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ALL subscribers to the ENGINEERING AND MINING JOURNAL at \$5 yearly, who are not in arrears, are entitled to a copy of the "Mineral Industry," in paper covers, or, for 50 cents extra, to a copy bound in cloth. This offer applies to all subscribers paying up before July 1st; those in arrears after that date will receive the book only on payment of the regular price, which is \$3 for the volume in paper covers or \$2.50 in cloth.

THE new Cunard steamer "Campania," on her first voyage from New York to Liverpool, broke the record for speed on an east-bound trip, averaging 21.15 knots for the whole voyage, while on one day the average speed reached was 22.24 knots an hour. This magnificent performance was made on Pocahontas coal, which was used entirely on the voyage.

OUR esteemed contemporary, the *Elk Mountain Pilot*, of Crested Butte Colo., criticises very sharply a table given in our issue of April 8th as an attempt to deprive Colorado of the credit due for her production of anthracite and coke. If, however, our contemporary will read with a little care the table to which he makes such violent objection, he will see that it does not give the production of the various classes of fuel at all, but simply the output of pig iron manufactured with coke, anthracite and charcoal.

THE total dividends paid by the Witwatersrand mining companies in 1892 amounted to £833,212, or about 16 per cent. of the gold output reported for the district; the greatest amount paid by any one company, £190,312 by the Robinson, being at the rate of 7 per cent. Other companies paying a less amount made a better return to their stockholders. Thus the Ferreira paid £56,250, or at the rate of 125 per cent.; the Crown Reef, £63,000, or at the rate of 55 per cent.; the Jubilee, £17,502, or at the rate of 60 per cent. The Birthday Mining Company, in the Klein Letaba district, paid £22,150, or at the rate of 15 per cent. on its capital stock. The South African mines at present are making larger returns to English owners than these are receiving from their investments in any other country.

FROM time to time we read of some invention for the burning of petroleum in furnaces which is going to "revolutionize industry" and to "drive coal out of the market." The simple fact is that petroleum has been for years, and still is, used successfully as a steam-producing fuel, and its use in place of coal anywhere is a question, not of the appliances available, but simply of cost. Where oil is cheap and coal is dear the former will be used, as, for instance, in some parts of Russia. On the Southwestern Railroad in that country oil is used in many of the locomotives, and the steamers on the Caspian Sea burn *astarki*, the petroleum refuse from the Baku refineries. In our own country oil is not likely to come into general use as a steam fuel until coal becomes much more costly than it is now; not because oil cannot be used, but simply because it costs more.

THE great West is waking up to the dangers of the continued purchases of silver, and is beginning to call for the repeal of the Sherman act. The ENGINEERING AND MINING JOURNAL, which opposed this act from the beginning, has pointed out many times the results which have now come upon us. Now let our Western papers look into the monetary clearing-house plan for establishing bimetalism, give it support and our government will propose it, with good prospects of securing its adoption. The financial stringency which is creating so much distress throughout the country is due chiefly to distrust abroad in our ability to maintain gold payments owing to these insane silver purchases. Let the Sherman act be repealed at once, and until some international agreement is arrived at let our government accumulate gold, if necessary, by a sale of bonds.

WE note with much satisfaction that a monument is being erected by a number of Western mining men over the remains of the late Prof. J. E. CLAYTON, in Portland, Ore. It is a deserved tribute to the memory of an energetic and studious miner who did as much perhaps as any one man in the West to unravel the mysteries surrounding vein formation and to apply his knowledge, gained through the experience of years, to the successful working of mines. It will be remembered that it was CLAYTON who first recognized the possibilities of the now famous Granite Mountain Mine, and who located the faulted Drumlummon vein. It is unfortunate that Professor CLAYTON did not leave his own monument behind in a work embodying his valuable experience and observations, as was his intention, we understand, when he met with the sad accident in Idaho which resulted in his death.

THE agreement reached by the Pennsylvania and the Baltimore & Ohio in connection with some Southern lines to raise rates on pig iron went into effect June 1. The change has been very sharply criticised by some of the Southern iron men, and it has been intimated that the increase had been demanded by some of the Pennsylvania furnaces and must be considered in the light of "protection" for them against the inroads of the Southern brethren on their trade. On the other hand, the roads, of course, claim that their pig-iron rates have been too low, and that iron has really been carried at a loss, so that the increase was needed to protect them-

selves. However this may be, the new rates must make some trouble for the Southern furnaces, which have been working on a very narrow margin, or no margin at all, at present prices. One or two of the Alabama furnaces have begun to ship by river from Florence, but only a few are so situated that they can take advantage of the water line. It will help to impress upon the Southern iron men the advice recently given them by the JOURNAL that dependance should not be placed on pig iron alone, but that steps should be taken, wherever it is possible, to convert their pig into steel on the spot, and to turn out their iron in manufactured shape and not in crude form alone.

EL CALLAO MINE, Venezuela, from which there have been taken 652,350 tons of quartz, yielding 1,387,646 oz. of gold, and which has paid dividends amounting to \$9,666,440, the most important gold mine of Venezuela and one of the great mines of the world, is nearly exhausted, and work on it will soon cease. This result has not, however, been unexpected. As long ago as 1886 it was known that El Callao vein had taken an upward turn, and, although hopes were entertained that it would again dip downward, continued exploration proved its basin-like shape. A most liberal system of exploration was adopted, a half million dollars being expended for this purpose during the four years ending in 1890, representing about 3½ miles of drifts cross-cuts and winzes, but as these were continued, it became more and more certain that there was no prospect of striking pay ore in depth. Shaft No. 6, the most westward, was sunk to a depth of 340 metres, and drifts run in every direction, but no pay-rock was developed; on the contrary, the vein pinched more and more, and the gold content rapidly decreased from 2.45 oz. per ton in 1886 to .59 oz. in 1891. The culmination was reached in 1892, and on December 5th Superintendent WEBBER advised that the pillars be robbed and the mine abandoned. Following this, it was reported that President LICCIONI had refused to give his consent, as he believed it best to preserve the good condition of the underground workings, and thus permit a new company to raise capital for further exploration. It seems, however, that the directors decided otherwise, for the work of robbing the pillars was commenced immediately. Meanwhile the work on shaft No. 7, 1,420 ft. west of No. 6, which was begun on May 1st, 1892, on account of the favorable appearance of the lower southwest workings, had been abandoned at a depth of 195 ft. owing to the discouraging outlook. The latest report we have received from this mine is dated March 12th, 1893, and it says that the work of robbing the pillars is proceeding rapidly, that a number of stopes have already been abandoned for fear of accidents, and that the lower workings are filled with water. A new shaft, No. 8, has been opened to the north of No. 4 with the hope of striking the ore abandoned on account of the cave-in of 1891. This shaft has reached a depth of 140 ft., but only a small stringer of ore was cut. At present advices, the future of the company rests upon the Caratal mine, belonging to the Colombia Mining Company, the exploration of which was urged by SUPERINTENDENT WEBBER, but as yet no ore of value has been found in quantity. During the first two months of the present year, some 1,550 tons of ore from this mine were crushed, from which a yield of 1,463 oz. of gold was obtained, but the expenses equaled the value of the product. Should ore be found in quantity, a railroad, 10 miles long, must be built to carry the ore to El Callao mill.

THE READING REORGANIZATION

As heretofore outlined, the reorganization scheme offered to the stockholders of the Philadelphia & Reading companies, involves the issue of \$30,000,000 in six per cent. collateral trust bonds, the funding of five years' interest on the general mortgage bonds, the reduction of interest on several issues of the leased line securities and the reduction of the dividends paid the Lehigh Valley stockholders under the lease to five per cent. yearly. Of the new issue of \$30,000,000 in bonds, \$2,000,000 are to be sold at once to clear off the floating debt, and the remainder will be retained for working capital; \$2,000,000 to be issued each year for five years to come. The stockholders are also to be asked to place their stock in trust for seven years to come. The acceptance of this plan is contingent upon the consent of at least 90 per cent. in the amount of the general mortgage bonds. This is necessary to its success, as holders of 10 per cent. of these bonds are entitled to demand a foreclosure in case of default upon the interest. It is said that the consent of the Lehigh Valley people to the reduction of the interest has been secured, which speaks volumes against the management of the road under Mr. WILBUR. As to the minor leased lines, the position of the company is very simple; they can either accept the reduction or resume possession of their property—a course which very few of them are in a position to take.

It is stated that the bankers who are backing the reorganization plan have agreed to take all the new bonds which are not absorbed by present stock or bondholders and to purchase any coupons which the holders are not prepared to fund. The latest advices are that the scheme is not altogether meeting with favor and that many bondholders are reluctant to give their assent. The prospects are, however, that the plan will go through, as there are so many interests involved that its powerful advo-

ates will hardly allow it to fail. It may be added that if the company had been more open and honest in its course and the managers had taken the owners of the property into their confidence, and given them some real information about their estate, these might be more ready to come forward and help the company out of its difficulties. The managers have acted as if they owned the property, instead of being trustees for the real owners who have to bear the burden, when the ambitious schemes of the officers end in disaster.

The plan will add \$1,800,000 at least to the yearly charges to be borne by the Reading property, and it is extremely doubtful whether it will be any better able to carry this at the end of five years than it is now. The company will have a breathing spell under the plan, but the heavier load to be carried at the end of the rest will surely result in another break down, which will probably bring disintegration or a heroic scaling down of indebtedness.

THE APPRECIATION OF GOLD.

The relative production and value of gold and silver have varied greatly in the past. In 1493, or 400 years ago, the production was by weight, only 8.1 of silver to 1 of gold, though the value of gold was then 10.7 times that of silver. Silver was undervalued, yet its market price did not increase. From 1520 to 1620 the product of silver increased enormously, while that of gold was nearly stationary; in 1600 it was no less than 56.8 times that of gold, and yet the value of gold had appreciated only to 11.8 times that of silver. Silver was then greatly overvalued. During the next 160 years the production of silver declined while that of gold steadily increased, until, in 1760, the proportions by weight were 21.7 silver to 1 gold or not much more than one-third what it was in the year 1600; yet during this period the relative value of gold increased about 27 per cent., or to about 15 times that of silver. During the 50 years from 1760 to 1810 the output of silver again increased largely, while that of gold declined—the proportion reaching in 1810 the figure of 50.3 silver to 1 gold—but it then began to decline, owing in part to an actual reduction in the output of silver up to 1855 and in part to a rapid increase in that of gold after the discovery of the California placers in 1849. From 1850 to 1860, when the output of gold reached its maximum, the production of silver was only 4½ times that of gold, yet the value of gold continued to be nearly 15½ times that of silver, that being about the average ratio of value in coinage. From about 1670 until 1870 the value ratio of gold to silver varied only between the limits of 14½ to 15½, notwithstanding the enormous fluctuations in production ratio between the limits of 4 up to 50 silver to 1 gold.

This stability in value between the metals under widely varying conditions of production was unquestionably due to the fact that during nearly the whole of that period every nation was using silver as its chief money, and the total output of the world was absorbed at the coining ratio either for coinage or for hoarding, which was practiced more generally in those days of wars and political uncertainties than at present.

In the year 1892 there was produced in the world about 30.2 times as much silver as gold and the market value of gold was only 23.73 times that of silver; the decline having been continuous since 1860, with the exception of a rise in 1890 due to the heavy purchases of silver by the United States Government under the "Sherman Act." The statistics demonstrate conclusively that the commercial value of silver as compared with gold is not necessarily closely governed by their relative productions and that stability in the value ratio between the metals could be very easily maintained by international agreement, even under much wider fluctuations in relative production than could occur under the operation of the plan proposed by the ENGINEERING AND MINING JOURNAL, which takes account of, and adapts itself to, the changing conditions and lessening cost of silver production. The statistics also seem to demonstrate the gradual decline in public estimation of the white metal, owing, apparently, in part, to its greater abundance and lessening cost of production; in part to the greater cost of its transportation and storage, and in part to the declining use of metal money in the business of the world due to increasing facilities for distribution and exchanges of goods and money, to the greater freedom from war and greater safety of property; to the increase in knowledge and confidence between the inhabitants of the world, and to the restriction in the use of silver in coinage in Europe. No one of these causes would alone account for the great decline in the value of silver, but they react on each other until the net result is a steadily declining value for the metal and, while these conditions obtain, the statistics disclose nothing which would justify the belief that the value of silver will increase or even be maintained.

Silver is a far more abundant metal than gold in nature, and the progress in metallurgical knowledge will probably always reduce its cost of production relatively more than it will that of the rarer metal. Moreover, the increasing wealth of the world and the need of transporting or storing vast sums increase the convenience and appreciate the value of the more precious metal.

There has unquestionably been a considerable appreciation in the value of gold, not only as compared with silver, but as measured by nearly all

other product, and the fact that the production of gold has been almost stationary for thirty-five years shows that at its relative value during that period its production has not been sufficiently profitable to cause capital to embark in it except in comparatively rich mines. It seems certain that the value of gold will continue to appreciate, or, in other words, that products of all kinds will continue to depreciate in value not only because of improvements which permit their cheaper production, but because gold itself is appreciating in value owing to the demand for larger quantities of it than can profitably be produced at its present value. If silver should be demonetized everywhere, as is inevitable unless some international agreement for bimetalism or a wider use for the metal be adopted, then the demand for gold must necessarily be enormously increased, and its value will appreciate in a still greater degree; that is the value of everything, whether metals, breadstuffs, manufactures or labor, will decline.

Under general demonetization it is not unlikely that the entire first direct loss on silver alone might amount to 50 per cent. of the present coinage value of the silver money in the world, or, say, \$2,000,000,000. And this loss would come so suddenly that it would utterly bankrupt the silver basis countries.

So long as the silver country could produce within itself what was necessary for its existence it could continue to use its silver, but no civilized country can close its gates to the commerce of the world, and yet with the heavy and fluctuating discount on exchange the silver countries could not afford to import the goods manufactured in the gold countries. Neither could the silver countries pay interest in gold on their national or industrial securities.

There seem therefore to be but two horns to this dilemma. 1st. The silver nations, such as India, China, South America, Mexico, etc., might continue on the silver basis and default on all obligations calling for gold, and cease to buy goods which had to be paid for in gold, which would close the factories and bankrupt the gold standard countries; or, 2d, all nations would discard silver and use only gold—which would bankrupt the silver nations, when they could buy nothing and pay no debts. Moreover, it would so increase the demand for and value of gold that it would utterly derange values throughout the world and bring irreparable injury and misery before the industry of the world had been adapted to the new conditions. Wages, of course, would decline enormously.

England is already finding her export trade declining, because the silver basis countries, unable to pay even the present exchanges, are forced to stop buying her goods, and their railroads and industrials are unable to pay interest or dividends in gold when their receipts are in silver.

The world is so narrow and knowledge so wide that no country can now prosper by a policy that bankrupts its neighbors. As the prosperity of one extends beyond its borders and enriches others, so the bankruptcy and misfortunes of one injure all. Render the finances and credit of the borrowing and consuming countries safe and good and their increasing orders would set the wheels of industry in Europe moving with increased velocity, while their prompt payment of debts and the new fields they would open for investment would add to the wealth of their great European creditors.

The adoption of the international monetary clearing-house plan proposed by the ENGINEERING AND MINING JOURNAL would bring about this improved credit; would establish on a firm and stable basis the money of the world; would prevent the undue appreciation of gold, and, while bringing incalculable benefit to all, and especially to England, would cost no sacrifice or injury to any nation.

NEW PUBLICATIONS.

THE CANADIAN ENGINEER, VOLUME I., No. 1. Toronto, Ont. The Canadian Engineer Co. Pages 32.

The first number of our new monthly contemporary makes an excellent appearance, and contains a variety of interesting matter. It proposes to devote its attention to the interests of Canada, especially in the departments of mechanics and mining. The field is large enough to occupy our contemporary's full attention, and it evidently means to deserve the success which we cordially wish it.

TELEPHONE LINES AND THEIR PROPERTIES. By Prof. William J. Hopkins. London and New York: Longmans, Green & Co. Pages 258; illustrated. Price \$1.50.

In this book the author has undertaken to give a general idea of the construction and management of a telephone line, and the theory of the telephone in such a way that they can be readily understood by the reader who is not a skilled electrician. He has avoided technicalities as far as possible, and has not used mathematical formula or demonstrations. There are seven chapters devoted to construction, the subjects being: Pole and Wire Lines; Underground Lines; Long Distance Lines; Wire; Insulators; Exchanges, and Switchboards. The remaining chapters deal with the theoretical part of the subject, being on the Propagation of Energy; the Telephone Current; Measurement of Currents; City Lines; Interferences; Metallic Circuits, and Cables. An appendix treats of Oscillations and Induced Currents. The book is clearly written, and will be a useful one for all who want a general knowledge of the subject.

ELECTRICAL MEASUREMENTS AND OTHER ADVANCED PRIMERS OF ELECTRICITY. By Professor Edwin J. Houston. New York: The W. J. Johnston Company, Limited. Pages, 430; illustrated. Price \$1.

This is the second volume of Professor Houston's series of elementary electrical treatises for students and non-technical readers. A third volume will complete the series, but there is no necessary connection between the several volumes, each one being complete in itself, as are the several primers in each volume, as far as possible. The present book derives its title from the first three parts or primers, which are respectively on the measurements of electric currents, electromotive forces and resistances. The object of these is not so much to teach the practical operations of electrical measurements as to explain in simple, but exact, terms the principles and apparatus upon which they are based. Two sections are on voltaic and thermo-electric cells and other sources of electricity. The principles upon which commercial currents are based are explained, and another part of the book is devoted to the principles and applications of dynamos, motors and transformers, the last section being a general review. The pages on electric lighting and power deal thoroughly with the different methods and apparatus in practical use. This section will be particularly useful to the large class of intelligent readers who desire to obtain a correct knowledge of the applications of electricity.

THE YOSEMITE, ALASKA AND THE YELLOWSTONE. By William H. Wiley and Sarah King Wiley. London: "Engineering," and New York: John Wiley & Sons. Pages, 236; illustrated.

The record of travel given in this handsome volume was originally published in the form of letters written to the London "Engineering" describing the trip made by the writer in connection with the excursion of the American Society of Mechanical Engineers to the Pacific Coast in the spring of 1892. The journey was extended to Alaska and covered in all some 10,000 miles of travel through the most picturesque portions of our country. Mr. Wiley is a very bright and entertaining correspondent, as the readers of "Engineering" know, and he has made his letters excellent reading, while at the same time managing to convey much solid information. To any one wishing to undertake the same journey, or a portion of it, they will serve as an excellent guide. To any one who has not visited the Pacific Coast they will give a better idea of the extent and value of that section of the country than any more solid and statistical work could convey. It certainly has this merit, that there is very little in it which the reader will want to pass over or wish had been omitted.

The book contains a great many illustrations, most of them from photographs, and some of them well executed, though many are hardly up to the standard.

Mr. James Dredge, editor of "Engineering," has written an introduction in which he speaks briefly of the great growth of the Northwest and its prospects for the future.

