are held together only by four threads of metal and can be easily detached from each other. This separation is made by means of a small steam hammer, and we then have a chain of which the links are free but are still somewhat imperfect and are circular in form. The chain must then be again heated and passed under a new series of hammers or stamps supplied with round dies, as shown in Fig. 9, in such a way as to give the links a true circular form, and to do away with the imperfections left in the preceding operation. When a link falls into the die the two adjoining ones are perpendicular to the first and take their places in the slots A and B, Fig. 9. This operation is repeated several times in order to take away the fins and roughnesses left by the various

the two sections of chain to be joined are passed into this link while the spiral is still open. It is then heated to a white heat and the spirals are welded together, the link having the same thickness as the other links of the chain. It is brought into an oval form under the die and it is impossible afterwards to pick it out by the eye. Special precautions are taken to secure a perfect weld and it sometimes happens that two heats are necessary to complete it. It is claimed, however, that it is not necessary that the whole surface should be welded, as sufficient strength is secured if only the edges of the bar are welded, and this has been shown by tests made.

In a special trial made by the Engineer of the Bureau Veritas, a chain of this kind sustained without breaking a load of 110 tons, while an iron chain of the same size and of the best quality broke under a load of 83 tons. It is claimed that for hoisting and other purposes steel chains made by this process present many advantages and can be used of a much lighter weight than iron chain for the same service. There being no weld there is no weak point. The wear by abrasion between the links is less than with an iron chain; oxidation is slower and breakage is very unlikely, as an excessive load will be made manifest by the elongation of the links before the breaking point is reached, while with the ordinary iron chain there is no such warning given.

Chains by M. Oury's process are now made by the Massardiere Forges, in France, of several different sizes, and are being introduced in several mines and other establishments in that country.

*Translated and abstracted from article in the "Revue Universelle des Mines."

THE TESTING OF PORTLAND CEMENT.

By Pierre Giron.

The adoption of more rigorous rules for testing Portland cement is to be desired, for the protection of engineers and architects, and to encourage those whose efforts are to give to the trade a more valuable product. The first point to be considered is the fineness of grinding. For this test three sieves are necessary, Nos. 50, 80 and 200. Weigh accurately 100 grammes of cement. Pass it through the finest sieve (No. 200); the residue being weighed, will give at once the percentage upon the sieve. What passes through a No. 200 sieve is the impalpable portion of the cement. The residue on No. 200 sieve is then thrown on a No. 80 sieve, and what is left being weighed constitutes the percentage of residue upon sieve No. 80. The residue on a No. 80 sieve is finally thrown on No. 50. What cannot pass through this sieve is weighed, and constitutes the percentage of coarse grains in the cement. A well made Portland cement will leave nothing on a No. 50 sieve. The residue on No. 80 will be from 5 to 7%, and from 25 to 30% on No. 200. Some brands of Portland cement will leave from 15 to 20% of residue on a No. 80 sieve, and from 40 to 50% on No. 200. Those cements should be rejected. The inspection of the residue will indicate the quality of the cement. The presence of particles of coal shows that the selection of the clinkers has been carelessly done. Soft yellow grains show that under-burned clinkers have been mixed. The residue should be composed of nothing but hard black grains with sharp angles.

The specific gravity of Portland cement is between 3.050 and 5.175. It can be determined very accurately with various apparatus. The sample should not be sifted beforehand, but treated as it is. The presence of foreign matter, even in small amount, can be at once detected by the specific gravity test. The most common adulteration is to add slag to the cement. But as the density of slag is only 2.8, it follows that an objectionable proportion of slag in the cement would lower its density below 3.05, which should be considered the lowest that can be tolerated.

As to chemical composition, it is advisable to have the cement analyzed, as it will give valuable information on the product. Analyses made from English, American, German, French, and Belgian cements show that the quantity of each element varies between the following limits: Silica, 20.50 to 26.10%; alumina, 5.20 to 10.60%; oxide of iron, 2.10 to 5.30%; lime, 51.20 to 67.31%; magnesia, 0.33 to 2.80%; sulphuric acid, 0.26 to 1.78%. The degree of hydraulicity, which is determined from the chemical composition, is the first thing to be considered. The relation between the silica and alumina on one hand and the lime on the other constitutes what is called the "degree of hydraulicity." It should not be below 0.43, and when the cement is to be used on work in sea water it should be raised to 0.46. Oxide of iron should not exceed 4%. In some specifications a higher percentage of oxide of iron is considered unsafe. Magnesia must not exist beyond 3%; any cement having more should be rejected. Magnesian cements give very good results in tensile strength, and work done with them may look very well for several months and even several years, but in the course of time swelling takes place, and with such force that nothing can resist it. Even 1% of sulphuric acid would be dangerous if the cement was used in sea water. In soft water or in the air, however, the presence of 2 or 3% of sulphate of lime has no injurious results.

The initial setting of Portland cement, gauged neat, should not begin before 30 minutes, and the final setting should not take place before three hours. In the case of imported cements, which may be from three to 12 months old, it will take sometimes 12 hours, or even more, before the sample gets hard. A more freshly made cement will usually set in four to seven hours, and this is more satisfactory. Of all the qualities in cement the setting is the most difficult to regulate. A carefully-made cement may sometimes be very quick setting, while an inferior cement may be very slow setting. Nevertheless, slow setting is almost essential in Portland cement, and manufacturers can always, in the case of a well-made cement, make it slow setting by exposing it to the air in thin layers.

The test for stability in volume is an important test, and should never be omitted. Briquettes or cakes of pure cement, 24 hours after gauging, are immersed in boiling water; if the samples show no alteration at the end of six or 12 hours, the cement may be considered perfectly safe. A dangerous cement will disintegrate or blow. The test for hydraulicity in cold water is no longer considered reliable by experts. Boiling water will bring out in a few hours the effects of free lime. An excess of sulphate of lime may also cause the disintegration of the cement, especially in sea water. A solution of calcium chloride at 40 or 60 gr. of anhydrous salt per litre should be used to max the cement, and the samples immersed after 24 hours in the same solution. If the cement contains from 3 to 4% of sulphate of lime, at the end of a few days, the samples will show signs of cracking.

For tensile strength briquettes of 1 sq. in. section are almost universally used now. The quantity of water mixed with the cement has much influence on the tensile strength. An excess or a deficiency of water is equally injurious. The proportion of water to be used may be from 20 to 30%, according to the nature of the cement. The paste ready to be put in the molds should be stiff, brilliant and plastic. The 24-hours' test has no value. Briquettes are broken at the end of seven and 28 days. Neat cement should stand at least a strain of 400 lbs. without rupture at seven days and 500 lbs. at 28 days. It is not uncommon to see certain brands giving much higher tests. Portland cements of superior quality, when tested neat, show a rapid increase in strength, and the maximum (from 800 to 900 lbs.) is attained in a few weeks or a few months. Cements of inferior quality test low in the first period of hardening; they may increase in strength, in the course of time, but they will never test as high as the best. It is preferable in practice to use cements which set slowly and harden rapidly. The work is thus in a short time protected

against deterioration. The greater the initial strength the surer the success of the work. Cement is never used neat, however, and the strength of a neat briquette after a long time presents but little interest. The strength of cement mixed with sand is much more important.

To test the tensile strength, a mixture in equal parts of sand and cement will attain the same strength as pure cement; and even with some sands of good quality the mixture would test higher than neat. If a sand briquette is immersed in water for a few days only and then left in the air the tensile strength will be considerably higher than if the sample had always been under water. The same results occur in practice; and all masonry works should be, as far as possible, kept wet during the first few days. For the sand test a standard sand, made of crushed quartz should be used. The mixture of three parts of cement to one of sand, by weight, has been adopted everywhere, and should be adhered to for the sake of comparison. Much difference of opinion exists as to the amount of water to be used and the manner of filling the molds. In Europe the official rules prescribe generally 10% of water. A sufficient quantity of mortar to fill one mold is weighed, and this is pressed firmly with a guide and a hammer until the water appears at the bottom of the mold. In America, a little more water is used, and the mortar is filled loosely in the mold. There is no compression of the mortar except what the operator may apply with the trowel. The object of the European mode of testing is to bring out all the strength there is in the cement, and to do so by mechanical means, which are constant and independent of the skill or experience of the operator. The results of this method agree very closely. The American system of testing comes nearer to the practical use of cement, and engineers give it the preference on this account. But by this method the sand tests differ widely, and it is difficult to form an accurate opinion of the comparative value of a given brand. A mixture of three parts of standard sand to one of cement, under the American mode of testing should give a minimum tensile strength of 125 lbs. in seven days and 175 lbs. in a month.

Elaborate and expensive apparatus is used in Europe to estimate the crushing strain that cement should stand, and in the official specifications the results of this test are considered more important than those from tensile strength. Tests are also made for bending strength with a bar made of mortar, having a standard length and section; for imperviousness, by means of water pressure; for adherence, with blocks of mortar on marble or glass plates. But these tests have not yet been adopted in the United States, and they offer no particular interest, except for special researches.

USES OF MAGNESIUM.*

Magnesium, which now comes into the market in the form of plates, cubes, sticks, ribbon, wire and powder, is used chiefly as an illuminant in photography and signaling. Recently it has been employed in refining metals to reduce metallic oxides contained therein, for which its great affinity for oxygen makes it a powerful agent. Copper, refined with magnesium, is perfectly homogeneous, and free from blow-holes, thereby forming the best material for the manufacture of fine brass. Equally favorable results are obtained with magnesium in the purification of alloys of copper, like German silver, brass, etc. It is also employed in the steel industry as a desulphurizing and dephosphorizing agent, magnesium combining with sulphur as MgS and with phosphorus as Mg₃P₂, which rise to the surface, whence they can easily be removed. In chemical technology magnesium has been used with advantage in dewatering oil, alcohol, and ether, while it has been recommended as a substitute for zinc in galvanotechnics on account of its purity, chemical strength, and electromotive power.

The California Midwinter Exposition.—Contracts have been let for two of the buildings for this exposition at San Francisco, and the site is now being graded ready to begin work. The main building will be 450 by 200 ft., and the Mechanical Arts Building 275 by 175 ft. A tower 266 ft. high is to be erected on the grounds. Many exhibits have already been promised, including a fine electrical display. The mining interests of the State of California are also making preparations for a large exhibit.

Population of India.—The census of India for 1891 shows a total population of 287,223,431, of whom only 6% can read and write. The average population per square mile is 184. The population of the British provinces is 221,172,952, or 77% of the whole, covering an area of 61.85%. Of large towns there is a comparative paucity, 1,401 out of a total of 2,035 not containing 10,000 inhabitants—Bombay, containing 821,764, being first, and Calcutta ranking second, with 741,144. There are 207,000,000 Brahmans, 9,000,000 Animists, nearly 2,000,000 Sikhs, 1,500,000 Jains, 7,000,000 Buddhists, 57,000,000 Mussulmans, and 2,000,000 Christians.

A Profit-Sharing Concern.—One of the largest profit-sharing concerns in the world is the N. O. Nelson Manufacturing Company, of St. Louis. At its works in Leclaire and Mound City, Ill., and St. Louis it employs 500 hands. During the seven years ending with 1892 it paid to wages a total dividend of 54%. In 1889 the day's work was fixed at nine hours without reduction of wages. Early in July last, owing to depression in its trade—that of plumbing ware—all concerned decided that three-fourths of the wages should be paid in cash, the other fourth to be paid whenever the net profits should exceed interest on capital at 6% during the months of full pay, and at 4½% during the term of three-quarters pay. On October 1st the company's business had improved to a point warranting return to the full cash payment of wages. Throughout the summer the entire force worked full time.

* Abstract from article in "Dingler's Polytechnisches Journal," 287, 10, p. 240.

MODIFICATIONS OF CARBON IN IRON.*

By Prof. A. Ledebur.

In this paper the writer began with the observation that as far back as the end of the last century the observation was recorded that iron which had been produced by fusion with charcoal contained carbon. It was soon afterward recognized that this carbon in the iron was not always present in the same form, and that it consequently affected the behavior of the iron in different ways. Karsten, in his early time, distinguished between graphite and combined carbon, and he was of the opinion that this combined carbon must be a constituent of a true chemical compound with iron or atomic proportions—that is, of a carbide. He was unsuccessful, however, in his attempts either to produce or to separate this carbide. This classification, of Karsten's, of the total carbon in iron into two main modifications—graphite and combined carbon—formed, until quite recently, the basis adopted in all textbooks relating to the metallurgy of iron, for the consideration of the mode of occurrence of the carbon, and of the influences which this element exerts on the properties of that metal. All analyses published in the first nine decades of this century, in which the analysts did not rest satisfied with determining simply the total percentage of carbon, gave, even then, only the two above-mentioned forms of carbon. This division was, however, completely valueless in the case of true steel—of metal, that is, that might be hardened—whose behavior was entirely different, according to whether it had been permitted to cool slowly or had been cooled rapidly by plunging in water. Its percentage of carbon remained in both cases unchanged. An examination made in the manner formerly in vogue only showed the percentage of the so-called combined carbon, and yet the hardened and unhardened or annealed steels showed greater differences than did those of many different metals. The first of four modifications of carbon was graphite. Although the true cause for the formation of graphite must be deemed to be the power possessed by molten iron of dissolving more carbon than the solid metal could retain in solution, yet this difference in the degree of solubility did not always exist in exactly the same ratio. It was determined by the percentage of other foreign substances in addition to the carbon that were present in the iron, and especially by the silicon present. Silicon formed a necessary constituent of grey pig iron, but only a brief period of time had elapsed since this important part played by the silicon had been recognized. A second modification of carbon, resembling graphite, was the temper-carbon. The name was chosen for the reason that this form of carbon was mainly formed during the prolonged heating of white pig iron during the tempering process. A third modification of carbon, which had been known to metallurgical chemists for a somewhat long period, without having been properly appreciated, might be best named carbide carbon. As in the case of the formation of graphite, the formation of the carbide was influenced by the nature and method of the cooling. Slow cooling aided the formation of the carbide, and rapid cooling rendered it more difficult. The fourth of the modifications of carbon now known was termed hardening carbon. It was evenly divided or dissolved throughout the whole mass of the iron, the mother metal, and escaped as an unpleasant smelling hydrocarbon gas, even at the ordinary temperature, if the iron was dissolved in dilute sulphuric or hydrochloric acid.

In a discussion which followed the reading of this paper, some exception was taken to the statement that silicon forms a necessary constituent of grey pig iron.

THE NEW FURNACE OF THE BROKEN-HILL PROPRIETARY COMPANY.†

The new furnace at this mine is described as a 100-ton furnace. It is water-jacketed throughout. The top half of the furnace consists of four hollow-wrought steel jackets, three being 9 ft. 9 in. deep, and the fourth, which carries the flue, is 8 ft. deep. The water is fed in at the bottom of each jacket, and all the jackets are connected together so as to make sure of an equal circulation of water through them all. The two side jackets have two lugs, and the two end ones three lugs riveted on the outside of them, and which rest on an oblong frame of 8 in. I iron, the corners of which rest on four hollow cast iron columns or pillars. The jackets are then fastened together with a wrought iron strap passing around them. Between the bottom edge of these jackets and the top of the crucible is a space of 5 ft., where the cast iron jackets go. The lower half of the furnace consists of 20 jackets in all, each 20 in. wide. There are six jackets on each side with tuyeres and four corner jackets without tuyeres, the 16 being cast iron, and there are four wrought steel end jackets, each with a tuyere opening in them. The tuyere openings are in the middle of the lower half of the cast iron jackets, and not as they are in the other blast furnaces in Broken-Hill, between two jackets. The water is fed into each jacket, about the middle of its length, and as it is closed at the top it is kept full and under a certain amount of pressure of water by a goose-neck arrangement for the overflow of the waste water, which delivers the water into a copper launder some 9 in. above the top of the jacket. This launder is by this arrangement made a fixture and need not be moved when it is necessary to remove a jacket. All the water from top and bottom jackets, tuyeres, breasts and slag spouts delivers into this launder, which empties into the hollow columns from which pipes carry the water to the cooling tanks. Each of the lower jackets has three legs on each side of the front face, so that the whole 20 can be bolted together. To further strengthen them a binder made from steel rails is also bolted around them just above the tuyeres. A pressure of about 30 tons from the charge in the furnace has to be resisted. Usually before a jacket is to be removed and the girder just spoken of taken off the furnace, the jackets are propped up to prevent them from bulging out with the weight of the charge. These props are always in the way, and to do

away with them a jacket fastener has been introduced, which fulfills the same duty. It consists of a carriage, which slides along the under side of a girder fixed between the columns slightly above the level of the top of the lower jackets, through which passes a square-headed screw, the point of which enters a small hole countersunk in the face of the jacket when screwed up tightly, so that the jacket cannot move in the slightest degree. When a jacket has to be removed the screw is loosened and the carriage slid along the girder out of the way. The binder is taken off the outside of the jackets, and then the jacket is ready to be pulled out. There are 24 of these jacket fasteners, one being used for each jacket, except the corner ones, which have two. The crucible of the furnace is similar to other crucibles on the Hill. The general design of the furnace is similar to the No. 2 furnace now in blast, which is from plans of Mr. Howell. It is expected that this furnace will be an extremely handy one as far as its fittings go, and experience has proved the design to be the best in other ways, although the scarcity of water in this district has prevented it being more generally used.

When the three furnaces are in full blast they will have a capacity for treating between 1,000 tons and 1,100 tons weekly, so that the output of bullion in the future will be considerably augmented.

NEW APPLICATIONS OF THE HOT BLAST.*

As the manufacture of iron is by far the most important and the largest of our chemical industries, it is not surprising that it should have caused to be evolved and put to extended use an excellent and economical method of heating large volumes of air, but it is perhaps somewhat curious that no attempt seems to have been made hitherto to adapt the process to other important branches of industrial chemistry. This stigma is on the way to be removed, as the late Mr. Cowper recently pointed out at a meeting of the London Section of the Society of Chemical Industry, that many further applications were possible. In cases where a uniform temperature, and one easily under control, is desirable, as in the subliming of camphor, the hot-blast stove can be adopted with economy. A still more important application is in the concentration of sulphuric acid, a matter to which, as it happens, much attention has lately been devoted. The old plan for obtaining sulphuric acid stronger than that which could be produced by evaporation in open lead pans, consists in boiling down the acid in retorts, which may be made of glass, which is fragile, or of platinum, which entails a heavy expenditure of capital. With platinum, moreover, there is a large charge for depreciation, the metal being quite appreciably attacked in heavy continuous work, sensibly raising the cost of production of each pound of strong acid made. So considerable is this depreciation, that recourse has lately been had to the coating of the interior of the retorts with gold, which is rolled on when the metal is in the form of an ingot. In spite of the cost of the gold, a real saving results from its use. In order to get over the difficulty of obtaining a material of which retorts indifferent to the action of the acid could be made, several methods have been devised in which the retort is abolished and the acid concentrated by passing through a series of porcelain pans set terrace-wise, so that the acid can drop from one to the other, meeting in its course the hot gases from a furnace set at one end of the series. In place of the furnace gases used direct in this manner, a hot blast from a Cowper stove could be advantageously substituted, as there would then be no risk of contaminating the acid with flue dust and the products of imperfect combustion. The roasting of lead to its oxides, litharge and red lead, could also be better accomplished than by the present methods, as the temperature is more readily controllable, a matter of primary importance, especially in the case of the latter product, which can only be formed within comparatively narrow limits of temperature.