THE PEOPLE'S MONEY. By W. L. Trenholm, Ex-Comptroller of the Currency. New York: Charles Scribner's Sons, 1893. Pages 280.

At a late meeting of the American Academy of Political and Social Science, Mr. Trenholm, in a very able address upon the currency, took occasion to say that very few members of Congress were thorough students of the currency question, although it was the most momentous of any awaiting solution at their hands. "But," said he, "there is one way to make them study the subject, and that is by the people taking it up themselves." The book before us was written to forward this purpose; to instruct the people in the currency of our country in order that they may demand sound legislation from their representatives. To many the financial system of the United States appears so intricate, that they despair of comprehending it; to others, the subject is dull; to but few is it interesting, yet there is nothing that so concerns every man, woman or child in the country as the kind and quality of the money that all depend upon to carry on business, and, in our history, there has been no time when the question of good sound money was of greater importance than at present. This is to a certain extent demonstrated by the large amount of space devoted to the subject by the press, which, after all, but makes public the smouldering uneasiness of the people.

Mr. Trenholm brings to his discussion of the subject not only great practical experience acquired as Comptroller of the Currency, but also the ability to explain clearly and forcibly and with wealth of homely illustrations, which interests the reader, and brings home to him the truth sought to be conveyed.

In the beginning, the author treats of cash and credit, and explains what money is; following this, it is shown that while money has a basis in natural law, it needs confidence and law, and that definiteness and stability are its sole essential qualities.

The monetary unit is then explained, as likewise the nature of legal tenders. Mr. Trenholm thinks that the present multiplicity of legal tenders, in which term he includes gold and silver coin, coin certificates and greenbacks, is a menace to the stability of the currency, and advocates the repeal of the Silver Purchase Act and compulsory coinage loans, the permanent settlement of the monetary unit as 25-8 grains of gold, and the final affirmation by the Government of the interconvertibility of the standard and silver dollar with the gold dollar at the Treasury.

The difference between Government notes, National bank notes, and the notes of banks of issue is clearly defined, and the advantages and disadvantages of each class clearly explained. It is the author's opinion that, with proper safeguards, the notes of banks of issue fill the needs of the different communities to a much greater degree than any of the others—his contention being that such currency is elastic and promotes industrial enterprise by lowering the rates of interest. These chapters are especially interesting at present in view of the fact that many of our Congressional representatives have declared their intention to vote against a repeal of the Sherman Act unless some measure providing for an increase of currency is adopted at the same time. In closing, the author discusses values and standards for measuring values; life, labor and property are in turn examined, with

the result that property alone can be used, and that the term is naturally restricted to either gold or silver. This being admitted, he then shows why gold has become the standard of the foremost industrial nations, while silver is the standard of less civilized people; no attempt is made, however, to discuss bi-metallism. The author's conclusion is that the gold standard is the result of a natural process of evolution—that it is an example of the survival of the fittest, and that in adopting it, the advanced industrial nations have only obeyed natural laws governing the improvement and perfection of all things.

While we cannot agree with all of Mr. Trenholm's deductions, we recommend this book to our readers, confident that it may improve their understanding of, and quicken their interest in, what is now the most important question before the American people,—a sound and honest currency, acceptable the world over.

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.

Columbia College School of Mines: Circular of Information, 1893-94. New York; issued by the College. Pages, 100.

The Mining Manual for 1893. By Walter R. Skinner. London, England: W. R. Skinner. Pages, 700; price (delivered in New York), \$4.40.

A Practical Treatise on Foundations. By Prof. W. M. Patton, C. E. New York: John Wiley & Sons. Pages, 402; illustrated. Price \$5.

The Movements of Our Population. By Henry Gannett. Washington: The National Geographic Society. Pamphlet. Pages, 44; illustrated.

Report of the City Engineer of the City of Denver, 1892. J. S. Hunter, City Engineer. Denver, Colo.: Published by the City. Pamphlet, 52 pages; illustrated by maps.

Geological Survey of Texas: Report on the Brown Coal and Lignite of Texas. By Edwin T. Dumble, State Geologist. Austin, Tex.: State Printers. Pages, 242; illustrated.

Annual Report of the Board of Regents of the Smithsonian Institution for the Year Ending June 30, 1893: Report of the United States National Museum. Washington: Government Printing Office. Pages, 810; illustrated.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested. All letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

"Nickel-Winning."

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Your interesting editorial of May 13th upon the subject of nickel contains the remark: "Indeed, it may be said that the day of wet processes for nickel-winning is past." Will you allow me to suggest a qualification of this assertion?

The word "nickel" has two significations in commerce. It may mean true elemental nickel, commercially pure, or it may signify an alloy of nickel and cobalt associated with appreciable quantities of copper, arsenic, sulphur, iron and manganese. For some purposes, such as armor-plates, the nickel-cobalt alloy is good enough; but for the manufacture of German silver, and for anodes in "silver-white" nickel-plating, first-class results can only be attained by using pure nickel. And as no wholly dry process hitherto employed is capable of separating cobalt, or even (to a thoroughly satisfactory extent) copper, arsenic and manganese, from nickel, it would appear that a portion of the nickel consumed in the world's industries will continue to be produced either altogether in the wet way or by a judicious combination of wet and dry methods.

The introduction of the Canadian nickel into the market has caused the distinction here drawn to become of practical importance. So long as the market was supplied with metal from the comparatively pure New Caledonian ore there was not very much to choose between the French article and that made in the wet way by America's "Nickel King," Mr. J. Wharton, of Camden, N. J. But the Canadian pyrrhotite carries much copper, cobalt, arsenic and manganese, in addition to its normal iron, sulphur and nickel; and metal produced by dry methods from such a raw material is not fitted for fine uses. Hence, there are now two grades of nickel in the market; and consumers are becoming aware of the fact.

YOUNGWOOD, Pa., May 15, 1893.

STEPHEN H. EMMENS.

"The Mineral Industry" for 1892.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Your "Mineral Industry" represents marvellous industry.

MARQUETTE, Mich., May 13, 1893.

RICHARD A. PARKER,
Mining Engineer.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: It is a real pleasure to possess such a volume of facts on so important topics by a corps of eminent and capable contributors.

CARLISLE, Pa., May 24, 1893.

W. F. HORN.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I am very much pleased with "The Mineral Industry" volume. It does you great credit.

SYRACUSE, N. Y., May 24, 1893.

W. B. COGSWELL,
General Manager Solvay Process Company.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Without venturing to give an opinion upon a book that I have barely glanced over, promising closer attention by-and-by, its general

lines should make it of great value to the community, especially to those (like myself) who take a close interest in the questions therein treated.

C. N. JORDAN.

OFFICE OF ASSISTANT TREASURER, UNITED STATES,
NEW YORK CITY, May 15, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: It gives us great pleasure to congratulate you upon its comprehensiveness and instructiveness. It certainly represents an enormous amount of labor and will, we believe, prove the standard work on the subject. All details of the production, manufacture and consumption of copper you appear to have supplied with much minuteness and exactness. We shall greatly value the book as one of reference.

JAMES LEWIS & SONS,

Liverpool Copper Wharf Company, Ltd.

5 FENWICK STREET, LIVERPOOL, England, May 16, 1893.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In acknowledging the receipt of "The Mineral Industry" for 1892, I cannot refrain from adding my meed of praise to the splendid statistical volume of the mineral resources there gathered. No one interested in the industrial statistics of this country can afford to do without this most excellent compendium so ably and conscientiously prepared. I am surprised at the magnitude of the undertaking. I thought Muhlhall's Dictionary of Statistics was an immense enterprise, but "The Mineral Industry" comprises such a mass of data that it cannot help but be properly appreciated. W. H. EGLE, M. D.,
HARRISBURG, Pa., May 18, 1893. State Librarian.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I have your volume, bound neatly, of "The Mineral Industry and Statistics," 1892. It is a very remarkable treasury of information of the minerals of the United States and foreign countries. It affords in a clearly arranged and comprehensive system the localities and properties of the industrial minerals, with full statistics of cost and amount of production for the year 1892. It also gives the products of the past years, thus affording full data for comparing the relative progress of each industry. It is a monument of persistent and well-directed hard work, deserving sincere thanks for its great helpfulness to all engaged in these great industries.

JOHN FULTON,

JOHNSTOWN, Pa., May 11, 1893. Mining Engineer Cambria Iron Company.

Solid Silverware Cheaper than Plated.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The investigations of the Mint put the consumption of silver in the arts (coinage value) as follows: In 1889, when the average price was 93 cts., value, \$8,569,318. In 1890, with an average price of \$1.06, value, \$9,031,178. In 1891, with average price 98 cts., value, \$9,631,746. In 1892, with average price 87 cts., value, \$9,106,540.

It is surprising that the low price of silver has not, to a larger extent than seems to have been the case, stimulated its consumption in the arts. The production of the salts of silver, especially its nitrate, employed so extensively in photography, would not sensibly be affected by even a notable rise or decline in value, but not so the use of the metal itself. With a decline in silver from \$1.29 to 83 cts. the replacement of plated ware by sterling metal ought to be inevitable, and in this substitution we see the only reason why silver may not decline permanently much below its present figure, be its monetary status what it may. Manufacturers are slow to meet the altered value of a metal by reducing, even proportionately, the price of their manufactured wares, but of late the fact that silver has descended to a lower grade in the scale of metallic value, and will probably remain there, has evidently convinced some of the large silver manufacturers that a great reduction in the price of certain classes of silverwares should be made and that if made, the increased sales will compensate for the decreased profit on each ounce manufactured. The largest house on the Pacific, that of Shreve & Co., of San Francisco, now retails stamped silverware at \$1.15 per ounce, and has sold out its entire stock of plated ware. The Eastern combination of silversmiths has fixed its retail price of similar goods at \$1.60 per ounce. It is a fair presumption, however, that if one important house can sell at \$1.15, that is a profitable price for wares upon which slight hand labor is expended.

Assuming, therefore, that when silver is at 83 cts. forks and spoons and certain massive articles of tableware can be profitably sold at \$1.15 per ounce, considerations of economy will make it more profitable to buy silver than to buy plated ware. Take, for instance, tablespoons. One dozen triple-plated spoons weigh 19½ oz., and retail at \$14.50 per dozen, which is \$1.20 per spoon, or 73 cts. per ounce. The same spoon weighing 1.6 oz. Troy, with silver at \$1.15 per ounce, costs of sterling silver only \$1.89. The actual silver in the spoon is 1.65 oz., less 20% alloy, equal to 1.32 oz.; value, at 83 cts., \$1.09. On the white metal of the triple-plated tablespoon there is deposited only 1.12 oz. of silver, which, considering the cost of separation, has intrinsically no value, and which, after 10 years' of service, begins to wear from the surfaces most exposed to abrasion. In buying, therefore, tablespoons to-day of plated ware, we pay \$1.20 for the use of an article for say 10 years. In buying a similar spoon of sterling silver we buy an article containing metal of the intrinsic value of \$1.09 for \$1.89. At the end of the 10 years, when we assume the plated ware to have become tarnished, and therefore worthless, the silver spoon has lost, say, the same weight that is deposited on the plated ware, or about 8% of its weight, and is worth for its actual silver contents say \$1, but as a spoon it is worth its original value of \$1.89, less 9 cts. for loss in weight of silver, or \$1.80. Is the interest on the difference between what is paid originally for the two spoons greater or less than the value of the silver spoon at the end of the 10-year period?

The result answers the question whether it is actually economical to buy silver in preference to plated ware. The difference in the cost of the spoon to-day is 69 cts., which deposited in a saving bank which

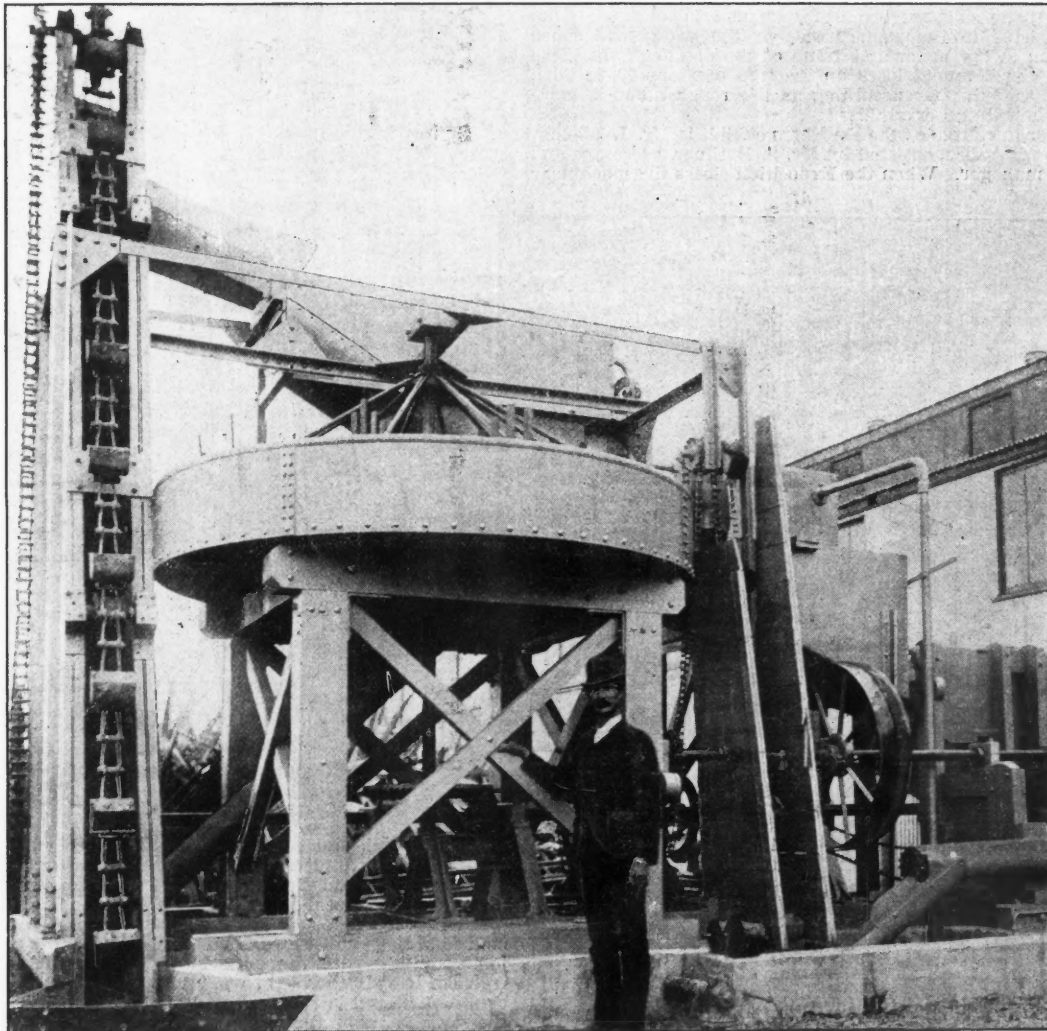
gives 4% compound interest, would, at the end of 10 years, yield \$1.01, or exactly the value of the silver in the sterling spoon, but 79 cts. less than the value of the spoon as a spoon. When the rate of interest was higher, and the difference between the value of manufactured and unmanufactured silver greater than at present, the balance of advantage was on the side of plated ware, as it still is if we estimate manufactured silver at \$1.60 instead of \$1.15 per ounce, for at that price our tablespoon costs \$2.64 instead of \$1.89, and the difference in the cost between it and the plated spoon is \$1.44, which at the end of 10 years would increase to \$2.09, or 37 cts. more than the value of the old spoon. It would seem, therefore, that apart from the considerations of risk and of taste, it is more economical to buy plated ware than silver, if silver sells at \$1.60 per ounce, and more economical to buy sterling silver if it sells at \$1.15 per ounce. The risk, of course, is a factor in most peoples' decisions, but so is the satisfaction of owning, and displaying on your table, silver with the sterling stamp. The gratification of our vanity may be considered as an offset to our fears, and the determining condition is then reduced to one of economy.

The figures quoted from the mint reports would seem to contradict

MINING AT THE COLUMBIAN EXPOSITION.

Specially Reported for the Engineering and Mining Journal.
THE SOUTH AFRICAN DIAMOND EXHIBIT.

The exhibit of the De Beers Consolidated Mining Company, of South Africa, is now almost ready. An immense rotary diamond washing machine, shown in the accompanying engraving, occupies a considerable portion of the space; it is capable of treating 400 loads of gravel per day. The ore or gravel is crushed to a size rather larger than the largest diamonds, and then passed into a cradle where the dirt is washed away. A force of Zulus now guards 1,250 sacks piled up near the Sixty-fourth street entrance to Jackson Park. About this is a circular board fence with electric wires so arranged that a touch will sound an alarm gong. No estimate of the value of these sacks can prove correct. From the inclosure to the Mines Building, a distance of 1,500 ft., a wire rope tramway has been erected by the Trenton Iron Company, of Trenton, N. J. Over this the iron buckets will take the ore to the Mines Building where it will be delivered to the De Beers exhibit, and treated in the rotary washing machine, from which it goes



ROTARY DIAMOND WASHING MACHINE, SOUTH AFRICAN EXHIBIT.

the assumption that the arts will use the more the lower the price of silver falls; but, on the other hand, unless the price of the manufactured article declines to a certain point, economic considerations counteract the sentimental, and people will buy plated ware. Let, however, the price of sterling silver sink to that quoted by Shreve & Co. and economic principles combine with the sentimental, and the solid ware will replace the varnished. If we speculate on what the increased use would amount to, we are met by the fact that the 62,600,000 inhabitants of the United States used in the census year only \$9,031,178, equal at the coinage value to about 7,000,000 oz., or only 1 oz. to every 9 of the population. If we assume that one-half of that 7,000,000 oz. or 3,500,000 oz. was deposited, and that 1 oz. of silver covered 12 oz. of plated ware, then 42,000,000 oz. of plated ware entered the market. If one-half of this were replaced by pure silver, 21,000,000 oz. less 20% or 16,800,000 oz., would go into consumption as sterling silver. Add to this the silver which would still be deposited and the 3,500,000 oz. which we assume is used at present in making more costly silverware, and in the manufacture of salts of silver, and we have a total of about 20,000,000 oz. used in the arts, instead of 7,000,000 oz. Let the fate of the Sherman Act be what it may, if we can absorb one-third of all the silver which our mines and works turn out in our households, the necessary silver coinage will absorb the balance and further depression in price need not be feared.

NEW YORK, May 15, 1893.

D.