But perhaps the most interesting application of the hot blast stove is one which has already come into practical use. In the process of recovering chlorine from the liquors used in the ammonia soda process, which has been worked out and put into use by Mr. Mond, of Messrs. Brunner, Mond & Co., an essential part of the process, and perhaps its most critical stage, is the heating of magnesium chloride in a current of air to obtain chlorine by the exchange of oxygen for that element. The difficulty of this operation largely consists in the fact that it must be conducted in a closed vessel at a fairly high temperature, so that the most obvious way of performing it is by the aid of heat applied externally to a tubular retort. For reasons that are patent to all acquainted with manufacturing operations of this description, the cost of heating in this manner must be high, especially when the life of the vessel in which the heating is conducted is taken into account. The substitution of a hot blast passing through the retort instead of firing it externally, simplifies matters in a considerable degree. The cost of the process is reduced, the limit to the dimensions of the vessel raised, and its life lengthened. The plan is now in use at Northwich, and should prove an important factor in the success of chlorine recovery from the waste liquors of the ammonia soda process. This particular application opens up a larger question altogether. Heating for industrial purposes is often effected by external firing when internal heating, by one means or another, would be more economical. The transmission of heat through a refractory envelope is attended by many drawbacks. Transmission by convection in place of conduction has as many advantages. One of the chief claims for consideration of the electric furnace, considered as a piece of plant, rests on the saving of energy and wear and tear by applying heat just where it is wanted, and a similar argument applies in the case of the hot-blast stove. It may be some time before boilers are commonly fired by the consumption of fuel in the interior and the troubles incident to the transmission of heat through tubes and plates done away with, but there are many other cases in which the internal production of heat, or its transmission in the form of hot gases to the material to be heated, might prove at least worthy of trial.

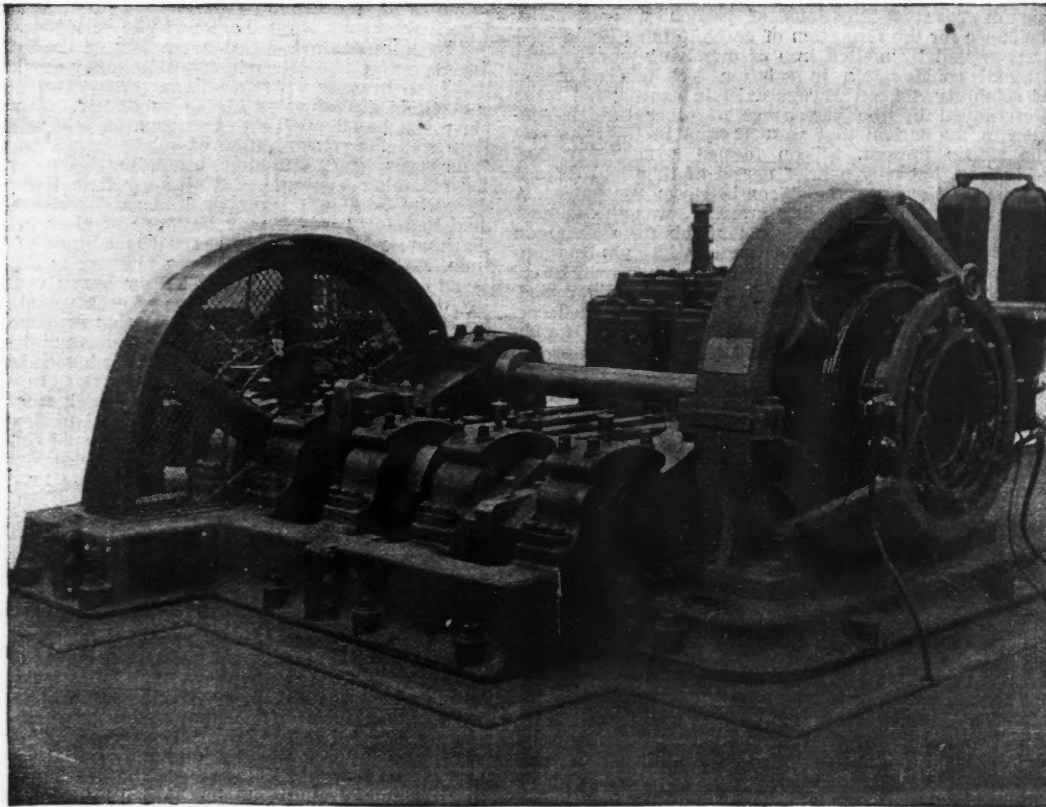
* Abstract of paper read at the September meeting of the Iron and Steel Institute of Great Britain.

† Abstracted from the "Australian Mining Standard."

* Abstract of article in the London "Engineer."

A LARGE ELECTRIC MINE PUMP.

The application of electricity to mine service, although one of the later departures in the field, was well shown at Chicago by the General Electric Company, which made a complete exhibit of mining electrical machinery. The largest and most striking piece of machinery in this exhibit was a single-reduction electric pump employed to furnish a head of water to the Peiton wheel in the ingenious demonstration of transmission of power by three-phase current. This pump, shown in the accompanying engraving, is triplex, double-acting, having outside packed plungers operated by means of crossheads and connecting rods from an extra heavy forged steel crank shaft. It was designed for mine work, and has a capacity of 500 gallons per minute against 650 ft. head. The plungers are of bronze, have a diameter of 5 $\frac{3}{8}$ ins., and are 18-in. stroke, and when operating at full capacity require 50 revolutions of the crank-shaft per minute, giving a plunger speed of 150 ft. The cylinders and valve chambers are made of composition metal, in order to resist the action of bad mine water. The pump is operated through a single set of gears by a General Electric Company's six-pole 75 kilowatt motor, making 275 revolutions per minute. This necessitates a reduction of only five to 1 at the gears. The design of the pump is, in many respects, novel. The arrangement of the armature shaft which is prolonged over the top of the pump, brings the motor to one side of the pump instead of in front as is usually the case. By this means a great saving in space is effected, and this is a matter of considerable importance when it is a question of installing pumps in the underground re-



A LARGE ELECTRIC MINE PUMP.

cesses of mines. Hitherto, pumps of this class have been constructed with two sets of gears, but in this pump one set is saved by the slow speed of the motor, and a proportionate gain in efficiency effected.

The pump throughout is solidly, substantially and heavily constructed, and may be run for long periods without cessation at its full rated capacity. An electric pump of similar capacity to this has been for some time past operating successfully in the Calumet & Hecla Company's mines, in Michigan.

New Zealand Coal.—It is stated that an English syndicate has purchased the Cobden Railway and Coal Company's property at Coal Creek, near Greymouth, New Zealand, with a view to developing the local coal seams. The property consists of 4,500 acres, and several seams of coal have been discovered, the largest being 15 ft. thick. The company will construct a railway to Greymouth, four miles from the field.

An Aluminum Launch.—M. Castelin & Camion, of Mezieres, France, have constructed an aluminum launch for a French expedition to Central Africa. It is made of plates 8 mm. to 10 mm. thick, is 33 ft. long, and 8 ft. beam, and weighs complete, with wooden fittings, 1,780 lbs. The same firm is constructing a number of aluminum vehicles for use in Africa, and proposes to introduce them also into the French possessions in Asia. We may also note here that a steam yacht now under construction at the Herreshoff yard at Bristol, R. I., is to have the deck and upper works of aluminum.

EDISONIAN MONEY.

A new solution of the silver question has been offered by Thomas A. Edison, the electrician. In an interview he said:

"The hankering after gold and silver is largely traditional. People allow themselves to be governed by the old ideas on the subject of coinage formulated at a time when national credits exist and currency would be only taken at an intrinsic value. What we need is a new standard of value. I think that the best dollar could be made out of compressed wheat. You take a bushel of wheat and squeeze the water out of it, and then compress it into a hard cake the size of a silver dollar and stamp the Government mark upon it.

"That would represent actual value and labor performed, and then you could eat a dollar, for when you wanted to use the wheat, all that would be necessary would be to put your money to soak. We should then have the bushel of wheat as a permanent unit of value, which all farmers would appreciate, and the currency of the country would represent actual worth and labor performed. Both gold and silver could then be dispensed with, and the present bimetallic problem solved. Our currency, moreover, would be as good as gold or silver in foreign exchanges, for our wheat goes to all the countries of the world.

"In all this talk about metal for coinage, I am surprised that no one has suggested iron. Iron is the most precious metal. Gold is of no use, or silver either. Mankind has no use for either gold or silver, but iron could not be dispensed with. If the people would only give up this foolish, traditional, hereditary hankering for gold and silver, these

metals would not be worth the price of old lead, and would be kicked aside by civilization.

"The human race, on the other hand, cannot dispense with iron. Iron must be produced to keep pace with consumption, or its price will steadily rise. The demand for iron is steady, and will never cease. Therefore, why not issue treasury certificates on iron? This is the greatest iron producing country in the world, and our output amounts annually to more than the output of both gold and silver. Instead of loading up the treasury with these useless metals, and, as people would want bills of large denomination to accompany the wheat dollar, why not buy iron or steel instead and issue treasury certificates upon that?"

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Court of Appeals of Kentucky.

Taxable Property in Mineral Estate in Land.

Since the mineral interest in land may be severed from the surface interest, by conveyance, thereby becoming separate real estate, it may be taxed as other real estate.—*Stuart vs. Commonwealth*, 23 S. W. Rep., 367.

Supreme Court of Montana.

Constructive Trusts.

Where a tenant in common has conveyed an undivided interest in a mining claim to his cotenants, and they have obtained a patent and afterward conveyed to a third person, who was not a bona-fide

purchaser, the latter's position is not superior to that of his grantors, and where they admit that they held the undivided interest in trust, for their cotenant, the trust will be declared, and a conveyance to him decreed.—Butte Hardware Co. vs. Schwab. (34 Pacific Rep., 24.)

Supreme Court of Washington,

Injuries to Employees by Negligence of Mine Inspector.

One appointed by a mining company, as required by law, to examine its mine daily for firedamp, with authority to forbid men from working in any part of the mine that may seem unsafe, is not a vice-principal, so as to make the company liable for his negligence in opening his lamp in the mine to light his pipe, and where such negligence causes a firedamp explosion, killing an employee, there can be no recovery for such death, when he was induced to open his lamp, by the statement of the deceased, who had been in that spot for several hours, that there was no firedamp there.—Morgan vs. Carbon Hill Coal Company. (34 Pac. Rep., 152.)

Spanish Steel Rails.—The steamer "Sombrero" recently sailed from Bilbao for Matanzas, Cuba, with a cargo of 2,100 tons of steel rails. This is the first shipment of the kind which has been made from Spanish rolling mills to the Spanish West Indies. It is the outcome of the decree of April, 1892, which granted special privileges to certain Spanish industries.

Volatility of Manganese.—R. Lorenz and F. Heusler have shown that while manganese does not form a volatile compound with carbon monoxide, it volatilizes and sublimes at a white heat in a current of either carbon monoxide, carbon dioxide, hydrogen or nitrogen. With carbon dioxide the metal brings about partial reduction; no indications of the formation of nitride of manganese are obtained with the nitrogen.

Gold Fields of Scotland.—It is probably not generally known that there are gold fields in Scotland. There are, however, some old workings known as the Kildonan gold fields, in the county of Sutherland, in the extreme north of Scotland. The County Council of this shire have recently approached the owner of the ground and asked him to allow the fields to be worked by the resident population for a fair surface rent.

Iron Minerals in France.—The imports of iron minerals into France in the first seven months of this year amounted to 854,614 tons, as compared with 928,204 tons in the corresponding period of 1892, and 724,182 tons in the corresponding period of 1891. In these totals Spanish iron ores figured for 216,853 tons, 256,086 tons, and 241,067 tons respectively; and German iron ores for 559,966 tons, 573,416 tons, and 433,111 tons respectively.

German Coal for Naval Use.—The German Navy Department has decided that all the coal required by the Imperial fleet during the years 1894 and 1895 is, with the exception of a few far-distant coaling stations, to be the best Rhenish-Westphalian coal. The preceding German contracts for coal supplies for the fleet were for English coal. The Dutch naval authorities have also for the first time decided to accept tenders for German coal.

Petrified Mushrooms.—The San Francisco "Chronicle" says that recently Mr. E. K. Stevenot, of Sonoma, Cal., noticed in the foothills near that town a peculiar formation, which on closer inspection proved to be nothing more nor less than a bed of petrified mushrooms. They were in a silicious cement, which easily yielded to a knife blade. Several of the specimens were in excellent preservation, though most of the larger ones were broken in the attempt to free them from the cement. There were also found in the same spot a number of petrifications that appear to have been nut galls.

French Industrial Prizes.—The Societe d'Encouragement pour l'Industrie Nationale has made the following awards: The grand medal for agriculture to Prof. E. Lecourteux; the prize of 3,000 francs for perfecting the ventilation of mines to M. Murgue; the prize of 2,000 francs for a study of the coefficients required in a calculation of the mechanical possibilities of an aerial machine has not been awarded, but a sum of 500 francs has been assigned to Professor Le Dantec. The prize of 2,000 francs for the inventor of new methods of utilizing petroleum, advantageously and without danger, for industrial and domestic purposes, has also not been awarded, but an encouragement in the shape of 1,000 francs has been given to Dr. Paquelin.

Petroleum for Boiler Incrustations.—The officials of the Prussian State railways have for several years been making use of petroleum in order to remove the incrustations in the boilers of locomotives and fixed machinery. These trials have been so satisfactory that petroleum is now used in every case where the incrustations are not too hard and impermeable. Petroleum is used after washing the boiler and after the compartments of the latter are completely dried; the petroleum is applied with the aid of brushes, or injected by means of a pump. On some occasions an attempt has been made to make use of petroleum before the water in the boiler has been removed. In this case, the "Journal" of the Society of Chemical Industry says, the petroleum spreads uniformly over the whole surface of the water, and when the latter is allowed to run out slowly the petroleum fixes itself regularly in the porous incrustations, which absorb it.

The Mont Blanc Observatory.—The observatory erected by M. Jansen at the summit of Mont Blanc is built entirely of wood, and is founded on the firm snow with which the top of the mountain is covered. It was originally intended to carry the foundations down to rock, but the excavation made showed the thickness of the

snow cap to be much greater than was expected, and the plan had to be abandoned. A small test structure was accordingly erected on the snow, and left on the mountain during the whole of last winter; it showed no signs of movement, and it was accordingly determined to proceed with the permanent structure. This resembles a truncated pyramid in form. Its base measures 33 ft. by 17 ft., and it contains two floors, as well as a flat roof, reached by a spiral staircase. The walls, doors and windows are made double, as a protection from cold, and the latter also provided with shutters on the outside, fitting tightly over the openings.

A Great German Bridge.—A commencement has been made with the construction of an important work which the "Annales Industrielles" describes as the greatest viaduct in Germany. It is situated on the Solingen-Remscheid railway, which has been laid out chiefly with the object of serving one of the most important of the mining centers of that country. The viaduct has a total length of 1,600 ft., and is built entirely of iron. Its center span consists of an elliptical arch 550 ft. between bearings, and 350 ft. above the level of the ground line. Iron piers founded upon enormous masses of masonry support the remaining spans, which are six in number. Over 4,000 tons of iron are used in the erection of the structure, and the masonry foundations amount to 150,000 cu. yds. Side arches are provided to allow of the roads which follow the contours of the valley passing underneath the viaduct. In order to place the central span in position, it will be necessary to erect a temporary staging nearly 100 ft. in height. The estimated cost of carrying out this work is \$625,000.

The Maritime Canal Company of Nicaragua.—Mr. Hiram Hitchcock, president of the Maritime Canal Company of Nicaragua, in his annual report to the Secretary of the Interior, just received, states that since the organization of the company, 10,145 shares of its capital stock have been subscribed for, amounting to \$1,014,500, of which \$1,006,940 has been paid into the treasury in cash; and \$48,871 has been realized from other sources, making the total cash received \$1,055,811. Since the organization of the company it has paid for property, work and labor done, and materials furnished in the execution of the work of constructing the canal, and in administration expenses, the sum of \$830,788 in cash, and 31,990 shares of the full-paid capital stock of the company, of the par value of \$3,199,000, and is obligated for \$6,855,000 of its first mortgage bonds. The company has also issued 180,000 shares of its capital stock, of the par value of \$18,000,000, in payment of concessionary rights, privileges, franchises and other property. The liabilities of the company consist of the amounts still due under the concessions granted to the company, of the \$6,855,000 bonds, and of cash liabilities outstanding to an amount not exceeding \$50,000. During the last year the Nicaragua Canal Construction Company suffered under the general depressed monetary conditions with others, and was obliged first to limit its expenditures and finally to suspend all payments. This resulted in the appointment of a receiver, when measures were at once taken to reorganize the company upon a strong financial basis, providing for the liquidation of its debts and the active prosecution of work, under its contract, in the immediate future. These measures are now well under way, and the Maritime Canal Company is awaiting the result.

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 NOVEMBER 4TH, 1893.

- 18,892 of 1892. Plant for Smelting Sulphides. F. O. Prince, London. (J. Dixon, F. J. Blades, W. S. Douglas and D. Garlick, Adelaide, South Australia.)
- 22,602 of 1892. Recovering Sulphate of Ammonia from Gas Liquor. R. Dempster, Manchester.
- 22,739 of 1892. Blasting Powder. H. Kolf, Bonn, Germany.
- 22,843 of 1892. Aluminum Vessels for Holding Food and Drink. W. R. Taylor, Rochester.
- 22,971 of 1892. Coal Screens. J. Ellis and C. McHardy, Aberdeen.
- 6,960 of 1893. Nitric Acid Manufacture. M. Prentice, Stowmarket.
- 8,902 of 1893. Manufacture of Nitric, Muriatic and other Acids, employing Sulphuric Acid and Superphosphate of Lime. M. Prentice, Stowmarket.
- 9,042 of 1893. Sulphurous Acid and Sulphites. M. Prentice, Stowmarket.
- 12,588 of 1893. Refining Iron and Steel. W. A. Koneman, C. G. Singer and A. F. Hatch, Chicago.
- 12,662 of 1893. Electrolysis of Salt. E. Andreoli, London.
- 17,102 of 1893. Miners' Lamps. H. Hempel, Berlin.
- 17,111 of 1893. Preparation of Aluminum Fluor-Sulphate. W. E. Case, Auburn, N. Y.