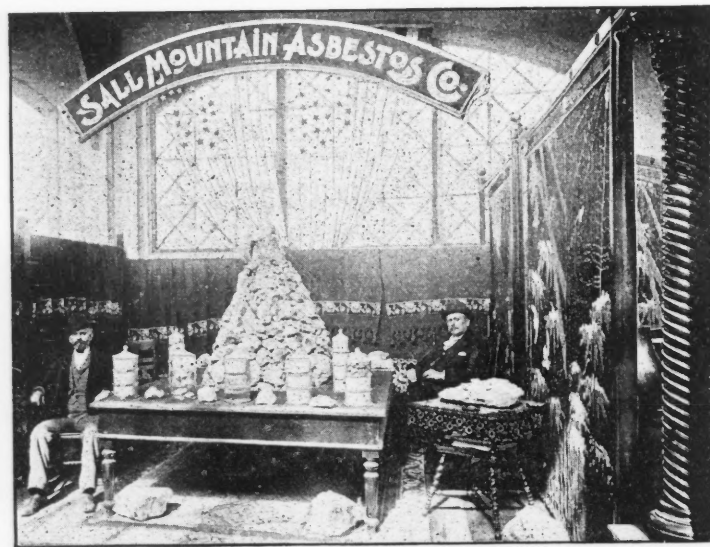
to the sorting table where the rough diamonds are taken out. The diamonds found are delivered to the cleavers, thence to the cutters, and lastly to the polishers; the three last named departments constitute a part of the exhibit made by Tiffany & Co., of New York. This is open to visitors, who can follow the entire process, which is briefly described below.

Having ascertained the run of the crystallization of the stone, and having decided in which direction to cleave it, the cleaver places it in a cement holder consisting of a small stick of strong but flexible wood, on the top of which the cement, a fine mixture of stone and resin, is fixed. This cement is made soft by being held over a flame before the workman is able to adjust the stone into the required position. The cement being cold the cleaver proceeds to make the required incision into the diamond preparatory to cleaving it. This is done by means of a small square copper box in which two round steel pins are strongly fixed, fitting into a larger wooden one screwed to a table. Another diamond, which has already been cleft and which has a very sharp edge, is fixed in a stick similar to the one in which the diamond to be cleft is cemented, and the two diamonds are then pressed together, resting against the two steel pins, and by moving them to and fro the required incision is produced. A blunt steel knife is then introduced into the incision thus made, and being sharply tapped with a small round steel bar causes the diamond to split in the direction required. This process is repeated until the diamond assumes the shape required.

The pieces cleft from the diamond are called "kaps" and "ends," the latter when polished being known as "roses," and are of no little importance. From the cleaver's hands the diamond then goes to the cutters, where a similar device is adopted. Placing the diamond in the cement holder, he likewise makes use of the copper box, allowing the sticks to rest against the iron pins and by moving up and down and rubbing the two stones against each other the large facets are made, to be afterward divided into lesser ones by the polisher. Cutting is divided into two branches, brilliant, and end or rose cutting. The end or rose portion is the triangular piece of the diamond with a flat basis at its point of separation from the stone from which it has been cleft. The cutter brings this to a round shape by rubbing away the points.

The last process is that of polishing, which consists in dividing the large facets into smaller ones, the surface being ground and polished by means of diamond dust, obtained in the two previous processes, mixed with oil and spread upon an iron disc or plate which is turned at the rate of 2,000 revolutions a minute. The diamond, which has been fixed by means of solder into a small copper cup, is pressed upon the revolving disc, and in this way the various facets are made and polished, the position of the stone being altered in the cup for the preparation of each facet until the stone assumes the shape and brilliancy required; the slightest error in judgment in designing the shape, or lack of skill in the performance of the work, will cause serious depreciation in the luster and value of the diamond. In these various processes the diamond loses an average of from 50 to 60%, varying, however, very largely according as the rough stone is more or less perfectly shaped and crystallized.

The commissioner in charge of the De Beers exhibit is Mr. J. Wiener, of Cape Town, South Africa, assisted by Mr. S. Berliner, secretary and Mr. J. W. Cardill, manager. When the Exposition closes the machinery



ASBESTOS EXHIBIT FROM SALL MOUNTAIN, GEORGIA.

and whatever diamonds that are found will be sent back to South Africa, as the ore is held in bond by the Custom House authorities.

SOME SPECIAL EXHIBITS.

The United States National Museum, Washington, has some very beautiful specimens of minerals in the west gallery of the Mines and Mining Building. One of the most interesting of these is a small vial partially filled with placer gold, and bearing the following inscription: "This vial contains the first gold discovered in California. It was found by Jas. W. Marshall on the morning of January 19th, 1848, in tail race, 200 ft. below Sutter's mill, in the Coloma District."

A private collection of minerals representing the resources of the State of California and belonging to Mr. John Hatch, of San Francisco, occupies a space of 100 ft. in the west gallery. Mr. Hatch, who displays the collection entirely at his own expense, has for the past 25 years been making collections of California minerals, until now he has fully 4,000 specimens, forming an attractive display and an interesting study. Some beautiful specimens of free gold and silver ores are included. This collection may be studied to advantage in connection with the State exhibit on the floor below.

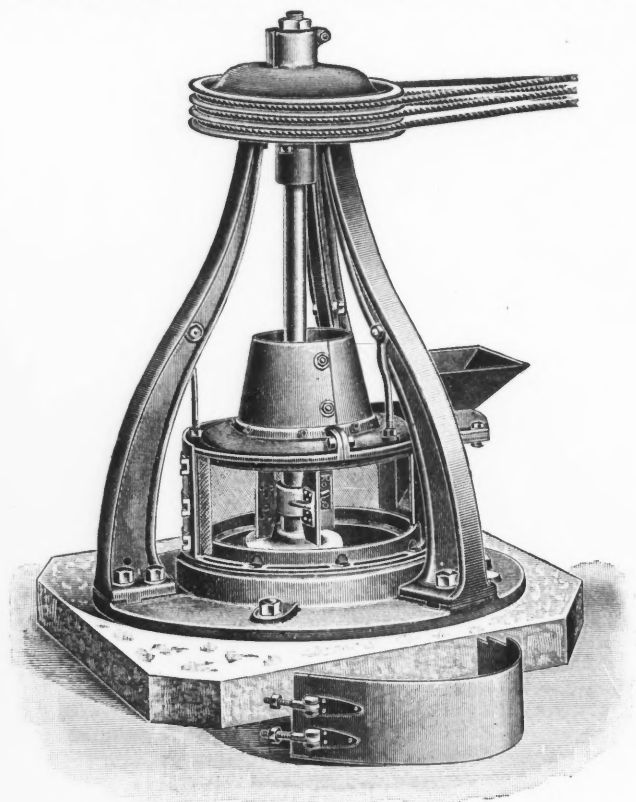
The accompanying illustration shows the exhibit of the Sall Mountain Asbestos Company, of Blue Ridge, White County, Georgia, which occupies a space of 100 sq. ft. with fine specimens of asbestos from its mines. The property of this company occupies 250 acres in the foot hills of the Blue Ridge Mountains. The formation in which the asbestos rock occurs is clearly Laurentian, and has a trend to the southeast with a dip of 55° to 60° to the north. The formation is very regular and clearly defined for nearly 35 miles and resembles much the formation in the Province of Quebec, Canada, in which asbestos, mica and apatite occur. The rocks with which the Sall Mountain asbestos occurs are granite, gneiss and soapstone. The asbestos body outcrops boldly near the center of the property east and west and north and south, the exposure showing a length of from 600 to 700 ft. and a width of from 40 to 50 ft. with scarcely any covering. One place shows a mass exposed fully 150 ft. long by 60 wide, from which the company has mined nearly 70 tons. From this point or across the asbestos body 300 ft. south pits have been sunk in the drift or covering, which have been bottomed in asbestos of the same quality, showing that the de-

posit is at least 300 ft. wide. The asbestos mined by this company when ground is used in the manufacture of building materials, coverings for steel beams, boiler and pipe covering. Experiments are now being made with this product in the manufacture of paper, and so far very good results have been obtained.

SOME MACHINERY EXHIBITS.

The Bradley Fertilizer Company, of Boston, Mass., exhibits two Griffin mills for pulverizing, in the Mines and Mining Building. These mills are of the very latest pattern, and several recent improvements are noticeable in the details of the construction.

One of the mills will grind ores of various kinds by the wet process. The other will be shown working in the dry process cements, phosphates, etc., while a smaller mill, arranged for a rope drive, is also shown. The illustrations show the outline of the dry pulverizer in dotted lines, with the working parts in full lines; also the mill as arranged for rope drive. Heretofore in mills employing the principle of rolls running within and against a ring or die the roll has been propelled by being pushed around by drivers, or carried on journals



THE GRIFFIN SMALL PULVERIZING MILL.

within the roll, and the friction has involved excessive wear. In the Griffin mill this difficulty is overcome by positively revolving the roll on its own axis and giving it freedom to swing outward against the die by use of a universal joint. The centrifugal force holds the roll in contact with the ring or die against which it runs. The roll is fixed rigidly on a solid shaft suspended from a pulley above by means of a universal joint rotating with the pulley, the joint giving the shaft and roll freedom to swing outward when in operation, pressing against the ring or die. The roll is revolved within the die in the same direction that the shaft is driven, but when coming in contact with the die it travels around it in the opposite direction from that in which the roll is revolving with the shaft, thus giving the mill two direct actions on the material to be ground. There is a pressure by centrifugal force estimated at 6,000 lbs. The result of this peculiar roll movement is the production of a fine, uniform product, every particle of which is fractured instead of being smoothly ground, as in ballstone and other mills. It is claimed that this granulation of products makes the mill especially suitable for reducing ores, as the product is in the best possible condition for either amalgamation or concentration. Mr. E. C. Griffin is in charge of the exhibit, which is a very interesting one.

The Jeffrey Manufacturing Company, Columbus, O., has an exhibit covering some 1,500 sq. ft. of floor-space, in which a great variety of mining machinery is shown. The company has coal cutters working both by compressed air and electricity and has arranged an artificial coal bank, so that the operation of the machines in actual service can be illustrated. The Exposition catalogue issued by this company shows that all the requisites for the equipment of a coal mine are present, including coal cutters, drills, mine trucks, pumps, ventilating fans, hoisting machinery and complete electric plants for all mine purposes; also outside machinery, such as engines, coal washers, hoists and dippers, screens, storage machinery, engines and boilers. The electric plant includes locomotives and mine pumps of several patterns.

Large Steel Plates.—Some of the largest steel plates ever made in England have just been turned out at the works of the Consett Iron Company, Durham. They measure 60 ft. 2 in. in length, 50 in. in width, and 0.55 in. in thickness; and they are to be used in the construction of several large cattle-ships which are being built at West Hartlepool.

MINERALS IN THE RUSSIAN CAUCASUS.

The petroleum wells at Balachari, Saburchi and Bibi-Abab produced 5,491,970 metric tons of crude oil during the year 1892, or at the average daily rate of 15,000 tons.

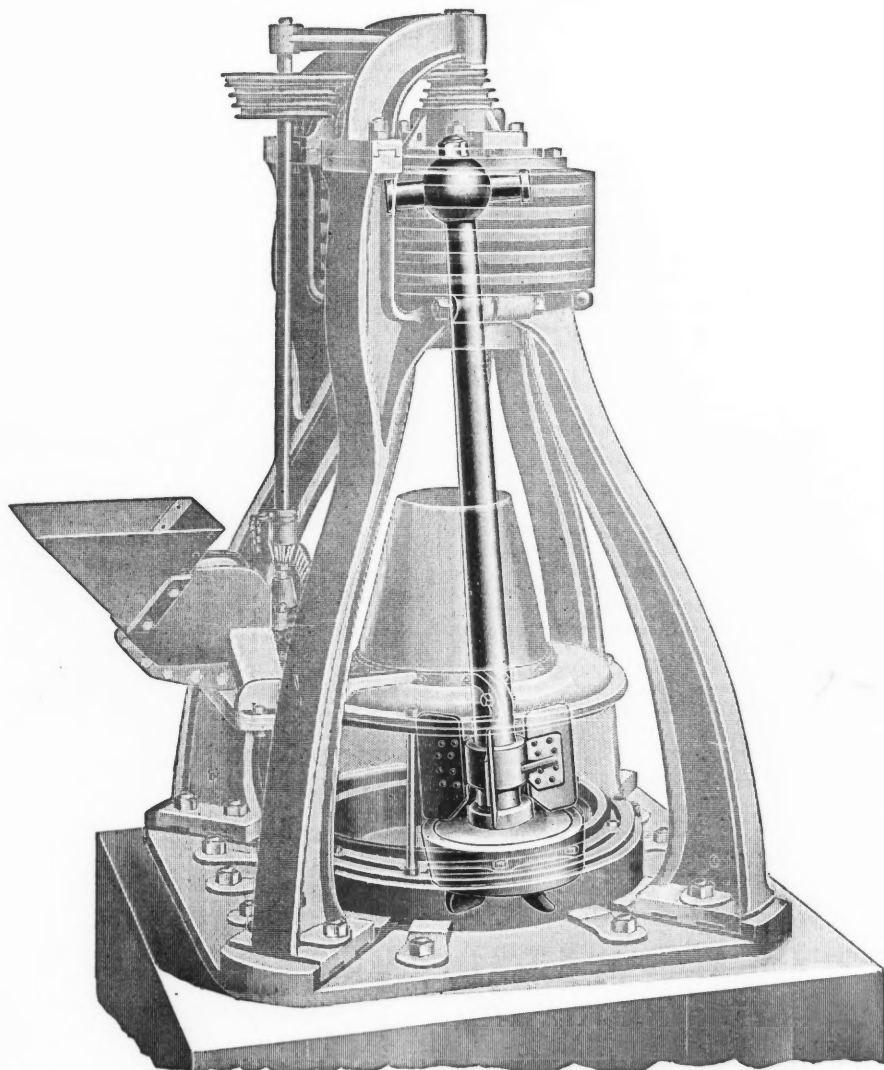
The output during the first half of the year exceeded that of the second half by 110,088 tons; in March several very productive wells struck oil, those on the Apsheron peninsula reaching the enormous output of 2,000,000 poods or 32,258 tons per day; this rate of production has never been attained since, nor did the great flow last for any length of time. The outbreak of cholera was the cause of small production in June, July and August. Altogether there were on December 31st 299 wells in operation; 150 old wells, temporarily stopped, were being cleaned and repaired before recommencing, and 81 new wells were being drilled.

The total shipments from Batoum amounted to 22,367 tons of crude petroleum, 86,542 lubricating oil, and 822,419 illuminating oil, making a total of 931,328 tons in 1892, as against 867,665 in 1891, being an increase of 63,663 tons. The value of the exports of petroleum in 1892

paid for this ore at the seaboard is 40 copecks or 20 cents per pood, or about cost.

From the port of Batoum 33,790 tons of manganiferous iron ore, valued at \$454,305, were exported during the year 1892; of this quantity 26,420 tons, valued at \$310,330, went to the United States. During the same year the exports from Poti amounted to 128,500 tons, valued at \$1,556,250, which would have been much larger if better accommodations for loading existed. The ore now has to be put on board the steamers in the outer roads from lighters and barges on account of insufficient depth of water in the harbor. The great increase in the production of manganiferous iron ore in the Caucasus is shown by the fact that in 1888 the exports amounted to 48,653 tons, and in 1892 to 162,290 tons.

Petroleum in France.—Borings recently made at Pechelbronn, where there is considerable bitumen, are said to have shown the existence of petroleum; it is also known to exist at Gabian in Herault, where it has long been used in pharmaceutical preparations, and also at Fontaine-Ardente. Borings at these places were followed by the escape of



THE GRIFFIN PULVERIZING MILL

from Batoum amounted to \$14,848,350. The total quantity of illuminating oil shipped to ports east of the Suez Canal was 309,687 tons, of which 154,217 tons went to India and the rest to Cochin China, China, Japan, Java and Manila, and of this quantity 304,977 tons were carried in cases and the balance of 4,710 tons was carried in tank steamers.

The production and export of manganiferous iron ore in the Caucasus is steadily increasing, and will no doubt assume large proportions as soon as the trans-Caucasian railroad, now nearly completed, is opened for traffic to Chiatur. The Russian government has shown great concern in the welfare of the mining industry of the Caucasus, and measures have been adopted for the immediate improvement of the existing tramways in the mining section of the sub-district of Sharopan. Macadamized roads are being constructed which will make the mines more accessible and which will enable the mineowners to deliver the ore at lower rates at Kiveil, which is about 50 miles distant from the mines on the trans-Caucasian road, and in direct communication with the ports of Batoum and Poti, from which the ore is expected. At present the average cost of ore at mines is 4 cents per pood (36 lbs.); transportation to Kivril costs 12½ cents; commissions and freight from Kivril 3½ cents, making a total of 20 cents delivered at Batoum; the improvements mentioned will reduce the cost of hauling to Kivril to 2½ cents, reducing the total cost one-half. The average f. o. b. price

gaseous hydrocarbons, similar to natural gas. In 1892 M. de Clercy made borings at Limagne d'Auvergne, but, although much bitumen was found, even at a depth of 200 metres, no oil was struck. The same engineer undertook borings at Pont-Battu, and when drill obtained a depth of 195 metres, a flowing well of water and oil was struck. At a depth of 265 metres, a great quantity of gas was given off.

The "Canals" of Mars.—A new theory in relation to the so-called canals on the planet Mars is submitted by Dr. A. Tooska, in "Die Natur." It is that they are simply rifts in the crust of that planet due to collisions with one-time satellites. To support this theory he says that one of the present satellites of Mars, "Phoebus," revolves around that planet at a distance of only 800 miles, and is within the limit where the attraction of gravitation is in equilibrium with the centrifugal force. It is approaching Mars at an ever accelerating rate, and in a few decades, perhaps, it may strike the planet at a lower angle, and running along its surface, make another "canal." It would form two parallel elevated crests, which after cooling will be covered with snow and ice. Under the great heat of contact ice would be melted, and the furrow filled with water. This water would again freeze and present the bright line, relieved by the shadows of the high mountains, familiar to observers. Mars, in its eccentric orbit, passes through the orbits of numerous other planetoid bodies, and may have had frequent collisions.

THE ULTIMATE COMPOSITION OF SOME ALABAMA COALS AND COKE.*

By Dr. William B. Phillips.

The coals of special interest are Pratt mines, the Brookwood and Milldale seams at Brookwood, the Woodstock and Underwood seams at Blocton, the Blue Creek, the Coalburg and the Wadsworth seams at Helena. Proximate and ultimate analyses are given of these coals, and, with the exception of the Wadsworth seam, of the coke made from them. In addition analyses of some 15 or 16 other Alabama coals and lignites are also given. So far as we are aware this is the first attempt that has been made to give the ultimate composition of standard Alabama coals and cokes, and to inquire into the crushing strain of the coke furnished to the blast furnaces. In view of the importance of the subject the results are given herewith in relation to such coals and cokes as come largely into market, giving the proximate and ultimate composition and the crushing strain tests on the cokes:

COMPOSITION OF ALABAMA COALS.