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, NOVEMBER 7TH, 1893.

- 507,981. Gas Generating Apparatus. William T. Eate, Conshohocken, Pa.
- 507,987, 507,988, 507,989, 507,990. Petroleum Engine. Oscar Bürunler, Eütritzsch-Leip-sic, Germany.
- 508,001. Gas Generator. Abner C. Erskine, Bowling Green, Ohio.
- 508,003. Downdraft Brick Kiln. William A. Eudaly, Cincinnati, Ohio.
- 508,008. Ore Grinder. Gustave A. Gellen, San Francisco, Cal.
- 508,012. Method of Welding. John M. Gull, Johnstown, Pa., Assignor, by mesne assignments, to the Johnson Company of Pennsylvania.
- 508,013. Furnace. Wardell Guthrie, Chicago, Ill.
- 508,021. Furnace. Henry B. A. Kelsner and Charles M. Schwab, Braddock, Pa.
- 508,029. Combination Metal Working Machine. John A. Lidback, Portland, Me.
- 508,071. Car Dumping Apparatus. Abram E. Williams, Nelsonville, O.
- 508,084. Diaphragm Used in Electrolytical Processes. August Breuer, Iserlohn, Germany.
- 508,136. Furnace for Kilns. William Hassall, of Ashby-de-la-Zouch, England.
- 508,150. Hydraulic Air Compressing Apparatus. Carl T. Schützinger, Hamburg, Germany.
- 508,159. Hydraulic Elevator. Charles H. M. Atkins, Bond Hill, O.
- 508,225. Air Compressor. John Knoche, Cincinnati, O.
- 508,230. Brick or Tile Machine. Julius E. Marquardt, Edgar, Wis.
- 508,241. Electrolytic Apparatus. James C. Richardson, London, England.
- 508,313. Rock Drill. William O. Higgins, Kingwood, Ind.
- 508,381. Smelting Furnace. Joseph L. Giroux, Jerome, Arizona.
- Reissue No. 11,379. Smelting Furnace. Albert Piat, Paris, France.

PERSONALS.

Mr. James Douglas, of New York, was in Butte, Mont., last week on business.

Mr. Louis Williams, superintendent of the Bisbee Smelter, in Arizona, has been visiting Butte, Mont.

Mr. H. P. James, mining engineer, of Philadelphia, has been making a mineral survey of Texada Island.

Mr. J. K. Clark, superintendent of the Molton mine, Montana, has returned to Butte from a visit to the East.

Mr. Eckley B. Cox has been nominated for a second term as president of the American Society of Mechanical Engineers.

Mr. Warner Miller has resigned as president of the Nicaragua Canal Construction Company, which went into the hands of a receiver lately.

Capt. John Daniells, superintendent of the Tamarack copper mine, in Michigan, has been visiting the copper mines and smelters of Butte, Mont.

Mr. Enoch Lewis has resigned his position with the Pennsylvania in consequence of advancing age. He has been 43 years with the company, and for 26 years past purchasing agent.

Mr. Reiji Kanda, recently connected with the Japanese mining exhibit at Chicago, is now visiting the mining school and mines, at Freiberg, in Germany. He expects to remain at Freiberg through the winter.

Mr. L. C. Trent, a director of the well known Fraser & Chalmers' corporation, and for 20 years the manager of its Western business, has resigned as manager, the resignation to take effect upon the appointment of his successor. Mr. Trent has not indicated as yet in which direction his energies will be devoted in the future, but we suppose that 20 years of experience, which has been successful, in the mining machinery business, will hardly allow him to change his business. We hear rumors that connect his name with one or two prominent concerns in the East, already, but Mr. Trent assures us that he will form no connection immediately.

OBITUARY.

W. J. B. Walker, superintendent of the Balbach Smelting and Refining Company, of Newark, N. J., died November 15th.

Ambrose Rutts, assistant chief engineer of the Butte & Boston Company, died at Butte, Mont., November 4th, of pneumonia.

Homer B. Sweet, who died at Syracuse, N. Y., November 16th, aged 67 years, was well known throughout the State as a civil engineer. He was for a number of years engaged in the survey of the Adirondacks and made the first reliable map of the North Woods.

John W. Chambers, who died in Brooklyn, N. Y., November 14th, aged 80 years, had been for over 60 years connected with the American Institute, in New York, and for 50 years past had been secretary of the board of managers. For many years he had charge of the yearly fairs at the Institute.

Anton F. Emrich, mining engineer and metallurgist, died at Pueblo, Colo., October 6th, in the 35th year of his age. Mr. Emrich's brief professional career was thoroughly creditable to him, and gave promise of a future distinction which the failure of his health alone defeated. He was born in 1859, at Melrose, Westchester County, N. Y., and after a complete preparatory education, entered the School of Mines, of Columbia College, whence he was graduated in 1882, with the degree of mining engineer. His first engagement was with the Tombstone Mining and Milling Company, of Arizona. Early in 1883, he entered the service of the Colorado Smelting Company, which owned not only the fine lead smelting works, at Pueblo, Colo., but also the Madonna mine, in Chaffee County, one of the largest producers of silver lead ores in the State. Mr. Emrich's versatility and fidelity found varied scope in this position. In the assay office and the chemical laboratory he was equally at home; and he conducted with skill the mine surveys and the preparation of the mine maps. After about a year he was permanently stationed at the Madonna mine as superintendent, and in that capacity exhibited conspicuous ability in the complicated and difficult work of exploration and exploitation incident to the maintenance of a large and regular production, from a very irregular deposit, in ground decidedly dangerous from the standpoint of the miner and timberman. No doubt it was the severe training of daily experience in this mine that made him so good a judge of the capacity and value of silver lead deposits and of the best methods of prospecting and working them. His ability in these respects was subsequently proved in the service of the Montana Smelting Company, an organization closely allied with the Colorado Smelting Company, but operating in Montana. For several years (beginning in 1887) Mr. Emrich was mining engineer and ore buyer for this company, and in the dis-

charge of his duties traveled widely, inspecting mines, new discoveries, etc., and sometimes directing mining operations. It was during this period that he made the reconnaissance through Idaho and up into the then half inaccessible Kootenai country, in British Columbia, the exposures and hardships of which were probably the cause of his loss of health. At least it may be said that he was never afterward so perfectly strong and "weather-proof" as he had been up to that time; and the severe illness which resulted from that journey left him with a weakness of the lungs which subsequently developed into the disease of which he died. He did not, however, abandon his professional activity at once, but on the contrary took charge in 1891 of the Montana Smelting Works, at Great Falls, which he conducted with success, realizing a profit for the company. At last, increasing weakness forced him to give up this labor, and about a year ago he went to Southern California, in the vain hope of recovering his health in that friendlier climate. Disappointed in this hope, he returned in June last to Pueblo, where he remained until his death. Mr. Emrich's characteristics were honesty, methodical and painstaking fidelity, modesty and "all-round" capacity. He will be mourned and missed by those who knew him, even superficially, much more by those who knew him well, and therefore esteemed and loved him.

R. W. R.

SOCIETIES AND TECHNICAL SCHOOLS.

Civil Engineers' Society of St. Paul.—At the regular meeting in St. Paul, Minn., November 6th, Maj. J. W. Howard delivered a lecture on "Asphalt: Its Chemistry, Sources and Uses." The substance of this address will form the part of the forthcoming report of Mr. F. J. V. Skiff, chief of the Department of Mines and Mining at the Columbian Exposition.

Society of Naval Architects & Marine Engineers.—The first general meeting was held in New York, beginning November 16th. On the morning of that day a business session was held and a number of interesting papers were presented. In the evening the yearly dinner of the Society was held at the Hotel Brunswick, a large number being present. The meeting concluded on November 17th.

Montana School of Mines.—A number of sites for the building of this school, at Butte, were offered to the commission charged with its construction. The decision was finally in favor of one in what is known as the Montrose addition to the city. It comprises 4½ acres of ground on the easterly slope of a long low ridge which extends southward from the big Butte. It is not probable that ground will be broken before spring.

Foundrymen's Association.—The second annual meeting was held in Philadelphia, November 1st, with a very large attendance. The treasurer reported receipts of \$849, and expenditures of \$610, leaving a balance of \$239. Several committees reported progress. The Committee on Cast Iron Pipe said that there has been a general break in prices and pipes were being sold and offered at prices below actual cost. The following officers were then elected for the coming year: President, Francis Schumann; vice-president, Thos. Devlin; treasurer, Josiah Thompson; secretary, Howard Evans; executive committee, Walter Wood, Thomas Glover, L. B. Whitney, H. C. Vansant and Stanley G. Flagg, Jr. President Schumann then delivered a brief annual address. The meeting closed with a brief discussion on the rate to be charged foundries in the Association for chemical determinations to be made at the University of Pennsylvania laboratory.

Anglo-American Club, Freiberg, Germany.—This club desires to announce that many communications have been received from old members requesting information as to the whereabouts of former friends and classmates in the Freiberg Bergakademie. It has, therefore, been considered advisable to make provision for corresponding memberships of the club, and in order to make this of practical utility, it is desirable for members to send notice of their present location and occupation, so that information can be given when requested. It is also intended that all such personal information, as well as any news of interest regarding the club or the Freiberg school, shall be incorporated in an annual or semi-annual report, which will be printed and a copy sent to each corresponding member. To meet expenses of printing and postage, the fee for corresponding membership has been fixed at 5 marks yearly. Communications from members or former members desiring to take advantage of this arrangement are requested.

Engineering Association of the South.—At the annual meeting in Nashville, Tenn., November 10th, the reports of the committees on Finance, Library and Printing, were presented. The report of the secretary and treasurer were also received. Communications from the German Engineers' Association of Chicago, and Austrian Society of Engineers and Architects, thanking the Association for its share in entertaining foreign engineers at the World's Fair were read. After discussing the finances, the Association elected the following officers for the coming year: President, Charles

Herman, Louisville; first vice-president, Wm. C. Smith, Nashville; second vice-president, J. Kruttschmit, Houston, Tex.; directors from Tennessee, Wm. W. Carson, Knoxville; Wm. L. Dudley, Nashville; E. C. Lewis, Nashville; director from Kentucky, John B. Atkinson, Earlinton; director from Georgia, Geo. H. Crafts, Atlanta; secretary, Hunter McDonald, Nashville; treasurer, Wm. T. Magruder, Nashville. The retiring president, Mr. E. C. Lewis, read the annual address, the subject of which was how to increase the interest in the Association and make it more useful. This was followed by a brief discussion.

Engineers' Club of Philadelphia.—At the regular meeting, November 4th, Mr. Wilfred Lewis showed a section of a 7-in. steel staybolt from a hydraulic riveter, which had broken in the nut. There was a general discussion on fractures of this kind, in which a number of members joined. Mr. Carl G. Barth spoke at some length on a number of cases of fracture in test specimens. Mr. John C. Trautwine, Jr., described the largest of four single-track stone bridges which are being thrown across the wild and narrow valley of the River Pruth, in Galicia. This is a segmental arch, varying in thickness from 7 to 10 ft., and having a clear span of 213 ft., with a rise of about 60 ft. It was cheaper, on account of the good material at hand, to make these bridges of stone than to have them built of iron, and the one described above is believed to be the largest stone railroad bridge and the largest stone arch in existence, excepting the Cabin John aqueduct bridge, near Washington. In constructing the arch, the lowest or innermost ring, to avoid excessive loading of the centers, was built first and allowed to remain for two or three weeks before the upper layers were added. These were begun at not less than four points as the springing points and the middle of each haunch simultaneously, and the closing of the ring took place simultaneously at not less than three points.

California State Mining Association.—The Committee on Exhibits at the Midwinter Fair met in San Francisco and organized. The following is the list of officers: President, J. J. Crawford; secretary, W. C. Ralston; executive committee, S. K. Thornton, S. B. Christy, Frank McLaughlin; advisory committee, R. McMurray, W. S. Chapman, Thomas Boyesen, Chas. G. Yale, W. W. Stow, N. Pichoir, John Daggett, J. A. Clark, John Ballard, Trey L. Ford, Niles Searles, A. J. Ralston, William Clift; finance committee, Edward Coleman, Geo. T. Marye, Felix Chappellet, Adolph Hirschman, Martin Jones, M. W. Belshaw, Chas. W. Randall, Samuel J. Hendy, Dan T. Cole, J. E. Doolittle, Geo. R. Wells, W. E. Deane. The committee has issued a circular notice from which we abstract the following: An adequate and proper display which shall represent all the varied branches of the mining industry will be of incalculable advantage. Probable investors, not only in our own communities, but from outside our borders, must be shown what we have to become interested. It rests with the mining men of this State to see their industry represented before the people in a suitable manner. The California mining display at Chicago was by no means equal to those of other less important mining sections of the country, but the judgment of the public is based upon what they see, and the miners of this State cannot afford to let this opportunity pass—the first one they have had on this coast—without making an earnest effort for a grand display, which shall show to the world how important and varied is the mining industry of California.

INDUSTRIAL NOTES.

The Stewart Furnace, at Sharon, Pa., has gone into blast again, after a short stoppage.

The Lehigh Zinc Works, at Bethlehem, Pa., started a block of fires November 15th.

R. D. Wood & Co., Philadelphia, have had their pipe foundries running steadily all through the summer.

The Cambria Iron Company, Johnstown, Pa., has put its Bessemer and blooming mills on double time.

The Columbiana Pump and Machine Works, at Columbiana, O., have started up, after a shutdown of a month.

The National Tube Works Company has recently placed in its works, at McKeesport, Pa., a 300-H. P. Adams water tube boiler.

The nail factory of the Pottstown (Pa.) Iron Company, which has been idle for six months, partly resumed November 13th.

The Whitaker Iron and Steel Works, at Wheeling, W. Va., were damaged by fire November 12th to the extent of about \$85,000.

Duquesne Forge, at Rankin, near Pittsburg, has been put in full operation. It was closed all summer, but started up partially several weeks ago.

The Bay State Furnace, at Fort Payne, Ala., was sold recently at public sale and was bought in for \$30,000 by Charles Turner, who represents the bondholders.

The factory of the Bridgeport Crucible Company, Bridgeport, Conn., was destroyed by fire, November 9th. The loss is estimated at \$40,000, which is nearly covered by insurance.

The property of the Unaka Iron Company, Unaka, Tenn., has been sold to the Ferguson Timber and Iron Company, which is putting the works in order and will start them up shortly.

The construction department of the Philadelphia Bridge Works, at Pottstown, Pa., has resumed operations on double turn, and the nail mill of the Pottstown Iron Company has started 20 machines.

The Emporium Steel Company has been organized at Emporium, Pa. The officers are: S. S. Smith, president; John D. Logan, treasurer; L. K. Huntington, secretary; R. L. Watters, superintendent.

The Stirling Company recently sold to the Providence Union railroad Stirling safety water tube boilers of 1,000 H. P., arranged in four units of 250 H. P. each, the order being given after severe competition.

The Automatic Wind Motor Company has nearly completed its plant at Bladell, N. Y., near Buffalo. The plant includes a machine shop 48x112 ft., a foundry 48x112 ft., a smith shop 48x32 ft., and several smaller buildings.

The Norristown Steel Company, Norristown, Pa., has been reorganized, with the following officers: President, H. H. Haines; vice-president, E. M. Daniels; treasurer, C. H. Higley; secretary, Joseph H. Hampton; general manager, George J. Humbert.

The Carpenter Steel Company, of Reading, Pa., which has furnished the government with \$750,000 worth of projectiles, has received another order for projectiles for coast defense purposes, which will keep the firm busy for two years. Over 400 hands are employed.

The wages of the puddlers in the Columbia Rolling Mill Company's mill, at Columbia, Pa., have been reduced from \$3.25 to \$3, to take effect November 20th. All of the other employees' wages will be reduced proportionately. This reduction affects over 300 men. These same men's wages were reduced in September from \$3.75 to \$3.25.

B. F. Hean, Jacob M. Shenk and John Meiley, of Lebanon, Pa., have completed the appraisal of the assigned estate of Robert H. Coleman, the Cornwall, Pa., iron manufacturer. The real estate is valued at \$3,448,948, and the personal property at \$702,178, making the total appraisal \$4,151,126. It does not include Mr. Coleman's interest in the Jacksonville, Tampa & Key West Railroad.

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 following is the text of the act to amend Section 2324 of the Revised Statutes of the United States, relating to assessment work on mining claims which was passed as noted last week by both the House and the Senate, and has now been signed by the President and become law. It will be observed that South Dakota is specially exempted from its operation: Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the provisions of section numbered 2324 of the United States, which requires that on each claim located after the 10th day of May, 1872, and until patent has been issued therefor, not less than \$100 worth of labor shall be performed or improvements made during each year, be suspended for the year 1893 so that no mining claim that has been regularly located and recorded, as required by the local laws and mining regulations, shall be subject to forfeiture for non-performance of the annual assessment for the year 1893; provided that the claimant or claimants of any mining location, in order to secure the benefits of this act shall cause to be recorded in the office where the location notice or certificate is filed on or before December 31st, 1893, a notice that he or they in good faith intend to hold and work said claim: provided, however, that the provisions of this act shall not apply to the State of South Dakota. This act shall take effect from and after its passage.

The report of the Bureau of Statistics, Treasury Department, gives the exports of mineral oils for October at 73,823,361 gallons; a decrease of 1,379,710 gallons, or 1.8% from October, 1892. For the 10 months to October 31st the exports were: Crude, 90,865,508; naphthas, 12,157,308; illuminat-

ing oils, 583,294,379; lubricating and paraffine, 28,396,008; residuum, 456,918; total, 714,970,121 gallons; an increase over the corresponding period last year of 115,556,891 gallons, or 19.3%. New York ranks first as a port of export; Philadelphia second and Baltimore third.

ALASKA.

Alaska-Treadwell Gold Mining Company.—The October report shows that 19,711 tons of ore were milled during the month, and 508 tons of sulphurets treated. The bullion shipment amounted to \$76,872, of which \$24,515 came from the sulphurets. The gross expenses for the month were \$23,926. The net profits available for dividends for the first five months of the present financial year amount to \$234,000.

Nuklakahyet.—Some development work is in progress on a gold mine at this place, according to the "Alaskan." The mine is owned by Mr. Bertels, agent of the Alaska Commercial Company. The gold is found in decomposed talc, markedly tinged by iron rust. A tunnel has been run for some distance. Water power is not available, and consequently if a mill should be erected upon the property, it must be operated with steam.

Yukon Placers.—About 250 miners, it is stated, will winter on the Yukon River this year. It is said that they received abundant supplies before the closing of the river.

ARIZONA.

Cochise County.

The Tombstone "Prospector" publishes the following items of Dos Cabezas mining news:

Chattman.—Mr. Billings and Mr. McDonald are taking out a fine lot of ore from the Chattman mine, about eight miles east of town. They expect to run it through the Cincinnati mill in a short time.

Ella.—D. Waughtal is running a lot of ore through his cannon-ball mill from the Ella mine.

Philadelphia.—D. Coleman and H. Fitch are taking out ore in this mine to run through the small mill.

Graham County.

Arizona Copper Company.—According to the Prescott "Courier" this company has its large leaching plant about ready for operation, and the manufacture of acid is now in progress. This new process promises much for Clifton and vicinity. The Detroit Copper Company will erect a similar plant at Morenci when success has been demonstrated by the Arizona company.

CALIFORNIA.

(From our Special Correspondent.)

The mining assessments falling delinquent during the present month aggregate \$18,000.

Alameda County.

(From our Special Correspondent.)

El Encino Consolidated Blue Gravel Mining Company.—This corporation filed papers of incorporation this week, with a capital stock of \$100,000, of which \$63,320 has been subscribed. The heaviest stockholders are J. S. White, A. M. Benham, W. R. Thomas, F. Chappellet, W. McDonald, J. W. Benham and E. C. Rigney.

Amador County.

Bay State Mining Company.—At the recent meeting of the directors of this company, it was resolved to abandon work at the 300-ft. level and commence sinking in the shaft. A bulkhead will be placed in the crosscut and it is hoped to hold the water at this level. There will be quite an item of saving to the company in doing away with the expense of the water used in running the hydraulic pump.

Calaveras County.

(From our Special Correspondent.)

Utica Mine, Angel's Camp.—The clean-up of the mine for October will pass the \$180,000 mark. The September product was \$165,000, and in August about \$145,000.

Mono County.

Bodie Consolidated Mining Company.—From its bullion product this company made \$209 above its expenses last month, and has \$10,000 in its treasury.

Dunderburg Consolidated Mining Company.—Assessment work on the old Dunderburg Consolidated mining claims, near Bridgeport, has been commenced in the south drift, where there is a show for the company to make a strike.

Nevada County.

Allison Ranch.—The Grass Valley "Union" reports the sale of the famous Allison Ranch mine by A. E. Davis to James D. Hague, the well known mining man and capitalist. The actual spot cash paid is said to have been \$60,000. Work ceased on the Allison Ranch about 17 years ago, when the mine had attained a vertical depth of about 400 ft., or in the neighborhood of 800 ft. on the incline. A "horse" was encountered and work shortly afterward ceased. Millions of dollars have been extracted from the mine and large dividends paid.

East Harmony.—The hoisting works of this mine, above Nevada City, were totally destroyed by fire last week.

San Francisco County.

(From our Special Correspondent.)

There were received during the month of October and the first 10 months of the year the following receipts of quicksilver:

	Oct.	10 mos.
1891	1,781	12,392
1892	2,170	17,148
1893	2,718	20,024

The shipments by sea for the 10 months of the year were: 1893, 11,825 flasks, value \$481,215; 1892, 6,748 flasks, value \$279,830. The shipments overland in the first nine months of the year were 9,344 flasks.

Siskiyou County.

According to the Yreka "Journal," the Klamath River miners, in the Honolulu district, still continue to take out considerable gold, the best time for successful operations being just when the river is low. The Pokegama dam has not troubled the miners at all this season, by having the gates in right style for allowing a steady flow of water, so that the wheels work steadily in operating the derricks, pumps and other apparatus.

Greenhorn.—This blue gravel mine continues to yield about 4 oz. a day, with a larger clean-up on Sundays, when all the riffles are cleaned, says the Yreka "Journal." The cool weather now permits a better supply of water to wash up the gravel raised from the shaft. About a dozen men are now employed working two shifts of 10 hours' each.

Tuolumne County.

App Mine.—In this mine, the Tuolumne "Independent" says, the old shaft that has remained idle for years is now cleaned out to the 700-ft. level. The vein is from 8 to 12 ft. wide, solid and compact. Free gold shows all through, which is being daily extracted.

Rawhide.—According to the local papers the mines in Columbia district are good producers, and considerable activity has been shown there of late. The late strike in the Rawhide mine is greater than was anticipated. The vein as cross-cut shows a width of 15 ft. and is rich.

COLORADO.

Boulder County.

Colorado Central Consolidated Mining Company.—At the annual meeting at the office in New York, November 9th, the following directors were elected: J. Bates, W. A. Castle, John K. Creevey, Charles Dana, G. W. Hall, Paul Lichtenstein, T. H. A. Tromp, Karl Meissner and George Brennecke.

Dolores County.

Rico Consolidated Mining and Smelting Company.—This company has been incorporated by Rico capitalists, with a paid-up capital of \$200,000. The following officers were elected: E. H. Hackett, president and general manager; A. B. Litchfield, secretary; E. G. Chesebro, treasurer, and W. C. Brace, manager of the smelting department. The directors of the company are E. H. Hackett, Henry Klingender, Lee S. Wood, G. B. Garrison, W. E. Burley, Geo. W. Chesebro and A. B. Litchfield. The object of the company is to operate the smelter, lease mining properties and buy ores. Several properties have been leased and it is the intention of the company to run the smelter on its own ores. Everything is now being made ready for commencing operations. Among the principal properties controlled by this company are the Uncle Ned group, the Cobbler and the Stevens. In all it has about 12 groups and individual properties. The company will employ about 200 men.

El Paso County.

Appropos of the reports of the large sums for which some of the Cripple Creek properties have been bonded but not sold, the Cripple Creek "Crusher" says: There has not been a cash sale made in this district, where the purchase price exceeded \$1,500, since the sale of the Deerhorn last spring.

Calumet Mining Company.—A special meeting of the directors of this company was held in Colorado Springs November 10th. Directors Fauerland, Brooks and Leddy presented their resignations, which were accepted, and in their stead were elected E. F. Crowell, F. E. Robinson and W. G. Doubleday. The directors held a meeting later at which President J. K. Miller refused to resign as the head of the board and a new president was not elected. Mr. Doubleday was made vice-president and Mr. Robinson, treasurer. The election of a secretary was deferred. The directors have made arrangements to raise \$3,000 to pay debts on the property and begin active shipments at once.

Fremont County.

Canon City Coal Company.—This company, operating at Rockvale, and whose mine has been idle since October 16th, waiting on September pay, paid its 450 miners November 10th. It is expected that the mine will resume next week.

Mine Inspector Reed has been among the miners of Fremont County lately inspecting the mines and organizing them into a union. He has held public meetings at Coal Creek and Rockvale.

Gilpin County.

Concrete.—The main shaft of this mine is now down 915 ft., and levels are being driven east and west at a depth of 900 ft. The 825, 675 and 600-ft. west levels are also being extended. The mill

dirt from the Concrete, says the "Register-Call," will be crushed at the Cashier mill, below Black Hawk, which is being rebuilt by Mr. L. S. Newell, Jr., of Denver.

German.—The superintendent of this mine, on Bellevue Mountain, informs the Central City "Register-Call" that connection has been made from the lower west level of the east shaft with the west shaft, which gives the latter a total depth of 270 ft. The German management now has a large block of ground opened up to backstop.

Mammoth Gold Mining Company.—The Mammoth lodes, Mammoth Side lode and the Waterbury and McAdams lodes, covering 7,200 ft. of linear patented property, situated in Central City, have been sold to a syndicate of Chicago men, the cash consideration being \$100,000, says the Central City "Register-Call." The Mammoth is the great mother gold fissure vein of Gilpin County, having been discovered in 1859. It has produced since that time \$500,000. The other veins forming the group can all be worked through one main shaft at a comparatively small cost. The purchasers have set aside in the treasury a sufficient sum of money to erect a shaft building, to inclose a powerful plant of new and improved hoisting machinery to enable them to sink 1,000 ft. or more and open up the ground for backstopping by means of a series of levels, at such intervals as may be deemed best and most economic. Centering into this great mother vein on the east are the Gregory, Bobtail, Fiske and other lodes of lesser note, while on the west are the California and others coursing through Quartz Hill. This vein, where it was intersected by the cross-cut driven north from the Bobtail vein some years ago, is fully 30 ft. wide, the crevice matter all being more or less mineralized. The incorporators of the company are Messrs. Edward W. Williams, Joseph D. Hubbard and Mason B. Carpenter. The company has a capital stock of \$175,000, in 1,750 shares of a par value of \$100 each, the stock being fully paid up and non-assessable.

Wyandotte Mining Company.—The superintendent of this company is drifting east at the depths of 550 and 650 ft., but has not yet uncovered any pay in large quantities.

Lake County.

R. O. North has sold to C. H. S. Whipple a one-half interest in each the Lalla Rookh, Kanoshia, Forest City, A. W. D., the Ellen, the La Plata Blanca, the Temptation, the Grace, and a one-fourth interest in each the Buffalo Girl and Ten Per Cent, all situated in Lake County.

Patents have been issued to C. H. S. Whipple, C. N. Priddy, Ed. Veltz and Anne C. Williams, on the Keystone, H. E. Limba and Abraham Lincoln lodes, in the California mining district.

(From our Special Correspondent.)

At Granite, the gold-producing section of Lake County, a large number of new properties have lately been started up and a number have been recorded. From the Grit mine shipments of gold ore are being made daily, while some new development work has been begun. The Sunshine is being successfully developed, and quite a large quantity of gold ore is being mined. The Belle of Granite, although not shipping, has promising indications. The strike made on the Solix Tiye still holds out and preparations are going forward for active work during the winter. On the Sachem a 40-ft. vein of porphyry is being developed. An 8-ft. vein of mineral is being developed along the entire 85-ft. tunnel on the Magneta property. The Hill, Robert George, Hammond and Bell City are all working.

A prominent mining man here is preparing to erect a gold mill on Fryer Hill, only a short distance from this city. The idea is to treat gold ore from Cripple Creek and also to handle some of the ores from Twin Lakes, Granite, Taylor Hill and upper California Gulch. The advantage of Leadville for such a mill is obvious. It is the center of a large gold district, there being within a radius of 20 miles many properties, which, with proper encouragement, would be able to produce gold ores.

Bi-Metallic.—This smelter is now running two stacks. This plant and the Elgin are the only two smelters now in operation.

IDAHO.

Ada County.

American Mining Company.—According to local papers negotiations are in progress for working the copper mines of this company, at Seven Devils. The main thing required is proper transportation facilities.

Alturas County.

Solace Mining Company.—This company is making arrangements to work through the winter with a small force. For some time past they have been engaged in running a cross-cut tunnel. This tunnel has struck the vein 1,300 ft. from its mouth at a depth of over 600 ft. from the surface, and about 300 ft. below the lowest working. The ore taken out from the tunnel runs high in silver. It will also be used to drain the workings of the mine.

Idaho County.

Little Slate Creek Placers.—The Grangeville "Free Press" says that during the present season representatives of a California syndicate have located some 30 claims on Little Slate and Miller creeks and the small tributary gulches. There is

an abundant supply of water, if the water rights are consolidated, and this the syndicate is now doing. At different times prospectors have obtained fair results from the top dirt, and it is believed that full explorations will give better results.

Kootenai County.

The mining situation in the Coeur d'Alenes, says the Wallace "Miner," shows no material change within the last few weeks. The Bunker Hill still runs the day shift only and very few men have been discharged. Most of the men who found they were not wanted have left town, and as none are coming in in search of employment, the place is very quiet.

Last Chance.—Only a small force is employed on this mine doing necessary development work.

Sierra Nevada.—Some 15 men are now employed in this mine doing development work only.

Stemwinder.—A small force is working on this mine, under lease, and is taking out some ore from the lower level.

Owyhee County.

De Lamar Mining Company.—The return for October shows 3,645 tons of ore crushed during the month. The receipts were, from bullion produced in the mill, \$80,805; ore shipped to smelters, \$8,000; miscellaneous, \$885; total, \$89,690. The total expenses for the month were \$41,405, leaving a profit of \$48,285 for the month.

MAINE.

Kennebec County.

East Pittston.—The quartz veins in this town, which have been worked at intervals in the past for gold but without much result, are now once more being worked by James L. Cummings, of Augusta, says the Bangor "Industrial Journal." Mr. Cummings has set up a five-stamp mill at the mine and is now running it steadily, but no results have been reported as yet.

Waldo County.

Penobscot Bay Granite Company.—This company has started up its works at Prospect, and will employ 80 stonecutters besides a large number of men getting out paving blocks. The company has a number of orders on hand, sufficient to keep the quarries busy for a time.

MICHIGAN.

Copper.

Atlantic Mining Company.—Several of the officers and directors of this company, under guidance of Superintendent Stanton, recently inspected the new mill site, near Salmon Trout River, says the Houghton "Mining Gazette." The company owns a large tract of land here controlling the mouth of the river and both banks for nearly a mile from the lake. The mill will be placed a short distance from the shore of Lake Superior, on a plateau, about 15 ft. above the water. The rock bins will extend back to the bluff, which rises steeply so that the rock cars coming from the mine can be run in over the bins on grade. Water for running the mill will be brought from the river which will be dammed at a point where it runs between high banks. The dam will be founded on the bedrock and will be about 60 ft. in height. The water supply will not only be sufficient to run the mill, but also an electric light plant. The mill will contain seven stamps on solid foundations. The work to be done during the winter will be building the dam and getting out timbers for the mill buildings. The railroad from the mine to this site has been completed. It is of standard gauge and runs through heavy timber which can be cut for fuel as required. The grade is not heavy and falls toward the lake, thus being in favor of the loaded cars.

Iron—Menominee Range.

Appleton Mine.—Three Italians were injured at this mine while at work under ground. Two were hurt by the fall of rock and the third by a blast.

West Vulcan.—The premature explosion of a blast in this mine on Thursday, last week, says the Norway "Current," killed one man, and seriously injured another.

MINNESOTA.

Duluth.

(From our Special Correspondent.)

Total iron ore shipments for last week were 42,345 tons from Duluth, and 20,079 tons from Two Harbors. The Mesaba sent 46,898 tons and the Vermilion 12,205. For the season to date the mines have shipped as follows: Chandler, 421,662; Minnesota, 353,710; Biwabik, 165,000; Oliver and Mountain Iron, 220,000 together; Commodore, 65,000; Franklin, 46,150; Duluth, 38,000; Canton, 24,121; Zenith, 12,838; Minnewas, 12,500; Cincinnati, 9,958; Hale, 3,474; Lowmoor, 1,600; total, 1,325,000 tons. About 150 cars remain to come off the Vermilion and an unknown quantity off the Mesaba, enough to make its total over 600,000 tons undoubtedly. Not over 780,000 tons will be the total for the Vermilion.

Iron—Mesaba Range.

(From our Special Correspondent.)

Four properties on the range are now under negotiation for sale; the Iron King, price asked, \$450,000; the Mesaba Chief, price asked, \$275,000; one of the Ronchelean finds, and the Swedish-American, price asked, \$50,000.

Caution.—This mine was unwatered Saturday and mining began this week. At A shaft a large stockpile ground is graded.

Ronchelean.—A drill has reached iron at a depth of 130 ft., about a mile south of the Canton, the ore formation bearing west by south.

Iron—Vermillion Range.

(From our Special Correspondent.)

Minnesota.—This mine will stockpile 250,000 tons before navigation opens. Pumps have been at work for a week and many parts of the property are in position to begin work. The wages scale will be the same as at the lower ranges—\$1.50 a day underground, and \$1 for surface work. When the Chandler, belonging to the same company, starts, it will be on the same schedule. The few stockpile men now at the Chandler are getting 75 cents a day.

St. Louis County.

(From our Special Correspondent.)

Contrary to all expectations the United States land agent who has just examined the gold district along Rainy Lake has recommended that the lands be withdrawn from entry under the general land laws, and that the mineral land laws be extended to Minnesota.

MISSOURI.

Ozark Onyx Company.—This company is now advertising for sale its onyx property. The value of this property is said to be considerable, but it has not been properly developed owing to the lack of means.

Jasper County.

(From our Special Correspondent.)

Joplin, Nov. 13.

Last Saturday evening closed the most prosperous week in this lead and zinc mining district since last July. On Monday morning the zinc ore market opened strong at \$18 per ton, and buyers were in the market for all they could get. The latter part of the week \$18.50 was paid for choice lots of ore. Lead ore remained at \$18 per thousand up to the latter part of the week and then dropped to \$17.75. The Empire Zinc Company made a shipment of three carloads of spelter during the week.

Following are the sales of ore from the different camps: Joplin mines, 1,852,690 lbs. of zinc ore and 408,580 lead, value \$23,982; Carterville mines, 2,618,250 lbs. of zinc ore and 398,390 lead, value \$30,135; Webb City mines, 831,510 lbs. of zinc ore and 168,130 lead, value \$9,664; Zincite mines, 41,850 lbs. of zinc ore and 16,650 lead, value \$654; Oronogo mines, 64,440 lbs. of lead, value \$1,095; Alba mines, 42,000 lbs. of zinc ore and 230 lead, value \$340; Galena (Kan.) mines, 960,920 lbs. of zinc ore and 120,000 lead, value \$9,780; Granby mines, 196,710 lbs. of zinc ore and 105,410 lead, value \$3,066; district's total value, \$78,716; Peoria (I. T.) mines, 47,200 lbs. of lead, value \$790; Aurora (Lawrence County) mines, 1,090,210 lbs. of zinc ore and 199,660 lead, value \$10,106; lead and zinc belt's total value, \$89,612.

The South Joplin Lead and Zinc Mining Company, who had their concentrating plant burned up, have had their insurance adjusted and will commence rebuilding at once. The zinc smelter recently burned up at Galena has proved to be a total wreck, and the loss will exceed \$75,000, and there is but little probability of its being rebuilt.

MONTANA.

Jefferson County.

Elkhorn Mining Company.—The October return shows that the mill worked 29 days and crushed 1,095 tons of ore. The receipts were, from bullion produced in the mill, \$29,015; from 202 tons of smelting ore sold, \$12,350; a total of \$41,365. The expenses, including \$3,000 on account of the new pumping engine, amounted to \$26,055, leaving a profit of \$15,310 for the month.

Lewis & Clarke County.

Bloody Dick Creek.—A large number of placer locations have been made covering ground on the upper part of the creek. These locations have been made for an English syndicate, which proposes working on an extensive scale next season.

Montana Mining Company, Limited.—The October report states that during the month 90 stamps were in operation and 5,568 tons of ore were milled, the total output being 1,580 oz. gold and 14,960 oz. silver, the estimated value of the same being \$41,100. Expenditures for the month were \$33,600 for working expenses on revenue account and \$8,366 for development and other expenses, making a total of \$41,966.

Ophir Gulch.—On the claim owned by J. B. Brusevits, a tunnel has been run 350 ft. and has just struck a vein carrying very good ore.

St. Louis Mining Company.—A number of the stockholders of this company were recently in Marysville looking over their property, and it is said discussing the best method of developing the same.

Park County.