Number.	Proximate.				Ultimate.				
	Vol. and Combust. Matter.	Fixed Carbon.	Carbon.	Hydrogen.	Oxygen.	Nitrogen.	Sulphur.	Asb.	Moisture.
1,217	31.30	69.50	73.23	7.98	11.92	1.07	0.89	3.50	1.70
1,218	33.15	63.20	75.82	10.52	7.51	1.73	1.07	2.10	1.35
1,221	27.80	58.70	72.45	10.28	1.69	0.40	1.65	11.90	1.60
1,222	34.80	69.60	72.75	8.61	11.12	1.48	1.44	2.65	1.55
1,223	35.65	57.30	70.82	10.19	9.95	1.31	0.68	5.5	1.80
1,225	31.55	61.95	75.05	9.91	8.95	1.62	0.97	2.35	1.15
1,229	30.50	66.0	73.93	10.50	9.57	1.62	1.15	2.0	1.00
1,231	35.80	69.90	72.68	10.77	9.83	1.39	1.03	2.80	1.0
1,235	32.55	65.37	74.59	10.58	9.48	1.31	1.3	1.90	0.82
1,234	30.15	52.90	60.97	10.70	9.00	1.25	1.72	6.30	0.65

The explanation of the numbers under Coals is as follows: 1,217, Wadsworth seam, Helena, Shelby County. The seam is fiery, but no serious accidents have occurred. 1,218, Pratt seam, Pratt mines, Jefferson County. This is used on a large scale for making coke in beehive ovens at Pratt mines and Thomas, and for a gas coal at Birmingham. The yield of gas is 8,000 cu. ft. and of tar 13 gals. per ton of coal; compare also No. 1,225, Tennessee Coal and Iron Company, and Pioneer Company, 1,221, Brookwood seam, Brookwood, Tuscaloosa County; used on large scale for making coke in beehive ovens in connection with No. 1,220. 1,222, Woodstock seam, Blocton, Bibb County; used with No. 1,223 on a large scale for making coke in beehive ovens, and also as a gas coal at Mobile; Cahaba Coal Mining Company. 1,223, Underwood seam, Blocton; see also No. 1,222. 1,225, Pratt mines coal; used as gas coal at Birmingham; see also No. 1,218. 1,229, Milldale seam, Brookwood; see also No. 1,221. 1,231, Blue Creek coal, Jefferson County; used on a large scale for making coke in beehive ovens at Bessemer, De Bardeleben County. 1,234, used by Mobile Gas Light and Coke Company, as a gas coal. It was said to come from the Cahaba field, but the seam was not stated. The yield of gas is 8,000 cu. ft. and of tar 10 gals. per ton of coal. 1,238, from Coalburg, Jefferson County; used on a large scale for making coke in beehive and Thomas ovens; Sloss Iron and Steel Company:

COMPOSITION OF ALABAMA COKES.

Number.	Proximate.				Ultimate.					Crushing Strain, in Pounds per square inch.
	Vol. and Combust. Matter.	Fixed Carbon.	Carbon.	Hydrogen.	Oxygen.	Nitrogen.	Sulphur.	Asb.	Moisture.	
1,204	0.91	94.90	84.87	5.52	4.62	Trace	0.79	3.99	0.30	Cracked 400, broke 1,000.
1,206	1.10	97.00	85.84	4.93	6.46	"	0.90	1.80	0.10	Broke suddenly at 944.
1,219	1.40	89.80	77.86	7.10	5.12	"	0.82	7.39	0.90	Cracked 350, broke 510.
1,221	0.85	85.45	74.61	5.67	3.97	"	1.35	13.45	0.25	Broke at 390.
1,224	0.59	93.30	83.18	6.43	3.14	"	1.05	6.10	0.10	Broke suddenly at 445.
1,225	0.70	93.30	81.27	4.61	3.79	"	1.23	5.90	0.20	Broke at 690.
1,232	0.70	86.00	76.23	6.18	3.06	"	1.23	12.90	1.10	Cracked 483, broke 750.
1,233	0.90	87.25	78.27	7.38	1.51	"	0.99	11.80	0.05	Cracked 720, broke 1,100.
1,235	3.25	83.05	71.74	7.49	5.71	"	1.45	10.80	2.90	Broke at 700.
1,239	2.55	81.15	75.25	4.25	1.90	"	2.21	15.60	0.70	Broke suddenly 550.
1,244	1.10	82.15	69.18	5.57	7.07	"	1.43	16.55	0.20	Broke suddenly 32.
1,245	2.50	86.80	76.63	3.56	7.61	"	1.47	7.65	3.05	Broke 515.
1,246	1.00	82.10	74.25	4.70	5.66	"	1.49	16.60	0.30	Broke 800.
1,329	3.10	86.45	80.32	5.65	2.65	"	0.93	9.55	0.90	Broke 485.

The explanation of the numbers under Cokes is as follows: 1,204, Black Creek, Jefferson County; not made commercially. 1,206, Berry Mountain, Jefferson County; not made commercially. 1,219, Pratt coke. 1,220, Black ends of Pratt coke. 1,224, Cahaba coke, Blocton. 1,226, Gas carbon, Birmingham. 1,232, De Bardeleben, 48-hour. 1,233, De Bardeleben, 72-hour. 1,235, Gas carbon, Mobile. 1,239, Coalburg, Thomas oven. 1,244, Standard, Brookwood seam. 1,245, Standard, Milldale seam. 1,246, Standard, mixture of Brookwood and Milldale seams. 1,329, Mary Lee, Jefferson County. Coke is now made of washed coal by the Standard Coal and Coke Company, at Brookwood, and by the Mary Coal and Railway Company, at Lewisburg, near Birmingham. It is probable that the quality of the coke made by these companies is now better than that represented by these analyses.

The Cyanide Process in a Tropical Climate.—It is said that in South Africa, in the many heaps of tailings to be worked by the cyanide process, the presence of humic acid, which is the product of the decomposition of vegetation, causes reaction on the cyanide solution. Frequent washing is resorted to, but, although this is successful, it is expensive.

* Article in the "Proceedings of the Alabama Industrial and Scientific Society," Vol. II., 1892; continued from Vol. I., No. 1, 1891.

THE COPPER MINES OF ARIZONA.

While Arizona stands third as a copper producer among the States and Territories of the United States, coming at a considerable distance after Montana and Michigan, its production is large enough to make it an important factor. The production of the several mines of the Territory for the four years 1889-1892, inclusive, is shown in the following table from the "Mineral Industry for 1892;" the complete table in that work shows the production from 1885:

COPPER PRODUCTION OF ARIZONA.

Name of mine.	(Pounds of fine copper.)			
	1889.	1890.	1891.	1892.
Arizona Copper	7,600,000	4,662,281	5,910,044	6,061,034
Buffalo		398,849	2,302,765	
Commercial Mining Company				279,451
Copper Queen	9,108,900	9,031,680	10,203,683	9,896,763
Detroit	5,076,899	4,777,814	4,194,672	2,878,563
Holbrook & Cave	2,561,144	2,925,418	2,751,445	3,023,605
Old Dominion	5,923,289	7,491,606	6,982,306	7,666,274
United Verde	1,923,788	5,475,573	6,916,956	8,284,239
Other mines	430,939	136,779	408,129	
Total pounds	32,933,000	34,900,000	39,700,000	38,000,000
Long tons	14,703	15,581	17,723	16,964
Metric tons	14,912	15,835	18,003	17,241

The general and very comprehensive tables of copper production given in the same work show that for the four years given in the table the production of Arizona bore the following proportion to the total output of the United States: 13.8% in 1889; 13.5% in 1890; 13.9% in 1891, and 11.7% in 1892. The cause of the reduction in the last-named year is explained in the "Mineral Industry" as follows: "The great mines of Arizona are, with a few exceptions, controlled by a single interest, and this is noted for its conservative and business-like policy. Having an abiding faith in the vastness of the future demand for copper, and an equally clear appreciation of the fact that all high-grade ores are limited in depth and that it is unwise to work out valuable property when prices for the product are so low as to leave no profit, they have reduced the output of their mines during the past year."

As to the present condition of the mines of the territory, and especially those about Clifton, some interesting information is given below which has been furnished us by Mr. James Colquhoun, general superintendent of the Arizona Copper Company.

Longfellow Field.—In this field oxidized ores occur in magnesian limestone and dike porphyry contact. In the Longfellow mine the main vein goes down nearly vertically with a slight dip to the west. The general strike is north and south. In the Detroit and other mines in the same field the veins lie almost horizontally, like a coal seam. The principal ores are: 1. Blue carbonate of copper (azurite) in wad or manganese ore; this is the principal ore of the entire field. 2. Red oxide ore, which is essentially a fine fluxing iron ore, carrying red oxide of copper (cuprite) disseminated in fine streaks and crystals. 3. Aluminous ore, which may be described as kaolinized porphyry, saturated with cuprite. It is very common, is lower in grade than the other ores, and is troublesome in smelting. 4. Silicate of copper, which is not plentiful, and is found always near the surface.

Sulphide ores also are found in abundance in the same field, almost invariably in the porphyry, either inclosed within a dike or lying flat in an overflow. In depth the oxidized ores change into sulphides. In the Longfellow this change occurs at 340 ft. The sulphides vary in character considerably, running from 2% to 40% in copper and averaging about 10%.

The greatest depth so far attained in the mines of the Longfellow field is 500 ft.; but the ground is practically virgin below the 300 ft. level. The principal properties of the Arizona Copper Company and of the Detroit Copper Company are situated in this field.

Metcalf Field.—The Metcalf mines, or the main portion of them, cover a hill of porphyry which rests on quartzite. The ores occur on and near the surface. So far, they have not been found extending to a greater depth than 100 ft. The ore, originally a sulphide, has been thoroughly oxidized by surface action. While streaks of rich ore run through the mass, the great bulk of the ore is low grade, fit only for concentrating and leaching.

The ores of the Detroit Copper Company are reduced at that company's reduction works at Morenci. A tramway of 20-in. gauge connects the works with its other mines. The plant consists of four water-jacketed blast furnaces, having a nominal daily capacity of 280 tons. Connected with this is a concentrating plant which has a capacity of 70 tons per day. This company is working only one furnace at the present time and its copper production is not more than half of what it was formerly.

The plant of the Arizona Copper Company situated at Clifton consists of four water-jacketed blast furnaces, and a concentrating plant having a capacity of 150 tons per day. A 20-in. gauge railroad, 8 miles long, connects the reduction works with the mines, the nearest of which, the Longfellow, is situated on Chase Creek, four miles from Clifton. This company is running three stacks constantly and is producing at the rate of 320 tons of copper per month.

For the treatment of the tailings from the low grade ores of the Metcalf a leaching plant is now in course of erection. It will have a capacity of 100 tons of tailings per day, and will yield 120 tons of copper per month. The process consists simply of the treatment of the low grade tailings with dilute sulphuric acid and the precipitation of the copper from the resultant solution by scrap iron. In this way an extraction equal to 90% is readily obtained.

As to the prospects of Arizona copper mines it may be said that, with the possible exception of the United Verde, it may be accepted as a fact that the cream has been taken from the rich surface ores of Arizona. A lower yield is now the invariable experience. This has been compensated for to some extent by the introduction of improvements in the plants and by the use of more economical methods of handling ores. The present price of copper leaves only the slenderest margin of profit to most of the companies. The writer expects that

Arizona mines will take on a new lease of life with the introduction of leaching.

The Arizona Copper Company is the pioneer in this department, but if the process it has adopted should prove successful the introduction of an electrolytic method for the treatment of the liquors will follow. The other companies will gradually fall into line, and, if all goes well, an era of greater and more enduring prosperity will be entered upon.

THE PEARCE TURRET FURNACE.

This furnace, the invention of Mr. Richard Pearce, for many years manager of the Boston & Colorado Smelter at Argo, Colo., has proved a success wherever it has been introduced, it is said, and, it is claimed by the manufacturers, offers advantages over other mechanical furnaces of the reverberatory type, such as the Brown-Allen improved O'Harra furnace described in our issue of May 20th. As will be seen in the sectional drawings accompanying this article the furnace consists of an ordinary reverberatory hearth built in a circular form.

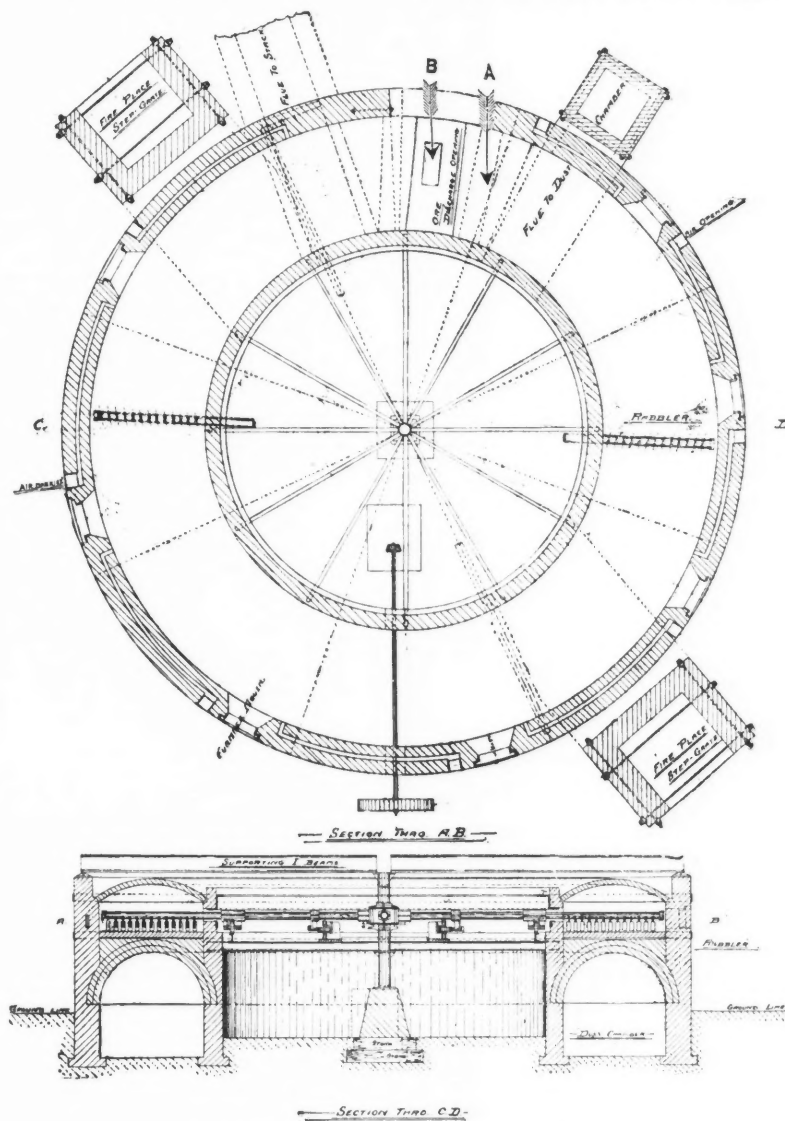
furnace varies with the ore, and especially with the percentage of contents in sulphur desired in the roasted ore. At Argo the capacity of a 36 ft. furnace is about 22 tons in 24 hours, finishing the product to from 5 to 7% sulphur, the original ore containing about 30%.

An experiment was recently made in dead roasting Gilpin County concentrates, carrying 45% sulphur and 6% moisture, in which nine tons were roasted absolutely sweet, no traces of sulphur being discovered in the roasted pulp.

The cost of roasting at Argo shows a saving of \$1 per ton compared with the reverberatory, and the saving between the Pearce turret and the Brown-Allen Improved O'Harra is one-third in favor of the former. A portion of this low cost is due to the simplicity of construction and infrequency of repairs, as well as the small amount of labor required, one man being sufficient for all purposes for each furnace.

The furnace is said to be applicable to chloridizing roasting or to drying or cooling ore.

The cost of a 36-ft. furnace exclusive of the motive power, line shaft or belting, but inclusive of driving gear and all other iron work, is \$6,000. The power required is approximately 2½ H. P. The Stearns-



THE "PEARCE" TURRET ROASTING FURNACE.

In the circle of which the brickwork forms the perimeter is placed the iron work and driving gear. Here is a central vertical column with four hollow arms, or pipes extending horizontally and radially and projecting through a slot in the side of the furnace to the reverberatory hearth. These arms are joined to the rabble blades which traverse the hearth, stirring the ore in their passage. Through the hollow pipes air is forced which is discharged against the rabble blades, performing the double duty of cooling the iron work and of furnishing heated air for the oxidation of the ore. To allow of the continuous slot in the inner wall, that side of the arch is supported from I-beams which pass over the top of the furnace.

The ore is fed mechanically at A on the horizontal section, at any speed desired, and is pushed along the hearth at any desired speed, and is finally discharged automatically at B. Thus the operation is perfectly automatic, and both the quantity and thoroughness of the roast can be varied according to circumstances. As shown in the section, two fireplaces are used, but if desired more may be built and located according to the result to be arrived at. The space under the hearth is utilized as a dust chamber.

One of these furnaces, the original, has been working at the Argo works for over a year, and three others since June, 1892. Four others have been in operation at the Colorado Smelting and Mining Company's works at Butte, Mont., for six months. The capacity of the

Roger Manufacturing Company, of Denver, Colo., has secured the right of manufacture and sale for the greater portion of the United States, and Fraser & Chalmers, of Chicago, the balance.

A New Process of Making Steel.—A new steelmaking process is reported to have been lately patented by the Phoenix Works, Ruhrort, Westphalia, and the Dudlingen Iron Works, Luxemburg. These works have been experimenting for years with the object of finding out an improved method of introducing the necessary carbon into the molten metal bath. The problem is now said to have been solved by mixing pulverized anthracite and lime water together, and forming the mass into briquettes under great pressure; these briquettes are then brought into contact with the molten metal, and in this way the desired proportion of carbon for the formation of steel of various tempers and qualities can be introduced into the converter. The Burbacher Huetten, as well as the Dudlingen Works, has been practically working the process for some time.

Pig Iron Production in Belgium.—On May 1st there were 25 furnaces in blast in Belgium and 22 out of blast. The production of pig iron in April was 62,250 tons; for the four months ending April 30th it was 252,540 tons, against 244,145 tons in the corresponding period of 1892.

ABSTRACTS OF OFFICIAL REPORTS.

EL CALLAO MINING COMPANY, VENEZUELA.

If the opinion of Superintendent Geo. E. Webber, Jr., is to be trusted, and we see no reason to doubt it, the end of this mine, the greatest in Venezuela, is not far distant. In the recently issued report for 1892 Mr. Webber says: "The outlook at El Callao is extremely bad, in fact, never in the history of the mine has the situation been so critical. The thinness and poverty of the vein in the northwest quarter (No. 6 shaft), together with the discouraging outlook in the lower south and southwest parts, indicates but one thing—a suspension of operations in these directions within a few months. Having in view this situation resort has been made to the few available pillars yet standing in the abandoned areas north and east of No. 6 shaft. The extraction of these, however, while increasing the general grade of the ore considerably, will not prolong operations to any extent."