Cokedale Coal Mines.—We recently noted the occurrence of fire in these mines. The company has been remarkably successful in subduing this fire, which threatened at first to be a very serious one. It was entirely drowned out in a short time, and since then the mine has been pumped out, the

burned timbers replaced, and coal is now being raised and shipped as before the fire.

(From an Occasional Correspondent.)

Red Lodge Placers.—In these placers, on the boundary between Montana and Wyoming, the prospects at present are considered fair, so far as work has been done. The gold is heavy and is easily saved. The placers cover so much land that much work and money will be required to prospect them fully.

Silver Bow County.

Butte & Boston Mining Company.—The annual meeting was held in Butte, November 4th, and the following trustees were elected: A. S. Bigelow, Stephen M. Crosby, Thomas Nelson, Charles Vau Brunt, Boston, Mass.; Joseph A. Coram, Lowell, Mass.; Leonard Lewisohn, New York; Alexander S. Meltman, Chicago; John F. Forbes, Charles H. Palmer, Butte.

Boston & Montana Mining Company.—This company reports a total production of 3,225,000 lbs. of copper for the month of October.

Montana Ore Purchasing Company.—This company, better known locally as the Heinze Smelter, reports a total production of 1,000,000 lbs. of copper for October. The company has thrown up the Gambetta and East Moscow mines, which it bonded recently. The Rarus and Glangary mines are now producing all the copper ore which the smelter can handle.

Royal Gold Mine.—The shaft and ore house on this mine were destroyed by fire recently. The fire was caused by the explosion of a can of tar which had been put upon the stove to soften.

Six O'Clock.—This claim, near Meaderville, has been steadily worked through the year. A tunnel has been driven in 500 ft., and according to the Butte "Inter-Mountain," a vein was recently struck which carries as far as opened an average of 15% copper, and about 30 oz. silver to the ton. The vein is struck about 120 ft. below the surface. The tunnel is to be extended 100 ft. farther.

(From our Special Correspondent.)

Anaconda Company.—A shaft is being sunk on the Deadman, a new property, recently acquired and located north of the Mount View. A good deal of interest is centered in this work, as it is being prosecuted on a part of the hill commonly supposed to be barren. This company has departed from its custom by turning over some of its idle property to leasers. The Auglo-Saxon and Orphan Boy have recently been started up in this way.

East Moscow.—The lease on this property, which lies between the Moscow on the west and the Poulin on the east, has been transferred to Mr. Savage. The claim is 100 ft. square and has an inclined shaft of about 325 ft. depth.

Montana Ore Purchasing Company.—The capacity of the converters, recently put in, is in excess of the rest of the plant and consequently, for some time to come, they will have to shut down occasionally to allow water to accumulate. There have been some recent experiments here in the direction of adding concentrates to the matte charged in the remelting cupola, with such success as to warrant further trial.

Poser.—Capt. Dick James and Pete Opie have thrown up their lease on this silver property. It is situated toward the eastern end of the Rainbow lead, and has always been remarked as containing a chute of copper ore.

Travona.—This silver mine has just been closed down. It is located to the southwest of the city and belongs to the system of silver leads, of which the Ancient, Star West, Vulcan and Shonbar are members. It belongs to W. A. Clark, and though one of the oldest locations in the camp, has only been systematically worked for the past two years.

NEVADA.

(From our Special Correspondent.)

The mining assessments falling delinquent during the current month in this State will aggregate \$85,000.

Elko County.

Following are copies of the latest weekly official letters from Tuscarora mines: Navajo.—The stopes above the 350-ft. level continue about the same. Belle Isle.—Intermediate cross-cut from No. 2 raise, 250-ft. level, extended 7 ft., no change. South intermediate east has been connected with raise from the level. The stopes are looking about the same.

Esmeralda County.

Mount Diablo Mining Company.—This company has declared a dividend of 30 cents per share, amounting to \$15,000, and payable November 8th. The last previous dividend was paid on July 23d, 1891, and was at the rate of 20 cents per share. The mine has been closed down for many months,

and the present dividend is declared out of a surplus fund.

Storey County—Comstock Lode.

Savage Mining Company.—The latest weekly official letter says: On the 1,100 level we are extracting fair-grade ore from the 12th up to the 21st floors. During the week we hoisted 302 cars of ore; shipped to the Nevada mill 262½ tons and milled 270 tons; car samples average \$28.18, battery samples average \$23.50. Bullion yield for the week, \$4,271.40. On the 1,050 level we have started an east prospecting drift and have resumed work in the face of the drift from the station on the 1,100 level.

(From our Special Correspondent.)

The following is the weekly tabulated statement of ore hoisted from Comstock mines, with the car sample and battery assay, bullion product, etc.:

Table with 7 columns: Mines, Ore H'st'd, Car Sample Assay, Ore M'd., Av. Batry Assay, Bullion for Week, Total. Rows include Hale & Norcross, Occidental, Potosi, and Savage.

1 Cars of ore. 2 An amount of ore assaying \$30 per ton extracted but tonnage not recorded. 3 During October mined 85 tons of ore and slimes which produced bullion valued, dry assay, at \$1,432.

Consolidated California & Virginia Mining Company.—No ore has been crushed during the past two weeks. During the month of October only 416 tons were milled, yielding in gold \$18.37 per ton, and in silver \$14.53. During the month of January and part of June the mill was closed down. The bullion yield for the calendar year to November 1st, is: Gold, \$178,938; silver, \$170,147; total, \$349,185. This compares with totals for the corresponding period in 1892 of \$816,998, and in 1891 of \$1,511,017.

NEW MEXICO.

Grant County.

American Turquoise Company.—The sheriff has received an attachment for \$3,000 against the American Turquoise Company, of New York, in favor of Alfred H. Smith & Co., on a note of the company dated May 2d, payable six months after date, to the order of Herbert A. Thomas, who delivered it to Alfred H. Smith & Co. in the regular course of business. It went to protest. At the company's office it was said that the claim would probably be adjusted in a few days. John R. Andrews is president, and James M. Allen, treasurer of the company.

NORTH CAROLINA.

Cabarrus County.

(From our Special Correspondent.)

Buffalo Mine.—At this mine recently, from a six-days' run of the five-stamp mill, 400 dwts. of gold were worked clean up.

Mecklenburg County.

Surface Hill Gold Mine.—The latest news received from this mine states that work was started in a cross-cut abandoned some time ago, and ore was found after drifting 2 ft. farther, seven tons yielding 13 oz. of gold. Exploration is to be continued, although parties familiar with the mine believe this to be simply a pocket; but this can only be determined by actual work.

(From our Special Correspondent.)

Pennsylvania & North Carolina Gold Mine.—This mine has been leased to E. W. Hovey, a well known mine operator of the State. He is equipping the mine with a 10-stamp mill built by the Mecklenburg Iron Works, at Charlotte.

Randolph County.

(From our Special Correspondent.)

Redding Mine.—This is a new prospect, near Cedar Falls, owned by Dr. Redding, of that place. Some good specimens have been taken out, and good placer ground has just been discovered adjoining the mine. But little work, however, has been done as yet.

Rowan County.

(From our Special Correspondent.)

Graf Mine.—At this mine a full set of hands is working day and night. A new Frue vanner has just been put up in the mill. The concentrates will be shipped to the smelter, at Thomasville.

Union County.

(From our Special Correspondent.)

Long Mine.—This old mine has been leased to Mr. Clark, formerly of Boston, but now of Charlotte, N. C. He has cleaned out the old shaft to a depth of 80 ft. and found some good ore which he proposes to work.

OREGON.

Baker County.

Phoenix Mine.—The lessees of this mine, at Robinsonville, have bought the five-stamp mill, now on the Evening Star property, and the mill will be removed to the Phoenix as soon as possible. Ore is now being taken out in considerable quantities and active work will be carried on.

PENNSYLVANIA.

Allegheny County.

Forest Oil Company.—This company's well, on the Boyd Farm, near Wilmerding, has reached a depth of 2,616 ft. without result.

Philadelphia Company.—This company has finished a well, near Mount Nebo, which is yielding gas in moderate quantities but steadily.

Anthracite Coal.

A press dispatch from Pottsville says that a meeting of the miners residing in that vicinity was held at Yorkville, November 13th, with a view to establishing a branch of the Miners' and Laborers' Amalgamated Association, at Pottsville. The meeting was addressed by State Organizer George Harris, and an organization was effected. This branch is likely to have a large membership, as the miners think that they can better further their interests in reference to enforcing the semi-monthly pay law by joining the Association.

As the result of an effort to cut their wages from \$1.10 to \$1 per day, 150 laborers employed by J. C. Hawdon & Co., on the coal stripping operations, at Jeanesville, struck November 13th. The entire force, numbering 350 in these strippings, is made up mostly of Italians, and if some agreement is not made this week, it is expected all will go out. In this event the greater part of the 1,500 men employed at the colliery will be affected and possibly thrown out of employment.

An explosion of gas occurred at the Laurel Hill Colliery, at Hazleton, November 13th, by which some miners were injured.

Two large boilers in Wentz & Co.'s Hazel Brook colliery blew up November 13th. The boiler house was destroyed and work at the colliery has been suspended.

Operations were resumed at the Neilson shaft, at Shamokin, November 13th, after being idle since the fatal fire in April last, at which 10 men were killed. The mine employs 800 men.

Delaware, Lackawanna & Western.—This company has issued an order for the starting of all the company's mines on full time. This will give work to 5,000 hands.

Philadelphia & Reading Coal and Iron Company.—This company expects to sink another 500-ft. slope at the bottom of its Brookside Colliery, No. 1, near Tower City.

Wyoming Coal Company.—The Henry E. and the Forty-Fort collieries of this company, near Wilkes-Barre, Pa., have been leased by Simpson & Watkins and will soon be run to their full capacity, giving employment to 500 men and boys.

Bituminous Coal.

At a general meeting of all the disaffected miners in the Broad Top region, held on the Sandy Run branch on the 10th inst., to take final action on the proposition of the operators for a reduction from 50 to 40 cents per ton for mining, it was decided by ballot, after a lengthy debate, to accept the reduction and declare the strike "off." This decision affected about 950 miners and mine workers.

A mass meeting of all the miners in Cambria County has been called to meet at Hastings, in January, to organize for the purpose of "securing a just weight in coal" which they produce.

The miners of the Clearfield and Beech Creek regions are excited over the issuing of a circular by the Bell, Lewis & Yates Coal Mining Company, advising their employees of a reduction of 10 cents a ton, to commence on November 16th.

Iron Ore.

A press dispatch from Lebanon announces the discovery of a large deposit of iron ore on the banks of the Hammer Creek, in South Lebanon township, 10 miles from Lebanon. The newly discovered deposit is about three miles east of the celebrated Cornwall hills, and the ore is said to closely resemble that taken from the Cornwall banks. It is said to assay over 50% of iron and is slightly magnetic.

Mercer County.

Pittsburg parties have leased 2,000 acres of land near Stoneboro, and are preparing to drill several wells, their intention being to test the ground thoroughly for oil and gas. Shallow wells have been tried in this district without success, but it is believed that deep drilling will have better results.

Washington County.

Monongahela Natural Gas Company.—It is said that the Swagler well No. 1, which was completed for this company a few weeks since, in Somerset township, is the largest gas well in the world. The gas started in the fifth sand at a depth of 2,700 ft., and much difficulty was experienced in controlling the flow.

SOUTH CAROLINA.

The phosphate industry, especially river mining, is still in a very unsettled state, and the resumption of work is still uncertain. The receipts from State royalties for the fiscal year ending October 31st were \$233,533, an increase of \$65,615 over the preceding year. This increase was all in the earlier part of the year, the receipts for the month of October having fallen to a very low point. Only one

of the river mining companies, it is said, has so far accepted the proposition of the State board as to payment of royalty.

SOUTH DAKOTA.

Lawrence County.

Comet.—The shaft started recently on the newly discovered shoot of ore is now down 8 ft. and still in pay rock. From indications, it is thought the shoot is about 11 ft. thick. No work has yet been done to demonstrate its width. A sample lot of the ore has been sent to the D. & D. smelter for a test as to its value. In appearance it is identical with the Alpha shoot on the opposite side of the gulch, which, says the Deadwood "Times," runs from \$60 to \$90 gold per ton by the chlorination process. The steam pump lately put in the Comet is working easily and handles all the water.

Yankee Boy Mining Company.—A meeting of the stockholders of this company was held in Deadwood last week and the following officers and directors elected for the ensuing year: J. F. McLaughlin, president; John Murray, vice-president; W. A. Gray, superintendent; John Baggaley, secretary and treasurer, and W. H. Bonham as the other director. Eighty-five thousand shares of the capital stock were ordered issued in payment of the Yankee Boy and Yankee Boy Nos. 1, 2 and 3 claims, leaving 165,000 shares of treasury stock to be sold for cash and exchanged for labor and supplies, says the "Pioneer." The president, vice-president and superintendent were authorized to enter into contracts for labor and supplies to be paid in treasury stock. The president reported having already contracted for sinking a shaft to the quartzite or to the depth of 70 ft.

TEXAS.

El Paso County.

El Paso Onyx and Marble Company.—This company has been organized to work marble deposits near El Paso. The main office is in Chicago, and the incorporators are A. J. Auber, S. H. Shoenwald and C. Puscher.

UTAH.

Juab County.

Bullion-Beck & Champion Mining Company.—The force of miners at this company's property has been increased to 92 men. It is expected that more men will be employed next week.

Fish Springs Mining Company.—The mining suit of this company vs. Charles Crismon et al., is being tried before Judge Smith, of the First District Court. The plaintiffs claim that the defendants have been trespassing on the Carbonate mine and demand \$50,000 damages. Defendants deny this and are attempting to prove the ore belonged to the Galena mine.

Salt Lake City.

The receipts of ore and bullion in Salt Lake City for the week ending November 8th, were to the aggregate value of \$140,754, of which \$99,479 was in bullion, and \$41,275 was in ore. For the previous week the receipts were \$139,238, of which \$89,659 was in bullion, and \$49,579 was in ore. The receipts of Mingo bullion during the week were \$34,029; Hanauer bullion, \$17,250; base bullion, \$31,300; Daly bullion, \$10,900; gold bars, \$6,000. Ore receipts during the week were \$22,175 by McCornick & Co., and \$19,100 by T. R. Jones & Co.

Shipments from Salt Lake City for the week ending November 4th, inclusive, amounted to 1,013,658 lbs. of bullion; 33,434 lbs. of sulphides, and 2,057,620 lbs. of silver and lead ores.

Tooele County.

Mercur Mining Company.—This company has declared the second dividend of \$25,000, the first having been given out September 1st. Secretary Scannell, of the company, last week stated to the Salt Lake City "Tribune" that the company expected hereafter to declare a regular \$25,000 bi-monthly dividend. The Mercur and Marion gold properties in the Camp Floyd district, which are owned by this company, are yielding \$26,000 monthly, and the company has a large working surplus fund. Mr. Scannell says that about 100 men are now employed, and since the new machinery was put in in the early part of the year the property is making a great run.

VIRGINIA.

Goochland County.

(From an Occasional Correspondent.)

Gilmer Gold Mining Company.—This company has now everything ready and in shape for working by the cyanide process, and expects soon to begin operations.

Slate Hill Mine.—This mine and the adjoining Luce mine have just been sold for \$20,000 to Western parties. A new process, of which extraordinary things are predicted, is to be tried here. The maker of the process is kept secret for the present.

WEST VIRGINIA.

Coal.

The miners of the Kanawha district, after holding several meetings, have decided to ask an advance of half a cent a bushel. The alternative is a general strike.

WYOMING.

Crook County.

Sun Dance.—A force of men is now at work on this mine, and a number of claims have been located in the neighborhood. On one claim, located by F. Mulheisen and others, a tunnel has been run in 190 ft., and a shaft sunk 65 ft. at the end of the tunnel. It is claimed that average assays show \$8.50 per ton in gold. East of this A. A. Rounds and others have a claim on which a tunnel has been run 200 ft. with assays running from \$2.50 up in gold.

Nigger Hill.—New placer ground has recently been located in the neighborhood of the old placers at this place. The great ditch for carrying water from Cold Springs to Nigger Hill for hydraulic mining is making progress and will be completed next season.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

(From our Special Correspondent.)

Fisher Maiden.—This group on Four Mile Creek has been bonded to Joseph McKnight, of Seattle, Washn., and will be worked all winter.

Forty-Nine Creek.—On this creek, seven miles west of Nelson, Kirk & Ritchie have taken up some old placer ground and are making preparations to work on a large scale in the spring.

Kootenay Hydraulic Mining Company.—This company has closed operations for the season, but expects to commence again early in the spring. The company has expended over \$100,000 on its placer mining property on the Pend d'Oreille River and will employ from 140 to 150 men when work is begun.

Rico.—The owners of this mine are making preparations to work all winter and expect to take out and ship a large quantity of ore.

Slocan District.—The following statement shows shipments of ore made from the Slocan mines from August 7th up to the end of October. The figures are taken from the customs declarations: Wellington mine, 100,136 lbs., valued at \$9,527; Bon Ton, 9,000 lbs., \$1,000; Blue Bird, 140,173 lbs., \$8,143; Ainsworth No. 1, 66,000 lbs., \$3,300; Dardanelles, 83,636 lbs., \$15,280; Idaho, 123,517 lbs., \$17,362; Mountain Chief, 190,151 lbs., \$13,621; Freddy Lee, 98,000 lbs., \$7,644; Noble Five, 211,626 lbs., \$14,313; Washington, 80,000 lbs., \$5,524; Miner Boy, 7,448 lbs., \$551; Northern Belle, 330 lbs., \$30. This includes only those claims which ship their ore by way of Kaslo. The Vancouver, the Mountain Boomer and some other shipments are not in the list. It is thought here to be a good showing for so new a district.

Shipments of ore from the Slocan District continue to be made, notwithstanding that heavy snow has fallen. From October 21st to November 1st shipments were 143 tons from six mines.

The Gold Eagle Mine, Alberni.—Telegraphic dispatches have been received at San Francisco telling of the bonding of the above mine for \$50,000 and a contract made for 600 ft. of tunneling.

Texada Island.

A geological survey of the northern end of this island is being made by H. P. James, of Philadelphia, for some New York capitalists.

Nutcracker.—Mr. W. Fowler has taken an option on this claim for one year and is to commence active development work within 60 days from November 1st.

CHILE.

Santa Elena Nitrate Company.—At the general meeting in London, October 30th, the chairman stated that, in consequence of the action of the Chilean Government and of other forces brought to bear, it would be impossible to continue the nitrate combination which had existed for some time, and the prospect was that there would be considerable competition, especially upon the part of the smaller producers. The Santa Elena Company during the year ending June 30th last had experienced some difficulty from a scarcity of labor, but had produced 234,000 quintals, an increase of 25,000 quintals over the preceding year. A reduction in rates of railroad freight to the coast had been obtained, and the company was able to pay a dividend of 7½% on the stock for the year.

ECUADOR.