The net ore receipts, equal to the amount crushed, for the year ending December 31st, 1892, were 52,823 tons, of which 18,060 tons were raised from No. 5 shaft and 37,763 tons from No. 6 shaft.

The ore raised shows a decrease of 6,461 tons as compared with that raised in 1891, owing, it is said, to a stoppage of nearly two months during July and August consequent upon the late revolution and to heavy floods; and to the suspension of operations at No. 5 shaft in November.

The total bullion receipts from December 20th, 1891, to December 16th, 1892, were 31,931.68 oz., of which 31,397.68 oz. were from 52,910 tons of ore crushed and 534 oz. were skinnings. The average yield per ton crushed was 59 oz., or 70 including skinnings. The total expenditure for the year amounted to \$550,896, as follows: Mining, \$442,469, or \$8.37 per ton; milling, \$65,720, or \$1.24 per ton; taxes and conveyance of bullion and coin, \$22,501, or \$0.42 per ton, and sinking No. 7 shaft, \$20,204, or \$0.38 per ton; total, per ton, \$10.42. The milling was the cheapest ever done at this mine. There was also expended the sum of \$52,534 in reopening and developing the Colombia Mining Company's mine at Caratol. Compared with 1891, total expenses show a decrease of \$43,167, but there was an increase of \$0.40 in the tonnage cost. The cost per ton varied considerably throughout the year, averaging \$9.70 for the first six months and \$11.51 for the second six months. This great difference is accounted for by the embargo laid on mine explosions and the conscription of men and animals during the revolution, which led to a suspension of work. The superintendent estimates the suspension, and consequent influx of water, to have cost the company not less than \$40,000. Near the close of the year a reduction in expenses was made by closing the work at No. 5 shaft and by a general reduction of wages of nearly 10%.

The principal work during the year was in the lower southwest quarter, No. 6 shaft following the vein formation on its rising inclination. Stopping was confined to the area between the old No. 1 south stopes and the 6½ level, the vein being found quite regular although lumpy. Early in the year the hope was entertained that the formation might develop with depth, but such was not the case. Some stopping was also done in the No. 7 south workings, from which a fair output was obtained, but at the close of the year operations were reduced owing to the failure of the vein to open out. At No. 5 shaft on the north and northwest, considerable ore was taken out, but although conditions for cheap working were favorable no profit was made, owing to the continuous pinching of the vein. In October the ore became very low grade, and in the following month, work was abandoned at this shaft, the vein not being over 7 in. wide. The amount of exploration and development was very small as compared with former years. Owing to the favorable appearance of the lower southwest workings, taken in connection with the fact that in this direction laid the future of the mine, a new shaft was commenced 1,420 ft. west of No. 6; but work on it was discontinued after a depth of 195 ft. had been reached in consequence of the discouraging outlook. It is estimated that the shaft must be sunk 155 ft. further to cut the vein. The work of reopening the old Caratol mine of the Colombia Mining Company was carried on, but slowly. It was unwatered and No. 1 incline was retimbered. The old shaft was sunk 46 ft., making a total of 243 ft. and a number of levels and drifts were run. The ground opened shows a massive formation of quartz and lode matter whose position confirms the opinion that it is a continuation of the Caratol or Nueva Providencia lode, but as yet it has not shown a value of over \$5 per ton. During the year there were crushed 620 tons of ore from this mine, yielding 487 oz. of gold, or 78 oz. per ton. It is estimated from old plans that there are about 6,000 tons of ore on the old No. 1 level, but the failure to develop anything of value on No. 2 level "creates some doubts as to the future of the mine."

The cost of mining in detail per ton was as follows, the exchange being calculated at 5:20 francs to \$1: Labor, \$3.76; fuel, \$1.52; explosives, \$0.87; supplies, \$0.50; superintendence, etc., \$0.73; actual mining, \$7.38. To this must be added prospecting, \$0.67; improvement, \$0.37; sundries, \$0.41; making a total of \$10.03 per ton. The cost of milling was \$1.20; making a total charge of \$11.23 per ton of ore. The cost here given may be compared with the tables given in "The Mineral Industry for 1892," which show the ton-costs of working ore at this important mine from 1871 to 1891.

In regard to the future work at this mine Superintendent Webber says: "After the pillars are exhausted there seems no alternative but to abandon the lower workings and resume work in the most promising places near the surface, above the angle level north of No. 5 shaft and above the Panama tunnel on the south end." Work at the former of these can be commenced at once, but at the latter a new shaft must be sunk, owing to the caving-in of the old workings. Mr. Webber advises that further explorations be restricted to the No. 7 shaft and the Caratol mine, and that if these be successful that a ten-mile railway between it and the Callao will be built. It must be confessed that the outlook, as shown by the report, is not encouraging.

DRAINING THE OKEFENOKEE SWAMPS.

Written for the Engineering and Mining Journal by W. M. Brewer.

The work of the Suwanee Canal Company in Southeastern Georgia is being performed under the superintendence of Mr. James R. Hall, a member of the Atlanta firm of Hall Brothers, engineers. The Okefenokee swamp comprises 400,000 acres of land situated in the counties of Charlton, Ware, Clinch, and Pierce, of which 100,000 acres are covered with a fine growth of cypress timber. The other varieties of timber found in these swamps are red bay, mahogany bay, satin wood, cedar and pine, the first mentioned often reaching a height of 100 ft. The value of this timber formed the chief reason for the organization of the canal company, and for the most important piece of engineering work at present being carried on anywhere in the South. The proposition is to drain these swamps, and cut a system of canals through the interior connecting with an outlet canal emptying into St. Mary's River which falls into Cumberland Sound, on the coast at the extreme southeast point of Georgia. It is estimated that the timber cut in one year, and which has to be girdled and deadened the season before it is cut to make it float, will pay all the expense of the work up to the time it is taken off. Work has now been going on for a year and a half. In draining, 10 ft. of muck are encountered. For cutting the interior canal, which is to be 40 ft. wide and 8 ft. in depth, a Bucyrus dredge, furnished with a three-yard dipper, is used, and from 200 to 300 ft. is cut a day by one shift. The main canal or outlet, which will be six miles in length in an air line, is being cut by hydraulic power. A porcupine arrow, made by setting iron teeth into a log, is used to loosen the material in the bed of the proposed canal, which is then washed away with water. The excavated material spreads on either side of the cut into ravines. The water for hydraulicking is raised 15 ft. at the rate of 30,000 galls. a minute, by two cyclone pumps stationed at the mouth of the canal. The porcupine arrow is kept in continual motion, the power being furnished by a stationary hoisting engine. By means of an endless wire rope this arrow, which cuts 6 ft. wide, is pulled up and down the bottom of the cut for a distance of 1,000 ft. When completed the water surface in the canal will be 30 ft. wide, with a depth of 10 ft. The fall for the first five miles will be 8 ft. to the mile, with a 50-ft. fall the last mile, to be utilized as a water power for propelling the floating logs. The elevation of the summit of this canal is 30 ft. above the general swamp level, which is 116 ft. above high tide in St. Mary's River. The excavation will be continued to a depth of 50 ft. below the surface, which depth will be increased by the wash, as this outlet canal will be the means of drainage for the entire swamp. The present cost of excavating on this canal is 1½ cents a yard, the cost of excavating with dredge on the interior canal is \$550 a mile. The company undertaking this enterprise is capitalized at \$5,000,000. The length of the interior canals will be increased as required for the conveyance of timber to the main canal.

The Mansfeld Copper Mine, Germany.—The following statement concerning this mine was published in the "Mineral Industry" for 1892: "Outside of Spain the only large producer is Mansfeld, in Germany. Operations were hampered last year by salt water which percolated into the mine from a salt lake between the Saale River and Eisleben, and within the area of the copper-bearing slates. As the mine deepens, the lake waters filter into the workings in increasing quantity. This flow is now in excess of the pumping facilities. As a result the lower and richer levels are closed, and such of the furnaces as are running in two of the smaller establishments are in part fed by poor surface ores. The ultimate remedy, draining the Salziger See by cutting a canal to the Saale River, can be resorted to only after permission from the government and the satisfaction of private claims. As operations to that end have not even been commenced, the output of copper from Mansfeld for the next few years will probably be below that of recent years." Information has just been received from Germany that the Supreme Mining Court at Halle has granted permission to the Mansfeld company to drain the Salziger See, near Oberwoblingen, by pumping. The question of damages to be paid has been referred to another court. The company has not been able to pay any dividends for 1892.

Tin Mining in the Malay Peninsula.—With very few exceptions, the whole of the tin produced in the British protected states is raised by Chinamen, who own and work concessions on, at times, a very large scale, the leading Chinese mine owner of Selangor employing about 5,000 coolies. According to Mr. Henry Louis, in the London "Mining Journal," the tin ore occurs in a layer of heavy sand and gravel, varying from 1 to 15 ft. in thickness, which is overlaid by barren gravel to a depth of between 3 and 80 ft. The stanniferous gravel appears to yield on an average ½% of tin. The Chinese method of working consists in stripping off the barren overburden from a given area, the tools employed being hoes and ironshod crowbars, while their sole means of transporting the excavated material consists of a couple of small baskets slung from either end of a pole, and carried on the shoulders of a coolie, the pair of baskets holding about 70 lbs. weight of gravel. The overburden is sometimes piled up on the surface of neighboring land or more frequently is used to fill up old excavations previously exhausted. When the stanniferous layer is reached this is carried up in the before mentioned baskets to the surface, and there washed in wooden troughs with constant stirring till the lighter, valueless sands are washed away and the heavier tin ore left behind, the process being repeated till the ore is considered sufficiently pure to smelt. It is needless to say that a certain amount of tin ore must be lost in this washing operation. It is extraordinary, says Mr. Louis, that by such means the Chinese can exploit profitably tin deposits at moderate depths, and in some cases even when overlaid by as much as 80 ft. of overburden. This seems to be, however, the limit at which they can work (as they only work open-cast), and, in fact, they rarely go below 60 ft. European efforts in tin mining have so far been mostly failures, while the Chinese have on the other hand been very successful.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

United States Circuit Court of Appeals, Ninth Circuit.

Application for Mineral Patent.

As mineral lands are excluded from the grant, a railroad company is not entitled to any notice of an application for a mineral patent to lands lying within the boundaries of the grant, other than the general notice to all persons who may claim an interest in the land; except that, in case it initiates a contest to determine the character of the land, it is then entitled to personal notice of all subsequent proceedings; and, if it fail to initiate such contest, the question whether the lands are mineral or agricultural becomes a matter solely between the patentee and the government.—Northwestern Pacific Railway Company vs. Cannon.—54 Fed. Rep., 253.

United States Circuit Court of Appeals, Eighth Circuit.

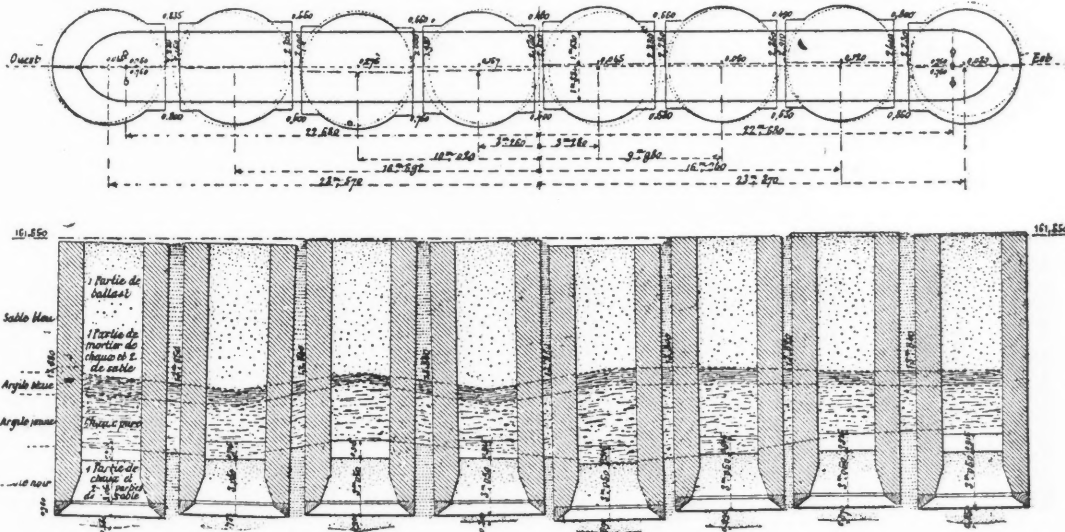
Reservation of Mining Privileges in Sale of Land.

A railway company, having sold land, reserving all coal underneath the surface, also such right of way and other grounds as may be necessary for the working of any coal mines, and for the transportation of coal therefrom, subsequently filed a bill averring that there was a vein of coal on the land of sufficient thickness to pay for working; that the company had a right to enter on the land for the purpose of sinking shafts to extract the coal, but that the purchaser, by force and violence, prevented such entry. The bill prayed an injunction to restrain such interference. The answer denied that there was coal on the land, or that the reservation in the deed authorized the complainant to prospect upon the land, and averred that the complainant's railroad crossed the land over a strip 100 ft. wide, of which complainant owned the land, and whereon shafts could be sunk to remove the coal from the land. The injunction was denied, and the bill dismissed, on

FOUNDATIONS OF THE NADRAI AQUEDUCT, INDIA.

One of the most important of the great works undertaken by the English in connection with the irrigation system of India is the Nadrai aqueduct which carries the Lower Ganges Canal over the Kali-Nadi torrent. The latter is a mountain stream subject to violent fluctuations, so that a large waterway had to be provided. The aqueduct is of masonry throughout, having nine arches of 18.3 metres span. The piers have a heavy weight to sustain, and it was necessary to adopt a method of building the foundations which would give a solid support to the great mass of masonry to be carried. The plan selected was one frequently used in India, where it is not possible to carry the piers down to bedrock, a foundation composed of a row of wells sunk to a depth varying according to the nature of the soil, and filled with concrete or masonry. In the foundations for arches of the Nadrai aqueduct there are under the central pier, which may be taken as an example of the rest, a row of eight wells 6.10 metres in diameter and sunk to a depth of 17 metres below the surface. A ring of brick masonry is built around the outside and carried nearly to the bottom, the remaining space being filled in with concrete. The masonry of the pier rests upon the top of the wells, the outer brick rings in the wells really forming part of the pier. The method described has been used in many large structures with success, providing a good foundation in difficult ground in some cases where other methods are not available, or would be very costly. The method of arranging these wells and the general plan of their construction are shown in the accompanying illustration, which gives a section and plan of the foundations. It may be mentioned that before constructing the pier the central well was tested by a temporary structure containing 1,541 tons of brick in order to decide whether it had been sunk to a sufficient depth to give a solid foundation.

The Nadrai aqueduct required about four years for its construction,



FOUNDATIONS FOR THE NADRAI AQUEDUCT, INDIA.

evidence having been taken, as counsel intended that all material facts should be embraced in the pleadings. On the records, the Appellate Court could not say that the Circuit Court erred in refusing the injunction, but that the decree dismissing the bill upon its merits was erroneous, since it would probably prevent complainant from thereafter asserting the right to enter upon the land in any way for the purpose of mining coal.—Union Pacific Railway Company vs. Harmon.—54 Fed. Rep., 29.

and cost \$196,000. The work was somewhat delayed by floods during its progress.

PATENTS PUBLISHED IN GREAT BRITAIN.

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

WEEK ENDING MAY 24TH, 1893.

- 9,765 of 1892. Steel and Other Metallic Castings. W. E. May, London.
- 10,756 of 1892. Manufacture of Wrought Iron. J. Lakin, Wolverhampton.
- 12,492 of 1892. Treatment of Silver, Copper, Zinc and Lead Sulphides. John David, Swansea.
- 12,625 of 1892. Rope Grip for Colliery Cars. R. S. Williamson, Hednesford.
- 13,698 of 1892. Recovery of Ammonia Compound. E. de Cuyper, Mons, Belgium.
- 6,059 of 1893. Puddling Furnaces. J. Roberts, Catasauqua, Pennsylvania, U. S. A.

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, MAY 30TH, 1893.

- 498,239. Multitubular Boiler. Alphonse Coignet, Lyons, France.
- 498,272. Steam Generator. James Hunter, Albany, N. Y.
- 498,284. Smoke Consuming Furnace. Paul Möhler, Schwäbisch Gmünd, Germany.
- 498,304. Apparatus for Shaping Steel. John A. Potter, Munhall, Pa.
- 498,313. Drilling Machine. Thomas C. Sims, Hubbard, Ia.
- 498,325. Safety Tunnel Warning Device. George W. Thompson, Leadville, Colo.
- 498,334. Power Hammer. Daniel Longworth, London, England.
- 498,364. Excavator. Morton E. Pugh, Sunflower, Miss.
- 498,378. Furnace for Steam Boilers. Elijah M. Bosley, St. Louis, Mo.
- 498,385. Roller for Crushing Ore or Other Material. Thomas A. Edison, Llewellyn Park, N. J.
- 498,424. Ore Crusher. Uriah Cummings, New Haven, Conn.
- 498,438. Metal Tubing. James Callan, Waterbury, Conn., Assignor to Randolph & Clowes, same place.
- 498,493. Henry C. Sergeant, Westfield, N. J.
- 498,500, 498,501. Steam Boiler and Furnace. Caleb R. Ayer, Boston, and George A. Ayer, Worcester, Mass.
- 498,565. Tuyere. Joseph McClelland, Chicago, Ill.
- 498,577. Electric Locomotive. Albert Schmid, Allegheny, Assignor to the Westinghouse Electric and Manufacturing Company, Pittsburg, Pa.
- 498,605. Crane. Leonard Atwood, Philadelphia, Pa.
- 498,711. Apparatus for Regulating the Speed of Water Wheels. Charles Hagmaier, San Francisco, Cal., Assignor of one-half to the Pelton Water Wheel Company, same place.
- 498,735. Electric Welding Apparatus. John H. Bassler, Myerstown, Pa.

DIVIDENDS PAID BY MINING COMPANIES DURING MAY, 1893.

NAME OF COMPANY.	Paid in May.	Paid since Jan. 1st.	NAME OF COMPANY.	Paid in May.	Paid since Jan. 1st.
Alaska, Tr'd w'll, Alaska	\$.....	\$125,000	Lexington, Colo.....	3,000	15,000
American Turquoise....	.....	60,000	Maid of Erin, Colo....	.....	150,000
Belden Mica, N. H.....	5,000	25,000	Mayflower Gravel, Cal.	10,000	50,000
Bitumetic, Mont.....	40,000	200,000	Minnesota Iron, Minn.	.....	420,000
Calumet & Hecla, Mich.	500,000	500,000	Mollie Gibson, Colo....	150,000	750,000
Centennial-Eureka,	.....	.....	Morning Star D., Cal.	7,200	36,000
Utah.....	15,000	92,500	Napa Cons., Cal.....	.....	40,000
Champion, Cal.....	3,400	17,000	North Star, Cal.....	.....	50,000
Cleopatra, Cal.....	37,500	187,500	Oseola, Mich.....	50,000	50,000
Colorado Central, Colo.	13,750	27,500	Pacific Coast Borax....	.....	15,000
Colorado Fuel Co., Colo.	.....	67,120	Parrott, Mont.....	18,000	90,000
Cons. New York, Nev..	.....	10,000	Pharmacist, Colo.....	12,000	36,000
Copper Queen, Ariz.....	100,000	200,000	Plumas, Eureka, Cal..	.....	26,367
Daly, Utah.....	37,500	187,500	Quincy, Mich.....	.....	150,000
De Lamar, Idaho.....	.....	250,000	Red Cloud, Idaho.....	.....	10,000
Elkhorn, Mont.....	.....	87,500	Rico-Aspen, Colo.....	25,000	25,000
Enterprise, Colo.....	25,000	125,000	Seven Stars, Ariz.....	.....	97,500
Golden Reward, S. Dak.	.....	5,000	Sierra Butte, Cal.....	.....	15,313
Great Western Quick-	.....	.....	Standard, Cal.....	.....	10,000
silver, Cal.....	12,500	62,500	Trinity River Hydraul-	.....	.....
Hecla Con., Mont.....	15,000	75,000	ic, Colo.....	2,500	10,000
Homestake, S. Dak.....	12,500	62,500	Utah, Utah.....	.....	5,000
Hope, Mont.....	25,000	125,000	Victor.....	10,000	40,000
Horn Silver, Utah.....	.....	50,000	W. Y. O. D., Cal.....	3,000	15,000
Idaho, Cal.....	7,750	38,750	Total.....	1,145,600	4,756,543
Kennedy, Cal.....	.....	50,000			

Coal Trade of Japan.—During 1892 Japan produced about 3,000,000 tons of coal and consumed only 2,050,000 tons,

PERSONALS.

Mr. Eben E. Olcott, mining engineer, of this city, has left for Canada, on professional business.

Mr. Henry C. Winship has resigned his position as general manager of the Chesapeake & Ohio Canal, to give his attention to other business.

Mr. W. H. Radford, mining engineer, has returned from a professional trip to Ecuador, and has gone to the North Bloomfield Grand Mine, California.

Mr. A. B. Thomas, superintendent of the Silver Sunlight Mining Company, of New Mexico, is now in Chicago, making a careful study of the Exposition.

Mr. W. R. Eckart, of San Francisco, consulting engineer to the committee to report on the feasibility of draining the lower levels of the Comstock, is now in Virginia City.

Prof. George Lunge, of Zurich, Switzerland, the distinguished authority on acid and alkali manufacture, expects to visit this country in August, and can then be consulted professionally on his specialties.

Dr. R. W. Raymond has just returned from Montana, where he has been on professional business in connection with the suit of the St. Louis Mining Company vs. the Montana Mining Company, Limited.

Messrs. Knox, Wier & Co. have recently opened offices in the Unity Building, Chicago, where they will represent the Edwin Booth Gold Mining Company, of Colorado; the Columbia-American Mining Company; the Western Consolidated Mining Company; the Silver Tip Mining Company; the Northwestern Mining Development Company, and the West Kootenay Mining Company, of British Columbia.

Mr. C. W. Coman, of Trenton, N. J., a geologist, employed on the State Geological Survey of New Jersey, has disappeared mysteriously, in Florida. Coman had an idea that there is a rich phosphate deposit near the head of the St. Lucie River, in Dade County, Fla. He went down there last January, purchased a small boat, and started alone up the St. Lucie River. Since January 7, when he wrote his wife, nothing has been seen or heard of him. As the St. Lucie County has scarcely any mail facilities, several weeks elapsed before Coman's friends began to worry. Searching parties have been organized.

Mr. F. J. V. Skiff, chief of the department of mines, at the World's Fair, received recently a pretty token of regard. A solid gold shield badge, typical of the department which he presides over was presented to him by Mr. Burchard, chief clerk, on behalf of the other officials. The shield of the badge is suspended from an oblong bar of solid gold. The word "Mines" is engraved on the bar. Above the bar are a crossed pick and hammer. The shield is engraved with the words "World's Columbian Exposition, 1893." A solid silver badge will be worn by the official staff. It will be a reproduction of Mr. Skiff's.

OBITUARY.

George E. Hogg, aged 75 years, died at Merrittstown, Pa., on May 23d. He was one of the largest owners of coal lands in Fayette County, Pa.

David Jones, inside superintendent at Waddell's Mill Hollow colliery, near Kingston, Pa., was crushed beneath three tons of solid rock which fell from the roof of the mine, on May 27th. He was one of the best known mining men in Wyoming Valley.

Charles Drayton Gibbs, formerly Curator of Mineralogy in the California Academy of Sciences, and a civil engineer and surveyor by profession, died May 25th, at his home in San Francisco. He was born at Charleston, S. C., and was 80 years of age at the time of his death. Forty years ago he removed to California, since which time he has been identified with various scientific societies.

E. P. Peckham, for nearly 20 years a member of the San Francisco Stock Exchange, died at his residence at Alameda, Cal., May 26th, after an illness of many months. Deceased was born in Rhode Island, arrived in California in 1850, and during the bonanza times was the chief broker for Flood, O'Brien & Fair. For six different terms he served as president of the San Francisco Stock Exchange, and retired from business in June, 1892, on account of failing health. Mr. Peckham was 74 years of age and leaves a daughter as his sole heir, his wife and sons having been dead for some time.

Judge R. S. Mesick, for many years attorney for the bonanza firm of Flood & Mackay, died at the Palace Hotel, San Francisco, of chronic bronchitis, May 26th. He was born in New York State, graduated at Yale College, and studied law with David Dudley Field. In 1849 he went to California and had varying success at the mines. In 1880 he settled in San Francisco, and has been identified with some celebrated mining and other suits. He was employed in the Tombstone, Ariz., mining cases and in the Mlatatos mine cases, in Mexico. He also took a prominent part in the Hale & Norcross suit, now on appeal, but retired from

the conduct of that case early in the trial. He was 69 years of age.

James Neilson, who died in Youngstown, O., May 25th, aged 53 years, was born in Scotland, and came to this country when a young man. After a short time spent in Canada, he settled at Youngstown, where he was employed at the Old Powers coal mine, and later was placed in charge of the blast furnace at Haselton. In 1880, he became a member of the firm of Andrews Brothers & Co., which was afterward organized into a joint stock company, of which Mr. Neilson was vice-president and general manager. He was also, at the time of his death, president of the Youngstown Bridge Company and Mahoning Ore Company, and was interested in the Youngstown Car Company, and the Ohio Steel Company.

SOCIETIES AND TECHNICAL SCHOOLS.

Johns Hopkins University.—Prof. George H. Williams, chief of the geological department of Johns Hopkins University, has completed arrangements for the annual geological trip of the university. The strata of Western Maryland will be studied this year, and the trip will last eight days. The party will visit the ore-beds of Raceoon Creek, Hancock and North Mountain, Frostburg and the Cumberland coal basin.

Montana Society of Civil Engineers.—At an adjourned meeting held in Helena, May 20th, letters were read by the secretary from various mines and smelting works throughout the State, in response to a request from him that foreign engineers visiting the State during the coming summer be permitted to inspect their works; also the list of important engineering works sent by the secretary to the general committee of engineering societies, Columbian Exposition. Mr. Albert Moog was elected member. A report was received from the committee appointed at the annual meeting to draft a bill regulating the compensation of county surveyors, submitting a copy of a proposed bill. The secretary was instructed to procure for the library of the Society the volume entitled "The Mineral Industry," published by the "Engineering and Mining Journal." Extracts were read by the president from a book entitled "Triangular Surveys from Single Stations," by Augustus Knudsen; also a review of the work by Mr. E. H. Beckler, and discussion followed.

Engineers' Club of Philadelphia.—At the regular meeting, May 20th, the secretary presented a letter from Mr. E. L. Corthell, and a description of the visit of a party of French engineers to this country during the latter part of August, by which it was understood that they should be entertained by this club while in Philadelphia. The matter was referred to the Committee on Foreign Guests, to be appointed. A discussion followed as to the rules prevailing among architects and builders for vertical pressures that can be safely borne by high masonry walls; it was informally stated by Mr. W. C. Furber that the rules which prevail among architects and builders for proportioning of high masonry walls are, to a large extent, empirical ones. These rules, under ordinary conditions, give safe results. All large cities, however, have building regulations which prescribe minimum thickness for various heights, and which are supposed to have been derived from observation and practice. There is, nevertheless, a marked difference in what each city considers sufficient. The meeting closed by a discussion on loads for ball bearings, in which several members took part.

Boston Society of Civil Engineers.—At the regular monthly meeting in Boston, May 17th, William M. Brown, Jr., Levi R. Greene, Herman Gregg, William P. Morse and James H. Stubbs, were elected to membership. The president announced the death of Augustus W. Locke, a member of the Society, which occurred on May 13th, and a committee was appointed to prepare a memoir. Mr. Dexter Brackett gave an account of the freezing of the main supplying water to Long Island, in Boston Harbor. About 1,200 ft. of 6-in. pipe laid with the Ward flexible joint across a channel between Moon and Long islands, was frozen during the past winter. The pipe where frozen was constantly covered with from 15 to 25 ft. of water, and the freezing was due to the fact that the salt water of the harbor by which the 6-in. pipe was surrounded was cooled to the temperature of 28° Fahr. Many of the pipes instead of being burst by the freezing water were separated at the joints, that is, the spigot ends of the pipes were drawn entirely out of the bells into which they had been leaded. Mr. George A. Kimball opened the discussion of the evening on the "Measurement and Value of Water Power." He was followed by Messrs. C. T. Main, L. M. Hastings, W. E. Buck and R. A. Hale. This discussion was continued to the June meeting.

Western Foundrymen's Association.—A meeting of foundrymen from Ohio and the states west was held at the offices of the Detroit Foundry Equipment Company, in Chicago, May 25th, in answer to a call issued by several leading firms, for the purpose of forming an association. Mr. C. A. Sercomb was chosen chairman. Addresses were made with regard to the subject of the meeting and a letter was read from the president of the Foundrymen's Association, of Philadelphia, show-

ing the advantages of such an association. It was decided to form a permanent association, and a committee was appointed to draw up a constitution. After a brief adjournment, the committee reported and the report was adopted. The association will hold monthly meetings at the headquarters, which will be located in Chicago, and the annual meeting will be held in May, of each year. Persons, firms and corporations engaged in the foundry business will be eligible to membership, and others whose knowledge may be of value to the association may be chosen associate members. The following officers were elected; President, C. A. Plamondon; vice-president, J. M. Sweeney; secretary, B. M. Gardner; treasurer, A. L. Patch. Executive committee, C. A. Sercomb, S. H. Holley, Geo. W. Cope, J. E. Griffen and J. A. Penton. The association then adjourned until June.

Armour Institute, Chicago.—This school has been established on a comprehensive scale, and has been furnished through the liberality of Mr. Armour, the founder, with convenient and handsome buildings and the best facilities attainable in the way of apparatus, library, etc. The Institute is organized into departments, each of which is in the charge of a director. The council of directors, with the president, constitutes the governing body of the Institute. The departments already organized are the following: Academic, Mechanical Engineering, Electricity and Electrical Engineering, Mining Engineering and Metallurgy, Domestic Arts, Library Science, Art, Kindergartens, and Commerce. The latest addition is the department of Mining Engineering and Metallurgy, which has been placed under the charge of Dr. Herman Haupt, Jr., late of the University of Pennsylvania. The examinations for admission to this department will be held June 20th, September 11th and 12th; applicants will be examined in algebra, plane geometry, elementary physics and chemistry. The course of instruction will cover two years, and will include hydraulic and mechanical mining, the preparation and milling of ores, the appliances and methods used in roasting, reducing, concentrating and smelting ores, the apparatus employed in lighting and ventilating mines, surveying, hoisting apparatus, mine cars and tramways, explosives, drilling, tamping, and blasting, by fuse and by electricity, the stamp mill, and apparatus for crushing and powdering ores, pans, separators, methods and appliances for collecting the precious metals, the appliances and manner of extracting metal from the ores, the assaying of ores, fluxes, and slags, the manufacture of steel and alloys, the determination of the commercial value of metals, mining property, gas and steam coals, and the geology of mineral veins. The instruction will be given by lectures and laboratory work, blowpipe analysis, assaying, practical examinations and surveys in the field. It is announced that, in view of the opportunities afforded by the Columbian Exposition, Professor Haupt has consented to take immediate charge of his department. Thus the Institute is enabled to offer to students who expect to enter this department, and to others who may desire to avail themselves of the opportunity, the privilege of visiting and studying the exhibits at the Columbian Exposition, in the department of mining, under the instruction and personal guidance of a specialist. A class will also be formed for practical field work, which during the summer will visit various mines in order to obtain an immediate introduction to the work of the mining engineer.

INDUSTRIAL NOTES

The Lehigh Iron and Steel Company put its furnace at Aineyville, Pa., into blast recently, after a long rest.

The Bristol Furnace Company, Bristol, Tenn., has made arrangements to start up its blast furnace shortly.

Selma Furnace, Va., has gone out of blast for repairs, after being continuously at work since October, 1891.

The Stearns-Roger Manufacturing Company is making additions to its foundry and machine shop, at Denver, Colo.

The Brown-Bonnell Iron Company, Youngstown, O., has completed its new bar mill, which will be started up in a short time.

The Burden Iron Company, Troy, N. Y., has blown out one of its furnaces for repairs; several improvements will also be made.

The Butman Furnace Company, Chicago, has put in a Butman vertical boiler of 400 H. P. in the Grant Locomotive Works, in the same city.

Eight of the leading brass companies in Boston and vicinity have acceded to the demands of the workmen for a nine hours' working day.

The Merrill-Stevens Engineering Company will make additions to their plant at Jacksonville, Fla., and will manufacture phosphate machinery extensively.

The engine-room and blooming department of the Lackawanna Iron and Steel Works, at Scranton, Pa., were destroyed by fire on May 29th. Loss, \$80,000.

The Boston Bridge Works recently completed a large iron building for the rolling mill of the Wash-

burn & Moen Manufacturing Company, in Worcester, Mass.

At a recent meeting of the stockholders of the Detroit Electrical Works, a committee was appointed to investigate the affairs of the company with a view to reorganization.

The West-End Rolling Mill Company, Lebanon, Pa., has elected J. Henry Miller, president; John R. Evans, superintendent, and H. M. Clapp, secretary and treasurer. The company has declared a 6% dividend.

The Bellaire Boiler and Bridge Company, of Bellaire, O., has been reorganized, and a new board of directors elected, as follows: H. A. Lichtenberger, Samuel Simmons, John Adams, Louis Grelia and Edward Blackburn.

At the annual meeting of the American Bridge and Iron Company, in Roanoke, Va., May 25th, J. C. Rown was elected president, and C. C. Wentworth, general manager. William Cather was appointed superintendent of the company's foundry.

The Foss Manufacturing Company, Springfield, O., has issued a neat catalogue which, besides a variety of portable grinding mills and horse powers, shows the company's "Cyclone" portable forges and blowers, the excellence and convenience of which are so well known.

The Hydraulic Machine Company, Pittsburg, Pa., is putting up a new foundry building of brick and iron 106 x 70 ft. in size. The company is building two hydraulic ingot extractors for the Cleveland Rolling Mill Company, Cleveland, O., and a large crane for the Central Iron Company, Harrisburg, Pa.

The Crescent Foundry and Construction Company, a new organization, has bought the plant of the Crescent Foundry Company, in Allegheny, Pa. The new concern will make a specialty of blast furnaces and rolling mill work. The officers are: D. R. Lean, chairman; R. B. Lean, treasurer, and N. A. Didier, secretary and manager.

A very large girder was recently shipped from the Philadelphia Bridge Works, of Cofrode & Saylor at Pottstown, to Philadelphia, and will be used by the Pennsylvania Railroad Company to span Fifteenth street, in the new Broad Street Station. The girder is 58 ft. long, 11½ ft. high, and weighs 110,000 lbs.

The Minnesota Blast Furnace Company, Duluth, Minn., was placed in the hands of W. H. H. Stowell, as receiver, on May 25th. The company was making pig iron for the West Superior Iron and Steel Company, and became embarrassed owing to the failure of that company. It is believed that the difficulty can be adjusted in a short time.

In December last the Grusonwerk, at Magdeburg-Buckau, Germany, were leased to the firm of Fred. Krupp. It is now announced that on May 1st the Krupp firm purchased the works, with all their assets and liabilities, and will hereafter conduct them as a branch of the main works at Essen. No change has been made in the working staff. The Grusonwerk company will be wound up.

The Rome Locomotive and Machine Works, of Rome, N. Y., have been incorporated. The objects are to manufacture and sell railroad locomotives, portable and stationary engines, cars, machinery, etc. The capital stock is \$150,000, and the directors for the first year are: Thomas H. Stryker, Edward Constock, Rome; William B. Isham, Henry A. V. Post and Ralph N. Ellis, New York. The company is a reorganization of the New York Locomotive Works.

At a meeting of Fraser & Chalmers, Limited, in London, recently, the chairman stated that during the depression in mining in this country, in 1892, the company had been unable to earn a dividend, and that business had fallen off greatly. Fifteen customers bought in 1891 less than one-quarter of what they bought in 1890, and in 1892 they bought less than one-tenth. South African business seems promising, and it is quite possible that the new works at Erith will be able to make a profit.

The contract for building the new elevated line of the New York Central & Hudson River Railroad, from 110th to 144th streets, in New York, has been awarded in four sections; the first, second and fourth, to the Elmira Bridge Company, of Elmira, N. Y., and the third to the New Jersey Steel and Iron Company, of Trenton, N. J. The total length of the elevated structure is 6,409 ft., of which the Elmira Bridge Company will build 5,326 ft. at a contract price of \$1,142,000, and the New Jersey Steel and Iron Company, 1,083 ft. for \$333,000. The contracts include the iron work of the viaduct only, the substructure having already been let and work commenced, while the company will itself lay the ties and rails.

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.

ALABAMA.

Gold.

(From our Special Correspondent.)

The gold bearing quartz districts in Cleburne and Randolph counties are receiving more attention now than at any time during the past 30 years. In the past, and previous to the days of '49, the work in this State was principally confined to placer mines in the vicinity of Arbacoochee, in Cleburne County, where a few men are still working rockers and claim to be taking out wages. The expensive hydraulic plant near there is idle at present, and has been for the past year, but previous to that time it was operated quite extensively as the excavations on the property prove. Until within the past few months the work on quartz ledges was confined entirely to shallow prospecting, the deepest only reaching the water level. The gold mines on which systematic development work has been done in this district are: The Pinetuckey, in the northern portion of Randolph County; Hicks-Wise, near the northern base of the Turkey Heaven mountains, in Cleburne County; Annie Howe, in the same neighborhood; Lucky Joe, near the southeastern base of Turkey Heaven mountains; Mossback, in the same neighborhood as the last named, and Crown Point, about three miles north of Meaville, in Cleburne County. On each of these properties stamp mills have been erected, except at the Annie Howe, where a Huntington mill furnished with Frue vanners, as well as amalgamating table, was built. The machinery for the Lucky Joe 10-stamp Fraser & Chalmers mill is being put in place, and the stamps will drop early in June, on ore taken from the vein 45 ft. below the surface.