Cachavi Mining Company.—This company has dispatched an expedition to make an examination of its placer property in Ecuador. The party is in charge of Mr. T. W. M. Draper as engineer, and his principal assistants are John J. Robertson and Oscar Saahye, both engineers of standing. The party sailed from New York November 10th.

GREAT BRITAIN.

Early in the week Premier Gladstone addressed letters to the Coal Mine Owners' Association and the Miners' Federation suggesting a joint conference under the chairmanship of a member of the government for the settlement of the disputes which are exercising so had an effect on business. The proposition was accepted by both parties, and delegates appointed who met in London, November 16th, Lord Rosebery, Foreign Minister, presiding.

Scotland.

On the afternoon of November 16th fire started in the pit of the Summerlie-Kirkwood coal mine, near

Coatbridge. The superstructure and hoisting works were destroyed and the ventilating plant stopped. There were 52 miners underground at the time and it was at first feared that they had suffocated, but a later dispatch says they were all rescued.

INDIA.

Balaghat-Mysore Gold Mining Company.—The October statement shows 627 oz. of gold produced from 420 tons crushed. For the ten months to October 31st, the rock crushed was 4,836 tons, and the output 6,181 oz. of gold, against 5,469 oz. for the same period last year.

Champion Reef Gold Mining Company.—The report for October shows 2,060 tons rock crushed, producing 2,967 oz. gold. For the 10 months to October 31st there were 17,925 tons worked, yielding 25,495 oz. gold.

Oregonum Gold Mining Company.—In October there were 3,373 tons of rock crushed, the output being 5,633 oz. gold from the rock and 921 oz. from the tailings, or 6,554 oz. in all. For the ten months to October 31st, from 31,213 tons rock the total output was 61,953 oz. gold; an increase of 18,850 oz., or 43.7%, over the corresponding period last year.

MEXICO.

Durango.

Mexican National Iron and Steel Company.—This company has been organized at Des Moines, Ia., with \$3,000,000 capital stock. It is said that Richard Hovey and other English and American parties with large capital are interested. The new company will take the property of the Durango Iron and Steel Company. It will have offices in the City of Mexico and Durango.

Puebla.

Zacatlan.—A company is being organized in England to work the deposits of iron ore at Zacatlan, and to build a railroad from that point southward to a connection with the Mexican railway near Apizaco.

San Luis Potosi.

Guadalcázar Quicksilver Mining Company.—At the annual meeting in London, October 31st, an improvement in the condition of the company was reported. A considerable reduction in expenses had been made, and the ore capital stock had been written off, leaving the company with a clean balance sheet. A new furnace was under construction at the mines, and a new steam engine and pan directed. The ore produced from the mines during the year amounted to 3,383 tons, with an assay value of 3.52%. The development work led in March to a rich find of ore in the Santa Ana mine from which ore was still being drawn. As the ore shutes at present worked were leading toward the boundary of the property, an additional tract 800 meters long and 400 meters wide has been denounced. The company has also acquired a title to a group of silver mines including the Dolores, the Socovan and Las Cufjas, which are believed to be valuable, but will require considerable development work done upon them, opening old shafts and pumping out the water which has accumulated. A dividend at the rate of 10% was declared on the preference shares.

ONTARIO.

Black Jack Mining Company.—Mr. P. Sample has recently been examining this company's property.

Regina Gold Mine.—Messrs. J. Hennessy, Paul Proulx and John McLean are opening up a new mine on White Fish Bay, says the Rat Portage "Record." They have named it the Regina. The vein is about 5 ft. wide and carries gold. They have put on a force of miners who are at work developing the property. Supplies and building material have been sent out to the location for the purpose of carrying on the work.

SOUTH AFRICA.

Diamonds.

New Discovery.—A new diamond mine has been discovered in the Jagersfontein district. It is about 15 miles from the Jagersfontein mine on the Bloemfontein road, and was discovered by a farmer living in the neighborhood. The property has been examined by Mr. W. S. Lockhart, an expert, and an option taken on it for £30,000.

New Jagersfontein Mining and Exploration Company.—This company reports a yield of 19,976 carats for the month of September, from 37,173 lodges of blue ground. The estimated expenses were £15,393.

St. Augustine Mine.—At the meeting of the shareholders in London, November 1st, reports were received from the mine showing that explorations had been so far unsuccessful. An option had been taken on the adjoining property, but nothing definite could be said concerning its value. After some discussion it was resolved to wind up the company and to appoint liquidators to settle its affairs.

Transvaal.

Robinson Gold Mining Company.—The stockholders of this company have voted to purchase what are known as the Deep Level claims, formerly owned by the Robinson Deep Level Gold Mining Syndicate. These claims cover a considerable tract on to which the borings prove that the main reef of the Witwatersrand will pass at a depth estimated at 375 ft. The claims adjoin those now worked by the Robinson company. Examinations have been made of the new property by borings and driftings. They will be worked in connection with the main shaft of the Robinson.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 17. Statement of shipments of anthracite coal (approximated) for week ending November 11th, 1893, compared with the corresponding period last year:

Table with 4 columns: Region, 1893 Tons, 1892 Tons, Difference. Rows include Wyoming region, Lehigh region, Schuylkill region, and Totals.

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending November 11th and year from January 1st:

Table with 4 columns: Location, 1893 Week, 1893 Year, 1892 Year. Rows include Shipped East and North, Phila. & Erie R. R., Cumberland, Md., etc.

* Week ending Nov. 7.

Table with 4 columns: Location, 1893 Week, 1893 Year, 1892 Year. Rows include Shipped West, Pittsburg, Pa., Westmoreland, Pa., Monongahela, Pa., etc.

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending November 11th, 1893, and year from January 1st, in tons of 2,000 lbs.:

Week, 41,827 tons; year 3,504,773 tons; to corresponding date in 1892, 4,679,188 tons.

Anthracite.

Generally speaking no special features of interest have developed in the anthracite coal trade since our last weekly report. The conditions ruling to-day are practically what they were at that time.

Orders to stop work two days this week have been sent to the collieries not only by the companies, but by the independent operators as well.

There have been numerous "deals," accomplished as well intended, between coal-carrying railroads and other roads, affording new outlets for coal, etc.

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

Table with 5 columns: Coal type, Broken, Egg, Stove, Chestnut. Rows include Hard white ash, Free white ash, Shamokin, etc.

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 11th, was 295,000 tons, of which 35,000 tons were sent to Port Richmond and 30,000 tons were sent to New York waters.

The Bureau of Anthracite Coal Statistics makes the following statement of shipments for October and the 10 months ending October 31st:

Table with 5 columns: Region, Oct. 1893, Oct. 1892, Ten months 1893, Ten months 1892. Rows include Wyoming region, Lehigh region, Schuylkill region, and Totals.

For October the shipments show an increase of 472,706 tons, or 11.7%, pretty evenly divided between the three regions. For the ten months the Wyoming and Lehigh show considerable gains and the Schuylkill region a decrease; the total increase was 1,220,115 tons, or 3.5%.

The stock of coal on hand at tidewater shipping points October 31st was 725,566 tons; September 30th it was 798,019 tons, showing a decrease of 70,453 tons during October.

NOTES OF THE WEEK.

It is announced that an agreement for interchange of traffic between the Lehigh Valley Railroad and the new extension of the New York, Susquehanna & Western at Wilkes-Barre has been made.

There has been much newspaper talk of an agreement between the New York & New England and the New York, Susquehanna & Western for the exchange of traffic, especially of coal.

Bituminous.

The soft coal trade continues in the dull condition reported in our last week's review of the market. It seems that activity comes to it by fits and starts, and it is experiencing a mild one just now.

There is, comparatively, more business doing at the upper shipping ports than at the lower. This comes from the Sound trade, which has transferred itself from the lower to the upper ports since the freight rates advanced at the former to such an extent as to make shipments the other way more advantageous to consignees.

On account of the lack of profit in the soft coal trade operators have been looking in every way to reduce first costs of production, and we note that the bituminous coal operators in the Huntington & Broad Top region have reduced the price of mining coal from 50c. to 40c. per ton, dating from November 1st.

The meeting of soft coal producers, to which we alluded in our last report, took place in Philadelphia on last Tuesday. It is reported that there was a very fair attendance of the operators, who constituted the members of the old Seaboard Steam Coal Association.

Transportation has been poorer this week than for some time past. The car supply has been quite fair. The vessel supply has been poor, but the higher rates having driven orders away, the result is a slight weakness in the freight market.

Ocean freights are quoted as follows: From Philadelphia, Boston and Salem, \$1; Portland, \$1@ \$1.05; Providence, New Bedford, New Haven and Bridgeport, 90c.; Wareham, \$1; Lynn, \$1@ \$1.25; Newburyport, \$1.15; Portsmouth, \$1.05; ice ports, \$1.25@ \$1.50, when vessels can be obtained.

The Chesapeake & Ohio Canal had a bad break which, if ice makes at all in the next week, will probably close the canal up. Vessels at Georgetown, the end of the canal, are very scarce and little trade has been done from that port.

All-rail trade for the week has been very good. Prices remain unchanged.

Boston. Nov. 16.

(From our Special Correspondent.)

The anthracite coal market continues to be exceedingly quiet. No one seems desirous of making purchases, the yards preferring to go with a small stock to piling up coal. It must be remembered that business in general is very quiet and even consumers are purchasing very sparingly.

With the existing condition of manufactures nothing can be expected but a very dull soft coal trade. Even those mills that are operating have not bought much since vessel rates were advanced.

In a retail way trade is of but moderate proportions. To-day was rather cold, and in fact the only cold day we have had for some time, hence there has been a little spurt which will last only as long as this sort of weather continues.

Coal, owing to the general improvement in the iron trade, is in better demand. There has been a steady gain in orders from foundries, and the prospects more flattering for increased consumption.

Buffalo. Nov. 16.

(From our Special Correspondent.)

The anthracite coal trade continues quiet, although the change from Indian summer temperature to cold, with a heavy snowstorm yesterday, will indicate that fuel will be necessary from now to the advent of spring in 1894.

Lake freighting of coal is nearly over for the season of navigation of 1893, and shippers are hurrying their final cargoes to Western points of accumulation and distribution.

The prices of anthracite and bituminous coal are unchanged, the latter steady, with good assortment of the usual varieties supplied to this market.

Bituminous coal is fairly active for vessels, tug and manufacturers' use. The close of navigation in a few days will cut off the demand for vessel use until next spring.

The shipments of coal westward by lake from Buffalo from November 6th to 12th, both days inclusive, aggregate 109,390 net tons, distributed as follows: 47,365 tons to Chicago, 20,700 to Milwaukee, 7,150 to Duluth, 4,900 to Superior, 750 to Sheboygan, 1,800 to Menominee, 1,800 to Gladstone, 50 to Pentanguishene, 500 to Green Bay, 700 to Detroit, 750 to Manitowoc, 2,725 to Racine, 200 to Alpena and about 20,000 tons by Tonawanda vessels to various ports not specified.

Yesterday but few vessels left this port in consequence of the high wind and rough sea. During the night a hard frost has prevailed and continues this forenoon. A general snowstorm, accompanied by extreme cold with high wind, prevailed over Lakes Superior, Huron, Michigan, Erie and Ontario Tuesday and yesterday, and several disasters occurred, but it is too early yet to enumerate them truthfully.

Chicago. Nov. 15.

(From our Special Correspondent.)

The effects of the new deal now being consummated in New York are already being felt in this market. Not that the circular, as yet, is being more closely adhered to, but there is a firmer feeling among the various representatives of the producing companies.

There has been no improvement in the condition of trade in anthracite during the past week. The continued mild weather has left stocks here in practically the same condition as our last report. All rail coal is coming forward very slowly, and yet prices are perceptibly no stronger than they have been, and we doubt if outside of single carload orders any shipper in Chicago is attempting to get the circular price, in fact, we know that orders for as few as three cars have been accepted at \$5.85, even by middlemen.

To-day the weather is much colder and if it increases and continues it will unquestionably impart considerable impetus to the anthracite trade, which at this writing is about as dull as it can well be without being stagnant.

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, while seen rather quiet for the season, is steadily gaining, though circular is still being shaded. The closing of the World's Fair and consequent withdrawal of many passenger trains and the light westbound freight traffic have caused a heavy falling off in consumption of soft coal for locomotive use.

Coke, owing to the general improvement in the iron trade, is in better demand. There has been a steady gain in orders from foundries, and the prospects more flattering for increased consumption.

Pittsburg. Nov. 16.

(From our Special Correspondent.)

Coal.—The market may be said to be at a standstill; in fact, the business for some time past has been scarcely worth mentioning. There is very little mining going on along the Monongahela Valley. The

pools are all crowded with loaded boats and barges and no empties to give employment to the miners, making the outlook for this winter very discouraging.

Connellsville Coke.—Orders have been given to fire up ovens that have been idle many months. The probabilities are that with brighter prospects for the iron trade the coke trade will improve. The Frick Coke Company have fired up 150 ovens at Leisenring, No. 1; 200 at Leith and 200 at Leisenring No. 2. The McClure Coke Company have fired up Lemont No. 1, which has been idle during the last six months; other idle plants of the region are likely to be put in blast within a few days. There are 5,950 active and 11,500 idle ovens with a production of 55,250 tons, being an increase in production of 2,600 tons. The shipments for the week aggregated 2,980 cars, distributed as follows: To Pittsburg, 1,400 cars; to points east, 630 cars; to points west, 900 cars. Pittsburg increased 100 cars, East decreased 120 cars, West increased 150 cars. The following is the price of coke as furnished by the manufacturers. Reports current say the prices are shaded. 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 Pittsburg.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Nov. 17, 1893.
Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Nov. 18, 1892.	Nov. 17, 1893.	Jan., '92	Jan., '93.	Tons.	Tons.
Anthracite	71	31,016	35	16,410	1,527,050	1,282,561
Coke	136	131,495	59	60,507	6,092,599	4,991,134
Charcoal	44	9,703	25	3,170	171,152	353,906
Totals	251	172,156	119	82,117	8,093,701	6,632,601

Pig Iron.—There is a marked absence of new features in the pig iron market.

All conditions remain unchanged, and the trade is neither better nor worse than it has been of late. In this vicinity dealers report that there has been but a very slight improvement in the demand, and that prices do not show any signs of greater firmness. Consumers are still buying only enough to meet their most urgent requirements, and as business among foundrymen is improving quite slowly, the consumption of pig iron increases in proportion. Many of the orders for pig which have been credited to "new business" are only deliveries on orders which were placed some time ago, but which the buyers was unable to take before this. The tidewater 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 tidewater. Scotch irons are quoted: Coltness, \$21.50@22; Eglington, \$19.50@20; Summerlee, \$21.50@22.

Billets and Rods.—Business in billets and rods has been dull and uninteresting. Prices are practically unchanged and show no tendency toward an advance. Quotations, which are still shaded, are nominally as follows: Domestic billets, \$18@20; foreign billets \$28@29, tidewater. Wire rods, domestic, \$28@29; foreign, \$30@34, tidewater.

Manufacture of Iron and Steel.—Some small sales of manufactured iron and steel have been made during the week, but on the whole the market continues as quiet as ever and prices are without change of importance, and we quote this week: Angles, 1.75@1.9c.; axles, scrap, 1.80@2.1 delivered; steel, 1.75@2c.; bars, 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.—There is nothing new to report of this market, which continues quiet. Quotations are unchanged 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.—We do not hear of any business worthy of mention in this market. Quotations are nominally as follows: Old iron rails \$13@14; old steel rails, \$8@10; wrought scrap, \$9@10.

Rail Fastenings.—This market continues very dull and featureless. 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 of interest to report of this market. It continues exceedingly quiet. Quotations are nominally as follows: 10 to 12% Spiegel, \$22@22.50; 20% \$25@25.50. Ferro, \$50@55.

Steel Rails.—There have been numerous, almost numberless, rumors about the low prices for steel

rails which are said to have been named by some of the mills, both Eastern and Western. Reports from Pittsburg state that even less than \$21 would be accepted there, and Chicago advices are to the effect that the Illinois Steel Company has reduced its price "to unprecedentedly low figures." It is impossible to quote steel rails to-day. It is difficult to say what the mills would accept, but it is certain that good orders are easily placed at \$22 at the mill and a good purchaser who should offer \$21 would not be shown the door without getting an opportunity to discuss the matter.

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, 5 7/8, 10 and 5%; butt, galvanized, 50, 10 and 5%; lap, black, 6 7/8, 10 and 5%; lap, galvanized, 5 7/8, 10 and 5%.

NOTES OF THE WEEK.

The second national convention for 1893 of the Amalgamated Association of Iron and Steel Workers was begun at Pittsburg, Pa., November 16th, 125 delegates being present. There was talk of compromising the differences between employers and employed on the basis of \$4.25 per ton for puddling.

The Cambria Iron Company, of Johnston, Pa., has called a special meeting of stockholders to be held January 16th, 1894, to vote for or against increasing the capital stock of the company from \$5,000,000 to \$10,000,000, also for or against a proposed increase of the mortgage indebtedness to the amount of \$2,500,000. It is reported that the object is to place the company under the new Pennsylvania Constitution, and that, while authority will thus be obtained to get increased capital by either increasing the stock or bonds, there is no present intention of a change, the authority being sought for future needs, and the method being left to the stockholders to determine, whether capital shall be obtained by issuing more shares of stock or through a mortgage loan.

Buffalo, Nov. 16.

(Special Report of Rogers, Brown & Co.)

We note indications of improvement in demand for pig iron, but it is slight, and all transactions are on the low level of prices which has now been existing so long. A feature of the local situation is the resumption of blast of the Niagara furnace at Tonawanda, which has been banked for 70 days. Shipments of charcoal iron are going forward rapidly as the close of navigation approaches, but few new sales of it are being made. Our quotations below represent the market f. o. b. 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. 15.

(From our Special Correspondent.)

The most important event of any of the past week has been the sudden drop in the price of steel rails as reported from the Eastern markets. The price of \$29, so long adhered to by mills east of here, has at last been broken and the competition for rail orders appears to be as hot as on any finished product of iron or steel. The price of steel rails up to the past week has had the effect of deterring railroads from buying except for pressing needs, as the small tonnage used during the past year proves. The new figures may act as an incentive.

Pig Iron shows more life not only in inquiry but also in actual demand. Sales of local coke iron have been more frequent and for larger amounts—200 to 400 tons, and in several instances the individual tonnage placed under contract has been more. Buyers manifest a better disposition to buy for future requirements, as heretofore they have been afraid to fill up even for known future needs. The whole trade has been waiting improvement in general business conditions. A gradual gain may now be expected from week to week. The supply in consumers' hands is low as proved by the shipments, which were 25% more during October than September; this also indicates increased consumption. Southern coke iron though very quiet is in better inquiry. Lake Superior charcoal iron is also moving a little more freely and the situation is more favorable than for a long time. Quotations per gross ton f. o. b. 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 silveries 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, \$13.25@13.75.

Structural Iron and Steel continue in moderate demand, and new business includes several specifications for railroad bridges to replace wooden structures. Alterations to old buildings here will require a fair tonnage of beams, etc. Quotations, car lots, f. o. b. Chicago, are as follows: Angles, \$1.70@1.80; tees, \$1.95@2.05; universal plates, \$1.70@1.80; sheared plates, 75c.@1.85; beams and channels, \$1.75@1.85.

Plates.—Mill business has improved during the past few days, and a fair tonnage was placed yesterday for tank steel at very low prices—less than soft steel bars. Warehouse trade is only moderate. Steel sheets, 10 to 14, \$2.25@2.35; iron sheets, 10 to 14, \$2.20@2.30; tank steel, \$1.80@2; shell iron or steel, \$2.50@2.75; firebox steel, \$1.25@1.55; flange steel, \$2.74@3; boiler rivets, \$4@4.15; boiler tubes, all sizes, 65%.

Merchant Steel.—Steel makers' agents report a steady demand from the carriage and wagon trade, with good round contracts still pending. The low price of billets and steel bars is of material aid to manufacturers. 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.—Carload orders continue fairly active from manufacturing consumers. Warehouse trade would be better if supplies from mill could be depended upon. Discounts are firmer at 70, 10 and 7 1/2% off on Juniata and 70, 10 and 10% off on charcoal, and jobbing quantities at 70 and 7 1/2% off on the former and 70 and 10% off on the latter.

Black Sheet Iron.—Some mill business is reported for sheets lighter than No. 27 at about 2.70c. for 1bat gauge. Jobbers quote 2.95@3c. for same gauge for iron, and steel sheets are about 10c. higher per 100 lbs.

Bar Iron.—There is not much heavy business offering, orders being largely confined to 100 or 200 ton lots for well scattered deliveries. Local mills quote 1.40@1.42c. according to specification, and some car iron has been entered at 1.45c. Jobbing demand is fair from store at 1.60@1.70c. in less than carloads.

Billets.—Considerable inquiry has arisen for billets for delivery through January. Very fair quantities have also been booked for delivery in December for 4 x 4 billets at \$19.25@19.50. No prospect of starting up the Joliet rod mill, as there is so little business in sight. Rods are nominal at \$27.

Steel Rails.—There is practically no quotation made by the Chicago rail makers, though accepting the Pittsburg price of \$22 mill as correct, \$25 would be the figures here. The small orders coming in are filled from stock.

Nails.—Wire nails are in fair demand from mill at \$1.30 here. Jobbers quote \$1.40@1.45 from stock. Steel cut are quoted at \$1.29 in carloads, and \$1.35 from jobbers.

Scrap is in better inquiry, but ruling prices are still very low. Road, \$11.00; No. 1 forge, \$10; 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.—Iron rails are in fair inquiry and a few lots have changed hands at \$14. Steel rails are quiet at \$10@12.25 as to length and condition. Car wheels are neglected and nominal at \$12@13.

Philadelphia, Nov. 17.

(From our Special Correspondent.)

Pig Iron.—There is no pressure to sell, because makers and brokers are expecting a reviving demand which they say will help prices. Neither founders nor mill men are anxious to buy beyond orders in hand. Stocks are low, but buyers feel the enormous producing capacity will protect them against any advance. Best No. 1 founder is \$14.25; best No. 2, \$13.25, and best forge, \$12.50. These prices are in some cases shaded 50 cents.

Muck Bars.—The average selling price for small lots is \$22.25.

Steel Billets.—Billets have dropped again and \$19.50 would be taken quickly. Buyers do not care to buy for after December delivery.

Merchant Iron.—Bars are 1.50 to 1.60. Orders irregular and for small amounts. A great many users of merchant iron have secured promises from mill owners to not charge over certain named prices provided the orders are placed and filled this year.

Nails.—Mill competition assumed an aggravated form this week when prices were driven to 90c. Several manufacturers are determined to unload at any price, it seems.

Skelp Iron.—Orders for skelp were placed this week at 1.45.

Sheet Iron.—Small orders are being taken at shadings from card rates. Mills are not running full.

Merchant Steel.—The merchant steel makers are pleased with the business for the week because of the variety of steel ordered. The prospects are better but prices are cut.

Plate and Tank.—Small orders showed a marked improvement, but large orders are out of the question. Tank steel has been bought here under 1.50 and heavy plates at 1.50 for special purposes. Mill owners are not very hopeful of large enterprises being hastened forward. Shell is 1.70 and flange 1.80@1.90. People are inclined to put off buying as long as possible.

Structural Material.—There is not much new this week and manufacturers repeat former statements. Big work is under cover however, and as soon as tariff duties are fixed some of it will be started, at least this is the talk in the offices.

Steel Rails.—There is quite a scramble for new business among steel rail makers and prices have not been settled yet. It is said that \$23.50 to \$24.50 is about the selling price at eastern mills as soon as the scare occasioned by the sudden reduction is over.

Old Rails.—As low as \$13 delivered has been offered.

Scrap.—Market dull. No. 1, \$12; machinery, \$10.50; turnings, \$9.50.

Pittsburg.

Nov. 16.

(From our Special Correspondent.)

Raw Iron and Steel.—Trade continues to move along steadily, presenting but few changes. The market is certainly a waiting one; there are evidently movements going on that will be developed in the near future. While the general features of the market, for both finished and crude iron and steel, show no important change from the conditions which have so long characterized the trade, indications are not wanting of a better feeling on the part of producers in regard to the future. The demand is still restricted to lots for current requirements, and prices continue low and uncertain and favorable to buyers; but the easier feeling in monetary circles, the possibilities of more active buying of steel rails with the decline in the quotation, and the increased rate of production of pig iron, accompanied with a decline in the stocks on hand, are regarded by manufacturers generally as possible factors in influencing trade for the better. In the market for billets and pig iron there are more inquiries with a slight increase in the demand, particularly for limited amounts for immediate delivery. Consumers are bare of stocks of all kinds, but are, nevertheless, not disposed to place any large orders even at the present low prices. The idea undoubtedly is to carry as little stock as possible during the present year, so as to have an even start with 1894; up to this time we have only learned of one sale for next year's delivery. The Amalgamated Association is busy at work on a new iron and steel scale, which is expected to meet the views of manufacturers. At the request of the Association, the mills in the Mahoning and Shenango valleys have deferred starting until November 20th, at which time they will either sign the scale or start non-union.

There is a fair number of orders for small lots of finished forms of iron and steel, and some prospects of bigger work, but the outlook for a heavy demand is not very promising. Prices are low and unsatisfactory, and depend upon the character of the order and the terms of payment.

Suit has been begun at Columbus, O., to foreclose mortgages securing \$5,000,000 bonds issued by the Consolidated Wellston Coal and Iron Company, of Ohio. No interest has been paid since April, 1888. The property mortgaged was transferred by the company to Francis Hinkley, of Chicago, under an agreement by which he was to provide for interest and principal of the bonds, but which he failed to carry out.

Steel Rails.—There is no fixed value at present; holders are asking \$22 f. o. b. at the mill. With steel billets selling at \$17.50@18, the difference between steel rails and billets ought not to be more than 50 to 75 cents a ton.

Coke Smelted Lake and Native Ore.	500 Billets, prompt, at mill, Nov. 17.60
Tons, Bessemer, Nov., Dec., at mill, \$11.50	350 Billets, Nov., at mill, 17.80
2,000 Bessemer, Nov., Dec., 11.00	
1,000 Bessemer, Nov., Dec., 11.15	
1,000 Bessemer, Nov., Dec., 11.15	
1,000 Bessemer, prompt, 11.25	
1,000 Bessemer, Dec., 11.50	
800 Bessemer, Nov., Dec., 11.15	
750 Bessemer, Nov., Dec., 11.30	
500 Bessemer, Nov., Dec., 11.50	
1,000 Mill, 10.50	
1,000 Gray Forge, Nov., Dec., 10.50	
750 Gray Forge, 10.50	
500 Mill, 10.50	
500 Gray Forge, Dec., 10.75	
500 Mill, 10.50	
300 Mill, 10.50	
200 No. 1 Foundry, 13.00	
200 No. 2 Foundry, 12.00	
200 No. 2 Foundry, 12.25	
50 No. 1 Silvery Extra, 15.50	
50 No. 2 Silvery, 13.00	
50 No. 2 Foundry, 12.00	
50 No. 1 Foundry, 13.00	
Blooms, Billets and Slabs.	
2,000 Billets and slabs, Nov., Dec., at mill, 17.80	
1,500 Billets, Nov., Dec., at mill, 17.75	
1,000 Billets, Nov., Dec., at mill, 18.10	
1,000 Billets, Nov., Dec., at mill, 18.00	
800 Billets and slabs, Nov., Dec., at mill, 17.80	
750 Billets, Nov., Dec., at mill, 17.70	
500 Billets, Nov., Dec., at mill, 17.50	

METAL MARKET.

NEW YORK, Friday Evening, Nov. 17, 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 \$.
11	4'84	32 1/2	69 1/4	.559	15	4'84 1/2	32 1/2	69	.553
13	4'84	32 1/4	69 1/4	.557	16	4'84 1/2	32 1/2	69 1/4	.555
14	4'84 1/2	32 1/4	69 1/4	.555	17	4'84 1/2	32 1/2	70	.541

The demand for silver has been moderate, but sufficient to absorb current supplies. China has been the principal buyer, and considerable business has been done in placing forward silver, although at prices below the rate for spot. Shipments this week will be very large.

The United States assay office at New York reports the total receipts of silver for the week to be 198,000 ounces.

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

Week	Gold.		Silver.		Excess of Ex. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1893...	\$91,507	\$2,596,143	\$475,581	\$17,618	\$2,046,673
1892...	70,251,054	61,170,538	27,144,719	3,080,969	\$33,141,246
1892...	59,211,433	7,737,128	18,503,160	2,837,531	\$67,139,954

The gold exported for the week went to the West Indies; the silver to London. The gold imported was from London and South America; the silver from South America. The gold shipments from London were noted last week. The imports for the week exceeded the exports for the first time in several months.

During the five days ending November 16th the exports and imports of gold and silver have been as follows: Exports, gold, \$31,000; silver, \$478,520; total, \$509,520. Imports, gold, \$1,924,518; silver, \$20,079; total, \$1,944,597. Of the silver exported, \$14,250 was in Mexican bullion and all the rest was in American bullion and coin; all the silver exported went to London; all the gold exported was in American bullion and coin and went to the West Indies. Of the gold imported, \$1,545,839 was for deposit in the United States assay office and was paid for by check upon the sub-treasury at New York, November 17th, \$17,412 American silver in transit to Paris and \$28,500 Mexican silver in transit to Germany passed through the New York Custom House. There were deposits made of \$500,000 at the sub-treasury for payments at other points.

NOTES OF THE WEEK.

The imports of gold reported this week include most of the gold taken last week in London for the United States. No further purchases are reported, and at present rates of exchange it would hardly be profitable to import. London papers continue to anticipate large calls for gold in the future, but do not expect them to come immediately.

Some large exports of silver are reported. The German steamer "Lahn" sailing from New York on Tuesday, 14th, carried 435,000 oz. in all, two firms shipping 150,000 oz. each, one 100,000 oz. and one 35,000 oz.

Now that the silver purchase law is out of the way, discussion of the currency is in order, and the first point which attracts attention is the lack of elasticity in the national bank circulation. How to establish a system under which that circulation shall be safe and yet able to expand quickly to meet requirements is a problem already discussed by Mr. Hepburn, formerly Comptroller of the Currency, in a recent article, which will doubtless call out other writers. His plan is an abolition of the present system of bond security, and the imposition of a tax on circulation by which to establish a guarantee fund; it has been suggested before, and will probably find advocates.

Last week's statement of the New York banks showed increases of \$5,518,275 in surplus reserve; \$602,700 in loans; \$1,528,400 in specie; \$6,368,700 in legal tenders; \$8,327,300 in deposits; and a decrease of \$53,600 in circulation. Loans increased very little in spite of the continued accumulation of deposits. The reserves are now \$57,828,725 in excess of the 25% required by law.

The statement of the United States Treasury on Thursday, November 16th, showed balances in excess of outstanding certificates amounting to \$95,565,538. Of this there was in gold \$85,490,891; silver, \$6,340,074; legal tenders, \$2,090,525; treasury notes, etc., \$1,643,148. The total balance showed a decrease of \$1,711,525 as compared with the previous week; the gold balance an increase of \$1,146,960. On the same date silver dollars and bullion on hand under the act of 1890 amounted to \$153,559,112. The treasury notes in circulation and in the treasury amounted to \$153,168,590.

The increase in the gold balance is due to the payment of a larger proportion than usual of duties in gold, and to some transfers from the banks, which have been holding an unusually large amount of gold, as shown by last week's statement.

The government revenue last week, for the first time in several months, exceeded that of the corresponding week last year, the figures being \$5,630,648 for 1893 and \$5,185,237 for 1892. The increase was in payments on internal revenue.

The net exports of gold from London for the week ending November 16th were £220,000, shipments having been £150,000 to Egypt and £270,000 to Germany and Holland, while receipts were £100,000 from Africa, £90,000 from Brazil and £10,000 from Portugal. The Bank of England reports its holdings of gold on the 16th at £23,525,102, an increase of £860,600 over the corresponding date last year.

The Bank of France reports for the week ending Nov. 16, an increase of 2,000,000fr. gold and 837,000fr. silver. The bank's specie holdings were on the 16th, in sterling, £68,134,793, and £50,505,604 silver, an increase of £1,035,948 gold, but a decrease of £980,380 silver, as compared with the corresponding date last year.

England has been much disturbed over rumors of trouble in the Bank of England, which resulted finally in the removal of the cashier, who had held office for many years. So far as made public, however, it appears that there has been no defalcation, but only a questionable use of discretion in accepting collateral for loans.

The repeal of the Sherman law had much less effect on the price of silver in London than many people expected. This was partly due to the fact that the final passage of the repeal bill had been generally expected and its effects discounted and sales for future delivery had been made for nearly our full output, and partly to the support given to the market by the demand for China which has been very large.

Messrs. Pixley & Abell, of London, report the exports of silver from London for the first 10 months of this and of last year as follows:

	10 months, 1893.	10 months, 1892.
To India.....	£5,928,851	£5,684,299
" China.....	1,523,516	112,429
" Straits.....	1,213,613	3,242,292
Total.....	£8,665,980	£9,139,020

It is evident that China has been the great market for silver this year, and is still taking it, and is thus helping the silver market. India increased somewhat its purchases, but is now taking less, but the Straits Settlements have greatly reduced their purchases.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars.....	\$.50 1/2	\$.51 1/2
Peruvian soles and Chilean pesos.....	.52	.54
Victoria sovereigns.....	4.85	4.88
Twenty francs.....	3.87	3.90
Twenty marks.....	4.71	4.78
Spanish 25 pesetas.....	4.78	4.80

Other Metals.

Copper.—There is decidedly a better inquiry for material for consumption at home, and it is reported that the Calumet & Hecla Company have made quite a sale, of a quantity and at a price not made public. It is surmised that the consideration was 10c. per lb., at which figure a few others have also sold. The lake copper now available for shipment before close of water navigation season is becoming very limited. Electrolytic copper, on the other hand, is in ample supply and to be had at from 9 1/2% to 10%, while casting copper is to be quoted 9 1/2%@9 3/4%. A great deal, if not everything, now depends on what the demand from home consumers will be, which, if at all better, will somewhat stiffen values.

Abroad the consumption is evidently very good, as, in spite of last month's deliveries exceeding 20,000 tons, statistics for the first half of the month show a decrease of 200 tons in available supplies. G. M. B's have been inclined to dullness, and close somewhat easier at \$42.5s. for spot and \$42 1/2s. 6d. for three months, prompt. Refined and manufactured we quote, as follows: tough, \$45@45 1/2s.; best tel. \$45 1/2s.@46; strong sheets, \$52@53 1/2s.; India sheets, \$50 10s.@50 15s.; yellow metal, 4 1/2d.

The following figures give the production in tons of 2,240 lbs. of copper in the United States, and also by the chief foreign mines, and the exports from the United States for October and the 10 months ending October 31st:

	Oct.	Ten mos.
Reporting mines in the United States.....	11,503	108,517
Pyrites and outside sources, United States.....	1,012	10,616
Reporting foreign mines.....	7,081	67,589

Total production, long tons.....	19,626	186,752
Exports from United States, fine copper.....	11,473	64,273

The exports, though still large, showed a considerable decrease in October from the preceding month, when they reached the high figure of 16,131 tons. The exports this year have been 54% of the total United States production.

The exports of copper from the port of New York during the week ending November 17th were as follows:

	Bars	40 tons
Hamburg—Amalfi.....	Ingots	100 "
London—America.....	"	21 "
Glasgow—Devonia.....	"	"

regime. This being so, there is a long season of activity ahead but the game will remain the same—the insiders will have the money and the street be loaded up with stocks. At the same time it is to be remembered that others of the Comstocks besides the bonanza mine are in good shape for exploiting and their individual merits are being brought under the public notice.

Sir Thomas Hesketh, who has been in the city with F. Newlands engaged in matters pertaining to the Sharon estate, in which he is directly interested, is now in Virginia City. Much curiosity is being shown with respect to the south end mines controlled by the estate. These stocks have had a very heavy tone for a long time but to-day there was a strong advance along the line of Gold Hill stocks; and although this may, to some extent, have been in general sympathy with the north enders, it is believed and hoped that a new departure has been decided upon by the Sharon heirs—or those having their interests in charge.

One week ago Consolidated California & Virginia sold for \$3.20 and this morning opened at \$4.90. During the various sessions of the board it advanced to \$5.50 and closed at \$5.62½ bid and \$5.75 asked. The advances in others of the Comstocks have been even more striking. To-day Ophir sold to \$2.70, an advance of \$1 on the week's trading; Sierra Nevada at \$2.10; Mexican at \$1.70; and Union Consolidated at \$1.55; all sold steady and closed strong.

In the middle group of Comstock sales were not so heavy as at the north end, but trading has been fairly heavy during the past two days. Best & Belcher sold in the afternoon session to-day for \$3.35; Chollar for \$1; Gould & Curry for \$1.70; Hale & Norcross for \$1.20; Potosi for \$1.35; and Savage for \$1.30.

Yellow Jacket has received the greatest attention of the Gold Hill stocks. A week ago it sold for 70c. and to-day sold fully for \$1.85, closing strong at a 5c. advance. Alpha sold for 35c.; Alta for 30c.; Beecher for \$1.40; Bullion for 60c.; Caledonia for 20c.; Consolidated New York, 20c.; Confidence, \$2.50; Imperial, 10c.; Crown Point, \$1.45; Exchequer, 20c.; Justice, 35c.; Kentuck, 30c.; Occidental, 50c., and Overman, 60c.