At Pinetuckey, in addition to amalgamation, a concentration process has been successfully adopted. The vein on this property is in the granite formation and bears all the characteristics of a true fissure. So far as at present known it is the only one in this entire district locally known as the Turkey Heaven, which in extent is about 10 miles in length from northeast to southwest, and six miles in width at the widest point. The workings at Pinetuckey, besides some shallow prospecting, consist of a shaft 55 ft. deep, with drifts run both to the north and south from the bottom of the shaft, a total distance of about 100 ft. The vein dips to the east at an angle of about 20°, where it is exposed in the drifts, but above the dip was nearly vertical. At the surface it showed a thickness of about 3 in., which has increased to an average of 15 in. at the 55-ft. level. The assay value of the ore is from \$50 to \$150 a ton, with sulphurets predominating in the \$50-ore. About \$44 will be found in the sulphurets; this may be considered a fair average mill test. This vein can be traced by the outcrop in almost a direct north and south course for a distance of two miles. Many rich free gold specimens are found in the ore.

The Hicks-Wise property shows a larger ore body than any other in this district, but whether it is a stratified vein or a deposit can hardly be determined at present, because the supposed foot wall on the 85-ft. level at many points proves to be merely a thin strata of decomposed slate and clay, underlain by ore, which fact was demonstrated in picking for foundations for the upright timbers in the drifts on that level. Neither has any hanging wall been yet encountered, although in the drifts in both directions north and south on this level, the ore body has been crosscut an average of 18 ft. The outcrop would indicate that the ore body was at least 40 ft. in thickness, and it can be traced continuously for 1,500 ft. on the surface, and irregularly for a distance of a mile and a half. The average assay value is \$8 a ton, but only 25% of this has been saved up to the present time by amalgamation. The ore body has been sunk on 122 ft. or 37 ft. below water level, and below the present working level, on which 170 ft. of tunnel has been run through ore the entire distance, and exposing ore at both faces. The ore is treated in an old 10-stamp mill, where the most crude process of amalgamation is carried on, no quicksilver being fed into the battery, and no inside plates used in the mortar. The superintendent has been using this plant merely for prospecting purposes, and is now in the north, where he has made arrangements for the erection of a 40-stamp mill on the property.

At the Lucky Joe the outcrop showed four thin parallel stratified veins inclosed in slate walls, about an average distance of 10 ft. from each other, and a few feet below the surface the dip of these veins indicated that they would eventually come together. A working tunnel was run to crosscut the veins at a point about 50 ft. below the surface, and the result of this work exposed the first vein 76 ft. from the mouth, and to a thickness of 6 ft., which prospects satisfactorily the entire thickness; although 10 ft. further has been run in the country rock, the second vein has not yet been encountered. Work is being pushed as rapidly as possible, and

ore is being taken from the first vein to run the mill on as soon as ready. The water supply is brought a distance of 1,800 ft. in box flumes and pipes.

At Crown Point the workings are all of a prospecting nature, showing a stratified vein of low grade ore about 6 ft. thick a few feet below the surface which dips nearly south at an angle of nearly 45° with its strike almost east and west, which can be traced by the prospect work and outcrop a distance of nearly one mile. A five-stamp mill has been erected and run on the ore, the results indicating that with greater crushing capacity the property should pay, but with five stamps only it is impossible to run at a profit.

The Annie Howe and Mossback properties are both idle, and the workings in such a condition that no examination can be made at the present time.

Several new discoveries have been made in the district within the past few weeks, and prospecting work is being carried on at some of these locations, but sufficient showing has not yet been made to determine either the character, grade, or extent of the prospects, although samples from several show good pan tests in free gold. The low cost of labor, abundance of both hard and pine timber as well as water favor this district, and if the new discoveries prove that the quantity and grade of ore is satisfactory a stampede is possible. The cost of labor is as follows: Miners, both above and below surface, \$1 to \$1.25 per day; shift-bosses, \$2; laborers and teamsters, \$1; amalgamators, \$2 to \$2.50; expert engineers, \$2 to \$2.50; ordinary engineers, \$1.25 to \$1.50; feeders, \$1.25 to \$1.50; rock breakers, \$1. The cost of fuel is 90c. per cord, delivered, when cut off the mine property, and from 45c. to 60c. per cord, delivered, when cut on. Mining timbers cost an average of about 10c. each piece, but vary according to whether round or square timbers are used; at present round, rough timbers direct from the woods, are generally used. The cost of hauling is regulated by distance; a team with driver generally earns about \$2.50 per day.

ARIZONA.

Cochise County.

Copper Queen Mining Company.—The suits against this company and D. D. Ross for cutting and using timber on non-mineral land, came up in the U. S. Court at Tucson, recently. These suits were dismissed at one time, but on an appeal being taken, instructions were given to have them re-instituted. The amount involved is \$90,000.

CALIFORNIA.

Amador County.

New London.—This property has been sold and will be worked, it is said.

South Spring Hill Mining Company.—A tunnel is being run from the Talisman to the Medea, just back of the Keystone, at a higher elevation.

Zeile Mining Company.—According to the "Amador Ledger," operations were commenced on this mine on the 1st inst. It has been shut down for seven months.

(From our Special Correspondent.)

Clinton Consolidated Gold Mining Company, Jackson.—A suit has been instituted by Wells, Fargo & Co. against the above corporation and C. S. Ireland, as president of the company, to recover \$5,133, with interest at the rate of 9%, on a promissory note executed by the company in favor of the plaintiffs ten years ago. The claim is made that neither principal or interest has ever been paid.

Butte County.

Aurora.—The machinery is being removed from this property and is offered for sale.

Eldorado County.

(Reported for the "Engineering and Mining Journal.")

Sierra Nevada Land, Water and Improvement Company.—The 30 quartz mines of this company are not being worked at present. The results from the placer claims are good, however. For our information we are indebted to the president of the company, Mr. Arthur Young.

(From our Special Correspondent.)

The Idlewild Gold Mining Company.—The defendants in the suit recently instituted have applied to the court to set aside the restraining order commanding them and the company not to transfer the stock in dispute. The stock is worth from \$2.50 to \$3.50 per share, and as the number of shares involved in the suit is 26,240 the total amount in dispute is quite large. In the answer to the complaint filed this week it is denied that Straut ever owned the certificate of stock, but that E. S. Chester, also deceased, was the actual owner. Attorney Ash, one of the defendants, alleges that he did not prevent the widow Straut from reporting the certificate as part of her husband's estate, but that he did advise her that it belonged really to the estate of Chester. It passed into the possession of Straut originally to prevent W. S. and E. W. Chapman from getting control of the company's stock, and was to be held by Straut pending two suits of his against the Chapmans and the company. It denies any conspiracy on his part with A. E. Ball, who is administrator of Chester's estate, to get control of the stock in dispute. Long prior to the deaths of Straut and Chester, the answer avers that the Chapmans cou-

trolled the board of directors down to the election in 1892. In conclusion, it is alleged that the plaintiff and her present attorneys have conspired to cheat and defraud him (Attorney Ash) of certain fees due him for services rendered in connection with the estate of Strant, and that the present suit has been instituted for that purpose.

Mono County.

(Reported for the "Engineering and Mining Journal.")
Standard Consolidated Mining Company.—We are informed by President Thos. H. Leggett, of this company, that the electric plant mentioned in our issue of May 13th is likely to be in operation shortly. Very little is going on in Bodie, and this mine is closed down in order to re-timber the shaft.

The Bulwer, Bodie, Mono and Summit mines, under the superintendency of John W. Kelly, are still being operated. The first of these lies to the south of the Standard, and the Bulwer mine adjoins it on the west and the Summit on the east. These mines have a series of narrow veins, from 1 to 2 ft. wide, gold-bearing, but with higher silver contents in the Bodie and Mono. All these ledges have petered out at 500 ft. depth. All these properties, with the exception of the Bodie, have been assessed from time to time. This latter property, however, has paid several dividends during the past five or six years. The Mono and Bodie mines are worked from the 1,200-ft. Lent shaft, but the former is closed down owing to the failure to collect the last assessment, and in the Bodie but five miners are employed in the upper levels. The lower levels have disclosed small and erratic seams of low grade quartz and spar, from 1 to 3 in. wide. The ore here is sometimes very rich, particularly in native silver, but no profitable veins of ore have been discovered. With wood at \$10 per cord, the expense of keeping the lower levels of the mines drained is so great that it is prohibitory to working at any depth.

Sonoma County.

(From our Special Correspondent.)

Palo Grande Coal and Transportation Company.—This corporation is composed of Salt Lake and San Francisco capitalists, and has purchased 2,000 acres of land for the purpose of prospecting for coal and developing the veins known to exist. The land is near Mark West, and \$200,000 has been raised with which to begin work on the mine and so connect by railway with the town of Santa Rosa. From thence a road will be built to Petaluma, where tidewater will be reached. Contracts have been let to sink a shaft 500 ft. deep, to build the two short lines referred to, and to build bunkers and barges. All these contracts are to be completed by May 10th, 1894. Machinery and other material is already on the ground and active work will begin early in June.

Tolunme County.

Columbus.—This quartz mine, at Cherokee, has been bonded to William Johns, representing the Sierra Buttes Mining Company, for \$6,000. Development work has been begun. It is said that this mine has yielded a profit, when worked in a small way, and when the ores have been reduced in an arrastras.

COLORADO.

Boulder County.

Cash-Birkin.—This mine is nearly closed down on account of the lawsuit brought by the Bella. The mill is running half-time; the returns from the last shipment were 4 oz. gold and \$150 silver per ton from the concentrates.

Victoria.—A good body of ore has been struck on the 240-ft. level; heretofore it has been worked unprofitably.

Clear Creek County.

Fortunatus Gold and Silver Mining Company.—During the past 11 months 264 tons of ore netting \$10,711 were shipped. The main shaft was sunk 300 ft. and much good ore is said to be on the face of all the drifts.

Custer County.

Work will be resumed on the Pocahontas.

The Wild Girl and High Kicker mines have been sold.

Bull-Domingo.—The ore body is about to be opened on the 900 level. It is said to be good ore still between the 200 and 300 level.

Dolores County.

In the United States Circuit Court, at Denver, on the 18th inst., a motion to make the complaint in the suit of the Rico-Aspen Consolidated Mining Company against the Enterprise Mining Company more specific and certain was sustained. The plaintiffs were ordered to make their complaint within ten days and to state more definitely where the defendant ran its drift while in the plaintiff's territory.

Atlantic Cable Consolidated Mining Company.—It is stated that the local stockholders of this mining company at Rico will make application for the appointment of a receiver, as they claim the property is not being worked as it should be.

Iron Dollar Mining Company.—Prospecting with the diamond drill is still going on on this property.

Rico-Aspen Mining Company.—Three cars are being shipped daily from this property, which is said to come from development work.

Lake County.

(From our Special Correspondent.)

The Arkansas Valley smelter is running six stacks, treating about 10,000 tons of ore monthly, producing about 1,000 tons of bullion. A new roasting plant for the treating of refractory ores is to be erected. At the American smelter between 6,000 and 7,000 tons of ore were treated, making over 600 tons of bullion. The Bi-metallic people are busy putting their new machinery in place, but are working steadily with two furnaces in blast, which are treating 150 tons daily of sulphide and silicious ores. This company will blow in another stack sometime this month.

Early Rose Group.—This consists of the Early Rose, Lucky Boy and Maid of Erin, located on Dwyer Mountain, where the owner is now preparing to work them.

Fortuna.—It has been asserted on good authority that this mine, which has been lying idle for some time, is to be started up.

Hopkins.—From developments by former lessees on this property, it is believed that the mine is located on the famous Hill Top ore chute, so preparations are now being made for a vigorous resumption of work by the owners. The mineral, whenever encountered, runs well in silver and lead.

Midnight.—This property is one of the best paying properties of the district. At present shipments are light, on account of the bad roads.

R. A. M.—This shaft, on the Marian Company's lease, is now in porphyry, and has gained a depth below the old workings. It will be pushed to a depth of 1,000 ft., making it one of the deepest and best shafts in the camp.

Shamrock.—The flow of surface water has ceased, and operations have been resumed. These lessees have encountered a very good body of carbonate ore, assays from which return 26% lead and 30 oz. silver per ton.

Wild Cat.—This enterprise consists in sinking a shaft west of the Penderly fault. This new shaft is to go down on the Wild Cat property, and is in line to catch the intermediate bench between the Gazelle and Niles-Angusta properties.

Wolcott.—Work on the ore body is being pushed, and the entire workings are in good condition. Some 50 tons daily of good grade lead ore, averaging \$30 per ton, are being hoisted.

Mineral County.

Alpha.—This company is now making rock shipments. The carloads of ore run about 50 to 60 oz. silver per ton.

Alpha Mining and Milling Company.—This company has been organized to work the Alpha mine, at Sunnyside. Six cars of ore, yielding from 60 to 70 oz. of silver per ton, have already been shipped. The shaft is down 60 ft. and there is also a tunnel of 350 ft. on the vein. It is proposed to sell 50,000 shares of stock at 15 cents per share to provide the working capital.

Antlers-Park-Regent.—This corporation, which owns ten claims on Bachelor Mountain, is offering stock for sale. It is said to have the Last Chance Amethyst vein for nearly 4,500 ft.

Baltimore & Creede Mining Company.—The pay streak in the No. 3 shaft in the Argenta claim of this company is gradually widening.

Baxter.—Favorable developments are said to have been made on this property. The ore has been yielding an average of \$37.22 per ton.

Nancy Hanks Mining Company.—This company has been organized to work the Nancy Hanks claim, near Creede, and has offered its stock for sale. The vein is on the contact on Mammoth Mountain. Development work is going on and it is hoped that a body of pay ore will be struck.

Pitkin County.

The new Durant tunnel has tapped the Aspen ore body 300 ft. below the old workings. From this tunnel, work on the Connemara will be prosecuted. The Mineral Farm is shipping 125 tons of 50-oz. ore weekly.

Bushwacker Mining Company.—Development work is being done on this property and considerable ore is being blocked out.

Famous Tunnel.—Work on this property will be started up soon, money having been raised sufficient to run the tunnel 1,000 ft. further, which is enough to tap the first mineral contact.

Pontiac Mining Company.—A hearing has been going on at the Land Office against the issuance of a certificate to Rain Storm No. 2 and Snow Storm No. 2, claims, belonging to this company. The protestants claim that at the time of the issuance of the receiver's certificate, \$500 worth of development work had not been done on the property as required by law. Since then, \$30,000 has been expended, and mineral discovered. The interference is regarded as more or less in the nature of blackmail.

Schiller.—Rich ore at a depth of 500 ft. has been struck on this property, it is claimed. This mine is located at the highest point of Aspen Mountain.

Smuggler Mining Company.—Two hundred tons of ore per day are sent to the concentrator from which returns of \$28,000 and \$29,000 per month are made. There are immense quantities of this grade of ore available on the property.

St. Joe & Mineral Farm.—This mine is shipping about \$800 per day, and has reduced its indebted-

ness. It is being developed through the Covenhoven tunnel, which is now in nearly two miles in Smuggler Mountain.

San Miguel County.

It is said that a consolidation of the Smuggler, Union and Sheridan mining companies has been made, and that the Sheridan mine will be worked through the Smuggler. The ore will be taken down on the Smuggler tramway, instead of using the cable tramway belonging to the Sheridan mine. The Belmont mine will start shortly under the management of T. J. Waters.

FLORIDA.

Marion County.

Compagnie des Phosphates de France.—The "Manufacturers' Record" gives an interesting account of the extensive plant put in by this company, near Ocala. About 300 men are employed, and 175 tons a day can be handled. The mining is all done by hand, the material being handled by a light portable railway of the Decanville system, which is so largely used for similar work abroad. A mile or more of this track is in use. The cars are built of iron and steel, and are built for the purpose of the Corry Car and Manufacturing Company, of Chicago. They are V-shaped in section, this form making them very easy to dump. The rocking parts are of the usual type, two arcs engaged by projecting pins. These cars hold about 3,000 lbs., and about 60 of them are now in use. They are handled to the foot of the incline at the washers by a H. K. Porter light locomotive. The washing plant consists of two double wooden log washers, built by the W. T. Adams Machine Company, of Corinth, Miss. A third washer of the same style and make is now being set up, and the frames are in place for a fourth, which will be added when needed. The machinery of the washer-house is driven by a 100-H. P. engine, built by the Atlas Engine Works, of Indianapolis, Ind. Steam is supplied by a pair of boilers from the W. T. Adams Machine Company. Wood is used for fuel. Water for the washers and for other purposes is supplied by three Knowles duplex pumps, 6-in. suction. These pumps are placed in a square timbered pit in the engine-house, about 20 ft. below the floor. The loaded cars from the mines are hauled up the incline to the washers by a wire cable which is wound on a drum placed at the end of and just above the washer, and it is driven by a friction wheel from the shaft that drives the washers. There is a separate track and winding gear for each washer. The empty car returns on the same track, but is sent to a siding by a switch at the foot of the incline. The logs of the washers are set on an incline of about one in ten, the cleaned phosphate being worked to the upper end by the knives, while the sand is washed out at the lower end and carried away in a wooden flume to a reservoir which has been constructed by an embankment of refuse matter from the mine pits. The washed phosphate, as it leaves the upper end of the washer trough, falls into a revolving perforated cylinder, where it is rinsed by small jets of water. The cleaned phosphate then drops to a rubber belt conveyor which carries the material to the cars, by which it is conveyed to the kilns upon an elevated track. There are three kilns. One of them is a brick platform of about 600 tons capacity, in which grate bars are set and the fuel is burned in flues underneath these bars. The other two kilns, each of about 1,200 tons capacity, are merely brick hearths upon which the wood and phosphate are piled. The representatives of the company in Ocala are Mr. George Thullier and Mr. C. S. Clarke. The superintendent of the works is Mr. Vincent Calderas.

GEORGIA.

Lumpkin County.

Mary Henry Mine.—The mill at this mine is running on full time, and it is said that the yield has been very satisfactory. The shaft at the mine is now on the vein, which is increasing in width.

Lond Mine.—The "Nugget" reports that at this mine a pocket of quartz has been struck, containing free gold in the form known as "wire" gold. A drift is being run with the expectation of finding the vein continuing the pocket.

IDAHO.

Alturas County.

Abbie.—This property has been bonded to Moutana mining men for \$24,000.

Idaho County.

Elk City.—The placer deposits and quartz veins in the neighborhood of Elk City are said to afford excellent prospects, but the lack of facilities for transportation and the rebelliousness of the ores have prevented much activity here. It is thought, however, that a reduction plant will be built capable of reducing the ore, and wagon roads will be constructed. There are some 500 locations in the district.