The upward tendency of the market has been so pronounced that a slump may be anticipated before long. Bed rock prices will not be reached, but a decline from present ruling rates is looked for.

During the month of October the stock market began to show renewed activity after a prolonged spell of stagnation. The following statement of monthly sales illustrate the fluctuations in the market during the current year:

Table with 3 columns: Month, 1892, 1893. Rows include January, February, March, April, May, June, July, August, September, October, and Total.

During the same period of time in 1891 the total number of shares sold was 4,659,665.

SAN FRANCISCO, Nov. 17 (By Telegraph).—The opening quotations to-day are as follows: Best & Belcher, \$2.45; Bodie, 20c.; Belle Isle, 15c.; Bulwer, 10c.; Chollar, 70c.; Consolidated California & Virginia, \$3.75; Gould & Curry, \$1.05; Hale & Norcross, 85c.; Mexican, \$1.05; North Belle Isle, 10c.; Ophir, \$1.75; Savage, \$1.30; Sierra Nevada, \$1.30; Union Consolidated, 95c.; Yellow Jacket, 95c.

London. Nov. 7.

(From our Special Correspondent.)

The chief feature in the stock markets during the last week has been the temporary boom in the shares of the British South Africa Company on the receipt of the news of Lobengula's defeat. On November 2d, 3d and 4th, buyers rushed in to secure shares on the prospect of a great increase in the business of the company and a consequent advance in the value of its property on this reported clearing away of the black inhabitants. The price of the shares went up rapidly until further news arrived on the 6th that the victory was not by any means complete, and that the way has not yet opened for an expansion of the company's operations. So the buying ceased and the price was receded by quite half of the former advance. During the week South African shares have been consistently dull but firm.

American shares have received very little attention during the past week, though perhaps rather more business has been done than was reported in the preceding week. The repeal of the Sherman act has hardly any effect on silver and the silver shares, as the event was quite expected and the results anticipated. The only visible effect on the stock exchange was the falling of Elkhorns 3d., Jay Hawks 6d. and Montanas 3d.

Herqua Halas have fallen in value 2s. 6d. owing to an unfavorable report published by the company. This report says that on the discovery vein the drift run south above the first level has been dis-

continued, owing to its decrease in value and its diminishing width. Below the fourth level a winze has been sunk on the vein on the ore body. From the bottom of this winze on a level with the fifth they have commenced to drift east to meet the crosscut which is being driven west, the object being to make a quicker connection to remove the ore from the fifth level, as the rock in the crosscut is very hard and the progress slow. In drifting south on the course of the Iron vein, the developments have been very variable. The vein widens and narrows continually, owing to the frequency of the folds in the limestone foot wall. Its values also are changeable, ranging from \$8 to \$12 gold per ton. This report has caused much uneasiness among holders and in all probability sellers will become plentiful unless a better state of things comes about.

The Holcomb Valley manager reports that the delay in commencing operations will be at an end November 15th, on which date he hopes to be able to recommence work after the alterations and additions rendered necessary by the deficient water supply. The latest cablegram announces that the pipe line is in position and the chief pump is almost ready for work. No alteration is observable in the price of the shares, which remain at the low level reported last week.

Investors in Golden Feathers ought surely by this time to be thoroughly discouraged. In these paragraphs the opinion has already been expressed that one season is devoted to preparing for the next, and when the next season arrives the work has to be done over again, to prepare for the season following. This opinion appears to be justified by the circular just sent out by the directors. In it, they announce that, owing to the delay in opening the claim this season (caused by the break down of the Miocene flume last November, which made it necessary to do over again all the work of last season), they have deemed it advisable to cable the manager, Colonel McLaughlin, to devote all his energies to preparing the claim for next season, a work which they consider necessary to complete before trying for returns. The directors also report that the Colonel's answer is most cheerful, and that, as usual, everything is looking well and holds out promises for the future.

At the meeting of Flagstaff, Limited, held November 6th, the propositions of the directors to reconstruct the company, as already reported in this column, were confirmed. The directors also announced that they were going to do without the services of Professor Vincent as managing director of the mines, and they have accordingly omitted his name from the new directorate.

CURRENT PRICES.

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

Table of current prices for various commodities including Acetic acid, Commercial, Carbonic, Chromic, Hyarobromic, Hydrocyanic, Iodoform, Alcohol, Ammoniated, Alum, Copperas, Chromalum, Cobalt, Nitrate, Copperas, Corundum, Cryolite, Emery, Epsom salt, Feldspar, Fluorspar, French Clay, Fuller's Earth, Glauber's Salt, Glass, Gold, Kaolin, Kieserite, Lead, Litharge, Magnesia, Manganese, Mercuric Chloride, Marble Dust, Metallic Paint, Mica, and various other chemicals and minerals.

Table of current prices for various commodities including Cadmium Iodide, Chalk, China Clay, Domestic, Chlorine Water, Chrome Yellow, Chrome Iron Ore, Chromalum, Cobalt, Nitrate, Copperas, Corundum, Cryolite, Emery, Epsom salt, Feldspar, Fluorspar, French Clay, Fuller's Earth, Glauber's Salt, Glass, Gold, Kaolin, Kieserite, Lead, Litharge, Magnesia, Manganese, Mercuric Chloride, Marble Dust, Metallic Paint, Mica, and various other chemicals and minerals.

Table of current prices for various commodities including Mineral Wool, Ordinary rock, Naphtha, Nitre Cake, Ochre, Washed Nat Ox'rd, Powder, Golden, Domestic, Oils, Mineral, Cylinder, Dark filtered, Extra cold test, Dark steam refined, Phosphorus, Precip, red, white, Platinic Chloride, Pyram, Potassium-Cyanide, Bromide, Chlorate, Carbonate, Iodide, Nitrate, Potassium, Pyrites, Quartz, Kotten Stone, Lump, Original cks, Rubbing stone, Sai Ammoniac, Salt-Liverpool, Domestic, Common, Turk's Island, Salt Cake, Soapstone, Block and slab according to size, Sodium, Stannate, Tungstate, Hyposulphite, Strontium-Nitrate, Sulphur-Roll, Sylvinit, Talc, American No. 1, American No. 2, Terra Alba-French, English, American, No. 1, American, No. 2.

Table of current prices for various commodities including Tin-Crystals, Muriate, Double or strong, Oxymur, Vermilion, Am. quicksilver, Am. quicksilver, Chinese, Trieste, American, Zinc White, Antwerp, Red Seal, Paris, Red Seal, Muriate solution, Sulphate crystals, THE RARER METALS, Arsenic, Barium, Cobalt, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium-Lutrium, Gallium, Germanium, Glucium, Indium, Iridium, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Niobium, Osmium, Palladium, Potassium, Rubidium, Selenium, Strontium, Tantalum, Tellurium, Thallium, Tungsten, Uranium, Vanadium.

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, Dividend dates (Nov. 11-17), and Sales. Includes companies like Adams, Colo., Alpha, Nev., American Flag, Colo., etc.

*Ex-dividend. *Debit at New York stock ex. Unlisted securities. Assessment paid. Assessment unpaid. Dividend shares sold, 5,089. Non-dividend shares sold, 7,830. Total shares sold, 14,920.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, Dividend dates (Nov. 10-16), and Sales. Includes companies like Atlantic, Mich., Aitona, Mich., Astec, Mich., etc.

Dividend shares sold, 2,927. Non-dividend shares sold, 5,396. Total shares sold, 6,323.

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. Includes companies like Adams, s. l. c., Alaska-Treadwell, g. Alaska, etc.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

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

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ¶ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$2,380,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$190,000 before the reorganization in 1880. ††† This company acquired the property of the Raymond & Ely Company which had paid \$3,075,000 in dividends. †††† Previous to this company's acquiring Northern Belle, that mine paid \$2,400,000 in dividends against \$425,007 in assessments.

COAL AND COAL RAILROAD STOCKS.

Table with columns for stock names, dates (Nov. 11, 13, 14, 15, 16, 17), and sales. Lists various coal and railroad stocks with their respective prices and trading volumes.

Total shares sold, 201,940.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for stock names, dates (Nov. 11, 13, 14, 15, 16, 17), and sales. Lists industrial and trust stocks with their prices and sales figures.

Total sales, 361,503.

CALIFORNIA. San Francisco.

Table of closing quotations for San Francisco stocks, including Alpha, Alta, Belcher, and others, with columns for dates and prices.

COLORADO. Aspen.

Table of prices and sales for Aspen stocks, including Argentin Junlata, Aspen Contact, and others, with columns for price and sales.

COLORADO. Colorado Springs.

Table of prices and sales for Colorado Springs stocks, including Alamo, Anaconda Gold, and others, with columns for bid, asked, and sales.

Denver.

Table of prices and sales for Denver stocks, including Alamo, Anaconda, and others, with columns for high, low, and sales.

MARYLAND. Baltimore.

Table of Baltimore stocks, including Balt. & N. C., Corrad Hill, and others, with bid and asked prices.

MINNESOTA. Duluth.

Table of Duluth stocks, including Biwabik M. Iron Co., Cincinnati Iron Co., and others, with bid and asked prices.

Table of unlisted stocks, including Adams Iron Co., Arate Copper Mining Co., and others, with bid and asked prices.

Table of Montana stocks, including Bald Butte (Mont.), Benton Group, and others, with bid and asked prices.

MONTANA. Helena.

Table of Helena stocks, including Bald Butte (Mont.), Benton Group, and others, with bid and asked prices.

MISSOURI. St. Louis.

Table of St. Louis stocks, including Adams, American & Nettie, and others, with bid and asked prices.

PENNSYLVANIA. Philadelphia.

Table of Philadelphia stocks, including Bloomington C. & C., Buck Mountain C., and others, with bid and asked prices.

London Quotations.

Table of London quotations for various commodities and stocks, including Alaska Treadwell, Alaska Ter., and others, with columns for buyer and seller prices.

New York Mining Stocks.

Table of New York mining stocks, including Alice, Alta, Best & Belcher, and others, with bid and asked prices.

ASSESSMENTS.

Table of assessments for various companies, including Belle Isle, Belcher, and others, with columns for company name, amount, and date.

CLASSIFIED LIST OF ADVERTISERS.

Table with multiple columns listing various industrial and mining companies and their products, such as 'Adders and Calculators', 'Pumps', 'Engines', 'Machinery', etc.

FREE ADVERTISING.

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

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Positions Vacant.

1274 WANTED—A FIRST CLASS MECHANICAL SUPERINTENDENT for engine and boiler works. Good salary to competent man. Applications to state experience and salary expected. Address GLOBE, ENGINEERING AND MINING JOURNAL.

1275 WANTED—FOREMAN AT SILVER MINES in Ontario, Canada. Good wages to the right man. Must become stockholder in company. Address ONTARIO, ENGINEERING AND MINING JOURNAL.

1276 WANTED—A MILLMAN, WHO HAS had thorough experience in managing a wet crushing silver mill; permanent position and liberal salary to a competent man. Address NEW MEXICO, ENGINEERING AND MINING JOURNAL.

1277 WANTED—A MINING ENGINEER with experience in the management of mines containing silver and gold; permanent position. Address NEW MEXICO, ENGINEERING AND MINING JOURNAL.

1278 WANTED—PERSON THAT THOROUGHLY UNDERSTANDS HYDRAULIC WORK. Need not be a mining engineer, but rather a man to take second place, to take charge of active work. Address NORTH CAROLINA, ENGINEERING AND MINING JOURNAL.

1279 WANTED—A GOOD YOUNG MAN AS gold and silver assayer. Address ASSAY, MINING AND ENGINEERING JOURNAL.

1280 WANTED—A RELIABLE AND COMPETENT ENGINEER to examine a water power within three miles of a railroad station in North Carolina, and report (among other things) upon the following points: (1) The present horse power with the dam, etc., as now located and built. (2) The total possible horse power. (3) A comparison between this particular water power and one on the same river, but a few miles below. Address RALEIGH, ENGINEERING AND MINING JOURNAL.

1281 WANTED—A SKILLED MECHANIC for a forge shop, to design dies and other tools for manufacturing railroad specialties. Experience in preparing rolls necessary. Address, with references, nature of experience and compensation required, AJAX, ENGINEERING AND MINING JOURNAL.

1282 WANTED—A MAN THOROUGHLY qualified by practical experience to handle ores, etc., by the cyanide process of extracting gold from sulphureted ores, in a Southern gold mine. A mine ore worker, and not a laboratory, speculative theorist, is what is wanted. Address, with unqualified recommendations, stating wages expected, etc., VIRGINIA, ENGINEERING AND MINING JOURNAL.

Situations Wanted.

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

A HYDRAULIC MINER, AGED 36, BORN and raised in the mines of California, with a number of years practical experience with high-banks, bank-blasting, sluice tunnel running, ditch-work, etc., etc., wants position. Best Reference, Address P. O. Box No. 183, Nevada City, Cal. No. 15,515, Nov. 25.

CHEMIST—YOUNG ANALYTICAL CHEMIST who is not afraid of any amount of hard work wants place as chemist or assistant. Have had some technical experience and the best of professional training. References furnished. Address "X," ENGINEERING AND MINING JOURNAL. No. 15,516, Nov. 25.

PRACTICAL ENGINEER, DRAUGHTSMAN and mechanic, 38 years old, member of American Society of Mechanical Engineers, experienced in planning, erecting and handling boilers, engines, mill work, cable driving, labor saving devices, steam, hot water and air heating, ventilation, proficient in steam economy and best modern practice in generation and transmission of power, for the past eight and a half years Master Mechanic on one of the largest railroads in New England, in charge of engineers, firemen, mechanics, laborers, locomotives, engine-houses, supervising the fitting out and maintaining same, solicits temporary employment or permanent position. Best of references. Address EXPERT, ENGINEERING AND MINING JOURNAL. No. 15,516, Nov. 25.

MINING AND MECHANICAL ENGINEER, having completed some large undertakings, involving the development of special appliances and systems, is open to engagement. Will accept as compensation percentage of savings effected. Address ECONOMY, ENGINEERING AND MINING JOURNAL. No. 15,518, Nov. 25.

CHEMIST, ASSAYER AND ENGINEER.—A recent M. S. graduate desires to enter the mining and metallurgical profession; would be an assistant to a first-class mining engineer. Address C. C. MOORE, JR., Lexington, Ky. No. 15,506, Nov. 25.

PRACTICAL COPPER SMELTER DESIRES a position; several years' experience in matte smelting, bar smelting and refining; good assayer; also understands the erecting and working of furnaces; speaks Spanish and English; good references. Address REGULUS, ENGINEERING AND MINING JOURNAL. No. 15,507, Nov. 25.

WANTED—POSITION BY YOUNG MAN thoroughly familiar with the manufacture of platinum fuses. Has had five years' practical experience as superintendent in fuse factory. Address W. S. WILLMARTH, Amityville, Long Island, N. Y. No. 15,500, Dec. 2.

AN EXPERIENCED CHEMIST, WITH BEST scientific and practical training, would like to take charge of laboratory, works or chemical department in larger concern. Address DOC., ENGINEERING AND MINING JOURNAL. No. 15,506, Dec. 2.

COMPETENT MINING ENGINEER, GRADUATED from the Freiberg Academy of Mines and thoroughly familiar with all the branches of the mining industry, wants position. Best references. Address A. G. VOGEL, 29 Broadway, N. Y. No. 15,519, Dec. 2.

TECHNICAL CHEMIST—FIRST-CLASS scientific education. Many years' practical experience as superintendent in best European and American works in the manufacture of acids (sulphuric, nitric hydrochloric), alkali by Leblanc and ammonia processes ammonia, fertilizers, alumina products, copper extraction, etc. Address A. Z., ENGINEERING AND MINING JOURNAL. No. 15,497, c.o.w., Dec. 23.

MEMBER OF AMERICAN SOCIETY MECHANICAL ENGINEERS, who has had 20 years' practical experience as follows: Machinist, chief draughtsman, erector of engines and machinery, engineering, estimating, contracting, office work and superintendent of large engine works—is available for responsive position. Address SUPERINTENDENT, ENGINEERING AND MINING JOURNAL, 531 Rookery, Chicago, Ill. No. 15,517, Dec. 23.

WANTED—A POSITION IN SOUTH AFRICA by a metallurgist and mining engineer (Columbia), three years' experience in smelting and leaching in the West. Good references. Address SOUTH AFRICA, ENGINEERING AND MINING JOURNAL. No. 15,509, Dec. 23.

RESPONSIBLE POSITION WANTED BY A graduated chemist and engineer; superintendency or assistant superintendency in steel works or blast furnaces preferred; is a metallurgist and can burden furnace; is well up in modern engineering practice; thoroughly understands machinery and the economies of production; can design and build mills or furnace plants. Address "MODERN ENGINEERING," ENGINEERING AND MINING JOURNAL.

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PUMPING ENGINES.—Sealed proposals for furnishing two sewage engines will be received by the Sewerage Commissioners of the City of Brockton, Mass., until December 1st, 1893, at their office, Room 27, Home Bank Block, Brockton, Mass. The work consists of furnishing, setting up and completing, ready for use, two pumping engines and two boilers, piping and all necessary appliances and fittings such as are to be found in pumping stations of the first class. Each engine must be capable of easily raising 5,000,000 gallons of sewage per day 46 ft. through 16,650 ft. of 24-in. cast-iron pipe. Each boiler must be capable of supplying steam for one of the engines when discharging 5,000,000 gallons per day. Each proposal must be made on the blank forms furnished by the Commissioners, and must be accompanied by a certified check for the amount of \$500. Forms of contract and specifications can be obtained and plans seen at the above office. The right to reject any and all bids is expressly reserved. R. P. KINGMAN, A. C. THOMPSON, H. A. MONK, Sewerage Commissioners. F. HERBERT SNOW, City Engineer.

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ENGINEERING AND MINING JOURNAL, New York.

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.

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 \$4,050 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. 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.

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.

TREASURY DEPARTMENT, OFFICE SUPERVISING ARCHITECT, Washington, D. C., November 17th, 1893.—Sealed proposals will be received at this office until 2 o'clock P. M. on the 12th day of December, 1893, and opened immediately thereafter for all the labor and materials required for completing the plumbing and sewerage at the United States Court House and Post Office building at Helena, Ark., in accordance with the drawings and specification, copies of which may be had at this office, or the office of the Custodian at Helena, Ark. Each bid must be accompanied by a certified check for a sum not less than 2 per cent. of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, if it be deemed in the interest of the government to do so. All bids received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes sealed and marked, "Proposal for Completing the Plumbing and Sewerage at the United States Court House and Post Office Building at Helena, Ark.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

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Co.; Pleasant Valley Coal Co.; Corinne Mill, Canal & Stock
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COLORADO SPRINGS, Colo., November 1st, 1893.

DIVIDEND NO. 40.

A dividend of five cents per share (\$50,000) has
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PERCY HAGERMAN, Sec'y-Treas.

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