Lemhi County.

Comet.—This property is developed by three tunnels which strike the ore at various depths, the lowest being 275 ft. While the greater portion of the ore is low grade, there is said to be 2 ft. of \$75-rock.

Lemhi Placer Mining Company.—This company is prospecting in its gravel, and is completing repairs on its ditch line.

Yellow Jacket Mining and Milling Company.—It is reported that the company which has recently purchased this property has made a strike and intends to enlarge its mill.

Owyhee County.

There are a number of mines in the neighborhood of Silver City which will be developed during the summer. Among these are the Summit, the California or Allison, the Carolina, the Ontario and the Banner, most of which have produced small quantities of good ore.

Banner.—Prospecting on this claim, near Ruby Town site, south of Ruby City, has resulted in the extraction of a limited quantity of rich ore. The strike is small, but further development work will be done.

De Lamar Mining Company, Limited.—During the month of April 2,745 tons were milled. Bullion valued at \$70,055 was produced. The total revenue, including ore sales, amounted to \$78,105. The total expenses were \$37,594, leaving an estimated profit of \$40,511.

Howe-Manhattan.—The Milwaukee capitalists who have bonded this group of mines are now visiting the property.

Poorman Mines, Limited.—A rich strike is said to have been made in this property under the Bonanza shute, 1,700 ft. from the mouth of the tunnel.

Stoddard Mine.—This property, the vein on which is supposed to be the apex of the De Lamar vein, has been purchased by the De Lamar company in full. Three months ago, this company bought a three-fifths interest for \$20,000, but has now paid something over \$100,000 for the remaining two-fifths. It was bought principally to avoid litigation. The property outside of that is said to have some merit.

Shoshone County.

Helena & Frisco Mining Company.—From the third level of this mine some rich ore is being extracted which is expected to average 110 oz. silver and 70% lead. It is estimated that 600 tons of concentrates were shipped during May.

INDIAN TERRITORY.

Choctaw Coal and Railroad Company.—Advices from Philadelphia, Pa., state that a plan for taking the Choctaw Coal and Railroad Company out of the hands of the receivers and constructing the gap of 123 miles between Oklahoma City, O. T., and South McAlistier, I. T., has at last been promulgated. The Philadelphia & Western Improvement Company, with a capital of \$5,000,000, is being formed in Philadelphia, to complete the road. It is proposed to give the improvement company \$2,500,000 of income mortgage bonds in addition to paying it \$18,000 per mile in first mortgage bonds. As a further inducement the stockholders of the Choctaw company propose to contribute to the improvement company 5,000 shares of Choctaw Coal and Railroad Company stock, \$2,100,000 first mortgage bonds on 105 miles of completed railroad and first mortgage bonds on various leases, aggregating \$1,394,000, all of which bonds are unsold and are held by financial institutions in this city as collateral on loans aggregating \$2,500,000. About \$300,000 interest has accrued on this loan, which it is also proposed to turn over, the present holders of the bonds to become subscribers to the capital stock of the improvement company to the extent of the face value of the notes upon which the loans were advanced and surrender the notes to the Choctaw company free from debt. This will make each subscription of \$1,000 to the improvement company represent in bonds, accrued interest and stock, \$1,751.

KANSAS.

All the coal miners in northern Kansas were called out on strike on May 30th, and it is understood that all obeyed the order.

MAINE.

Knox County.

Booth Brothers & Hurricane Granite Company.—This company has 75 men at work in its quarries, on Hurricane Island.

Fox Island Granite Company.—This company has bought all the tools, derricks and machinery of the Martin's Point Granite Company, which has gone out of business.

Washington County.

Seal Harbor Island Granite Company.—This company has been organized to open granite quarries on Seal Harbor Island. The incorporators are: Daniel R. Donivan, George N. Rogers, Frank Kelley and Albert Kelley, of Jonesport.

MARYLAND.

Allegany County.

New York Mining Company.—The stock of this company has recently been sold to a syndicate of Maryland parties connected with the Black-Sheridan-Wilson Company. At a meeting held in Baltimore, May 24th, a new board of directors was elected, as follows: John Sheridan, H. Crawford Black, John Wilson, Lloyd Lowndes and Warren Delano, Jr. Subsequently the directors elected Mr. Sheridan president and Mr. Wilson, secretary and treasurer of the reorganized company. The capital stock is \$600,000. The property of the company includes 2,200 acres of land, much of which is known to be underlaid with Big Vein

George's Creek coal. It adjoins the mining property under the control and operated by the purchasers. No work has been done upon it for a number of years, but it is understood that arrangements will be made at once to reopen the old shafts.

MASSACHUSETTS.

Essex County.

Rockport Granite Company.—This company has bought the plant and property of the Cape Ann Granite Company, for \$90,700. This property is at Bay View, and includes 165 acres of land, with wharf, railroad track, derricks, tools, etc., and several barges. The sale also covers 23 acres of land at Wass Island, near Jonesport, Me.

MICHIGAN.

Copper.

Calumet & Hecla Mining Company.—The trammers' strike at this company did not last long. The men "went out" on May 21st and returned to work on May 24th.

Hulburt Mining Company.—A meeting of this company was held in Boston last week, to extend the corporate existence of the company for 30 years from the expiration of its present term, which is November 28th, 1893. The following directors were also re-elected: Gustav Stellwag, Charles Van Brunt, J. S. Bigelow, A. W. Spencer, Henry Sayles, A. S. Bigelow and John Daniell. This property has never been opened for mining, but it is held practically private, as it adjoins the Calumet and Tamarack mines. The company has sold land to the Calumet & Hecla Mining Company.

Kearsarge Mining Company.—The Lake Linden "Native Copper Times" says that reports from this property continue quite favorable. In some places where the lode had been poor, good bunches of copper ground are said to be coming in.

Quincy Mining Company.—According to the Lake Linden "Times," the masses of copper that had been accumulating at the Quincy have recently been hauled to the smelting works. The steps taken to build a smelting works, adds the "Times," may have been effectual in reducing the charges for smelting purposes by the old company.

Wolverine Copper Mining Company.—The agent of this company writes as follows: The mill has been working without any hitch since starting, and doing very fair duty. The new hoist, No. 3 shaft, has been working all the week and to my entire satisfaction. We have an excellent shaft, both skips run very nicely, figured at a speed of 800 ft. per minute, and the consumption of fuel has so far been about one cord in 24 hours. We are now in a position to furnish the mill with ease; in fact, could easily supply more mill rock. We shipped about 11½ tons of mineral on Wednesday last, and shall ship an equal quantity on Monday next. This was produced in nine days' running time, of which about 1½ days' product was retained in loading the jigs.

MINNESOTA.

Iron—Mesaba Range.

Duluth Iron Mining Company.—This company has given an option on 1,200 acres of its land to the Chicago & Minnesota Ore Company. The company has also given an option on some property near Mountain Iron to the Merritt syndicate.

MISSOURI.

Macon County.

Lewis Coal Company.—A dispatch from Macon states that this company, of that place, has gone into the hands of a receiver. The assets are between \$300,000 and \$400,000. The liabilities are unknown, but believed to be greater than the assets.

MONTANA.

The Belle is developed by a tunnel 95 ft. long. It has good grade of gold ore, which has been reduced in an arrastra. The mine has been worked for some years. The McCranor Group of mines has been thoroughly developed to a depth of 400 ft. Large quantities of ore have been exposed, much of which is of high grade; 1,700 tons of ore are on the dump. The Noble Mining Company's property has been worked to a depth of 1,200 ft. through a tunnel 2,100 ft. long.

An organization of the Miners' Unions throughout the northwestern states and territories, is being attempted at Butte. Its purpose is the regulation of wages and the establishment, if possible, of a uniform rate.

Anaconda Mining Company.

For over 30 days there was an average shipment of 140 cars of ore daily, or 2,800 tons.

Deer Lodge County.

Bimetallie Extension Mining Company.—Work will be begun on this property and a winze will be sunk in the 500 ft. level north.

Elizabeth Mining Company.—While attempts have been made to secure funds to resume operations at this property, nothing definite has been done yet. It is said that the directors could not secure the necessary two-thirds vote to make the stock assessable.

Lamb Mining Company.—The work of development on this property is proceeding; the tunnel is in 300 ft. and the shaft is down 40 ft. Small quantities of fair ore are being extracted.

Madison County.

Fairview.—This mine is developed by a tunnel 116 ft. long. The ore assays 18 oz. in silver and \$12 in gold. The Pedro mine has been worked to a depth of 130 ft. with successful results. A mill is being built on the Roach & Miller property. The Iron Rod mine has been worked for many years, and is now at a depth of 600 ft. The ore is rebellious, it is said, and the tailings are being worked by the cyanide process.

Park County.

Henderson Mountain Mining and Milling Company.—A clean-up of 140 lbs. of zinc precipitate, the result of operations in the cyanide mill, has been made. The mill at present is closed down awaiting the purchase of a new dryer. It is expected to start operations about June 1st.

Independence Mine.—This mine is said to be yielding about \$1,000 per day. It is operated by electricity generated by water power from the La Forge River.

King Solomon Consolidated Mining Company.—This company owns 12 claims about 60 miles southeast of Livingston. The only development work done so far is the sinking of a 60-ft. shaft.

NEVADA.

Elko County.

Independence Mining Company.—Experiments are being made at this company's mill in working low grade ore from the Coptis mine, by a new process.

Esmeralda County.

Monte Diablo Mining Company.—It is said that owing to the improved grade of ore now being extracted from this mine, operations will not be suspended, as was contemplated.

Eureka County.

The properties of the Eureka Tunneling and Mining Company, and the St. Peter's Consolidated Gold and Silver Mining Company, in Eureka County, are advertised for sale for non-payment of taxes.

Lincoln County.

April Fool.—An important discovery has been made on this property, at Helene. A ledge 8 ft. wide has been found, showing rich gold ore for 75 ft. A carload of ore which is expected to yield \$15,000 has been shipped.

Nye County.

North Belmont.—Rich antimonial silver ore is being found in this mine, at East Belmont.

Storey County.—Comstock Lode.

(From our Special Correspondent.)

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

Mines.	Tons H'std.	Car Sample Assay.	Tons M'ld.	Av. Bat'ry Assay.	Bullion for Week.	Bullion Shipped
Felcher...	54	.....	.....	.....	.....	.....
C. C. & Va.	390	\$16.01	655	\$22.11	.....	.....
Crown Pt.	1253	.....	.....	.....	.....	.....
Justice....	70	20.00	.....	.....	.....	.....
Kentuck..	21	30.00	.....	.....	.....	.....
Potosi....	487	26.72	473	24.90	.....	\$422
Savage....	2149	21.44	.....	.....	.....	.....

¹Shipped to the Mexican Mill. ²Cars. ³Crude Bullion.

Potosi Silver Mining Company.—At present this is the most interesting mine on the lode. Better work is being done and at a cheaper rate; the bullion return is in honest and reasonable proportion to the car sample assays, and the debt on the mine is being reduced. Notwithstanding, however, the prospecting has not resulted in developing any ore of great importance. In the north drift on the 930 level, some ore is showing that assays \$85 per ton, but the amount is limited. The indications a few weeks ago seemed to point to important developments, but none of these prospects have materialized to date.

NEW MEXICO.

Sierra County.

The Brockman mill, which has been running on ore from the Mountain Key and Lone Mountain mines, has been closed down for repairs. The mill of the Confidence Mining Company will be completed in October; work is now progressing.

It is expected that the vein on the Manhattan Mining Company's property will be cut by the tunnel within a month.

Socorro County.

(Reported for the "Engineering and Mining Journal.")

Silver Sunlight Mining and Milling Company.—This company, of which the Hon. L. Bradford Prince, ex-Governor of New Mexico, is president, is now being developed rapidly. The mines are situated one mile from the town of Kelly, and are in the Magdalena Range, where the Kelly mine, a very rich producer, is situated. From the tunnel, now in 130 ft., low grade ore has been taken in considerable quantities. Ore has been taken from this property that assays from 30 to 60% lead and from 10 to 150 oz. silver. A Huntington mill is on the property. The claims of the company are the Byron, The Spring Ledge Lode, Cabin and Fairview. Water is had in abundance. W. H. Dinsmore is the secretary. The office of the company is in Chicago.

NORTH CAROLINA.

Randolph County.

New Hoover Hill Gold Mining Company. Below the 130-ft. level the vein has narrowed, and a little ore is being produced. During April the mill ran 10½ days and crushed 194 tons of ore, yielding \$3-\$3 oz. gold.

Rowan County.

New Gold Hill Company, Limited.—On the 300 level the vein is 4 ft. wide. It contains some sulphurets but little gold.

OHIO.

Jefferson County.

Wheeling, Lake Erie & Pittsburg Coal Company.—This company is opening a new mine on Short Creek, near the Dillon mine, on the same seam with that mine, the Long Run and Laurelton mines, Saline County.

The Massillon "Miners' Independent" says that in the test well recently bored at Salineville, a 7 ft. seam of coal was encountered 71 ft. from the surface; at 168 ft. another seam of coal was found 6 ft. in thickness, and below this again two seams were struck, making 11 ft. more of coal. It is understood that preparation is being made to sink a shaft.

OREGON.

Baker County.

Bonanza Mining Company.—Three and a half days' run of the five-stamp mill produced \$2,163 in a partial clean-up recently.

White Swan.—The 10-stamp mill on this property is now running on half-time, and shaft sinking is progressing in the mine. In the gulch below the mine eight miners are making a clean-up; 400 ft. of ground was worked during the winter.

Virtue.—The 10-stamp mill on this property is running still and although the mine is not yet clear of water enough ore is being extracted to keep the mill fully supplied. The mine is said to be yielding about \$600 per day.

Josephine County.

During the past year 14 mills with a total capacity of 50 stamps have been erected in this county. The gold mining industry seems to be developing throughout Southern Oregon.

PENNSYLVANIA.

Anthracite Coal.

The rate of wages to be paid to the miners in the employ of the Philadelphia & Reading Coal and Iron Company, in the Schuylkill region, for the last two weeks of May and the first two weeks of June, has been fixed at \$2.39-7. This is 3% below the \$2.50 basis.

Burnside.—An explosion of gas occurred at the Burnside colliery, at Shamokin, on May 30th. One man was killed and several others were frightfully burned.

Middle Creek.—An explosion of gas occurred at this shaft, Pottsville, on May 20th. Several miners were severely injured.

York Farm.—A daring feat in mine engineering has just been accomplished at Pottsville—the tapping of the water in the abandoned Potts slope through the workings of York Farm colliery. The work of boring holes for this purpose has been going on for a year. The hole through which the water was tamped was finished May 30th, at a distance of 2,000 ft. from the bottom of the slope in the east gangway. The drill struck the water 70 ft. beyond the face of the gangway. It is estimated that there are 2,000 ft. of water in the gangways with a vertical height of 240 ft., but this great volume of water is now under control and can be lifted as rapidly as the pumps can handle it.

Bituminous Coal.

Berwind-White Coal Company.—It is reported that this company has just purchased the Weaver coal lands, in Paint township, Somerset County; consideration, \$8,000. The company now owns 4,000 acres in Cambria and Somerset counties. Other negotiations are pending and great activity in the near future is expected. The Johnstown "Herald" interprets these various signs as indicating that the Pennsylvania road will run a branch to the Somerset coalfields, either an extension of the South Fork branch or else a direct line from Johnstown.

SOUTH DAKOTA.

Lawrence County.

Craig Group.—Development work on this property has been going on for some months, and a number of veins from 3 to 20 ft. wide, averaging \$12 gold per ton, have been struck.

Milliken Park.—Operations in the tunnel, which is 1,500 ft. in, were suspended on account of lack of air, but will again be resumed, it is said; air shafts for the purpose of ventilation are being sunk.

Red Cloud.—The shaft is down 44 ft., showing a 7-ft. ledge on the bottom, 5 ft. of which is good ore.

TENNESSEE.

Tennessee Coal, Iron and Railroad Company.—The balance of Mr. de Bardeleben's holdings in this company have been sold to the Inman syndicate in New York. It is said that the price paid was about \$16 per share. Mr. de Bardeleben will

remain with the company as manager, but it will be controlled entirely by the Inman syndicate.

TEXAS.

(Reported for the "Engineering and Mining Journal.")

Jasper Marble Company.—Operations are being conducted on a small scale now, and money is being expended and tools for permanent work are being provided.

Piedras Negras.—From information we have received from a correspondent, the coalfield at Piedras Negras offers good opportunities of development, more so than those on the other side of the Rio Grande, since these being in the United States, the freight for crossing the bridge over the Rio Grande River, some 40c. a ton, and the duty of 75c. would be saved. The Southern Pacific Railroad, it is said, offers to take 500 tons of the coal daily if the field is opened up.

FOREIGN MINING NEWS.

MEXICO.

(Special Correspondence of Richard E. Chism, Propiedad Literaria reservada en la Republica Mexicana.)

CITY OF MEXICO, May 27.

The Secretary of Promotion, the department that has charge of mining, agriculture and colonization, has recently issued an important circular upon the latter subject. The circular is directed to the Governors of the States and recommends the convocation of, or rather an appeal to the patriotism and enlightenment of, the large landed proprietors, so that, after due meditation, they will cut up their great plantations into small lots to be sold to families of foreign colonists at reasonable prices, and to be paid for gradually in not less than twenty years' time; also, the Secretary of Fomento suggests that same landowners might furnish the colonists with beasts of burden, tools, seeds and other necessary material, to be paid for on long credits.

The landowners are to publish, through the State Government and the Promotion Department, schedules of the prices, location, climate, extent and conditions of their land for the information of all concerned, and, after being well fortified with data of this kind the Government will resolve whether or not to make the necessary efforts to attract to this country the European emigrants that have gone to other countries, now largely closed to them, up to the present time.

However laudable these efforts may be, there is great reason to fear that they will be unsuccessful.

The emigrants from Europe at the present time are very different from those of 40 or 50 years ago, who laid the foundations of the present prosperity of the United States. There is a prevailing and growing dislike to agricultural labor, even among the peasantry of Europe, and it is to be feared that many of the conditions here are not encouraging for that very particularly arduous form of the daily struggle of humanity against the elements.

Durango.

The case of Clark Birmingham against the Candelaria Mining Company, of San Dimas, came before the Supreme Court of Mexico some days ago, and it was determined that an injunction should not issue in favor of Mr. Birmingham for the ouster of the said Candelaria Mining Company, now represented by Mr. Daniel M. Burns. This decision of the Supreme Court leaves Mr. Birmingham with all his rights intact, but compels him to bring action before the State courts for their enforcement.

The Durango Iron and Steel Company is reported to have machinery on the road to enlarge their blast plant and to fully equip a rolling mill. A large iron pipe foundry is talked of in the near future. The works of this company are located, as has been often stated, just outside the gates of the city of Durango, and their ore comes from the celebrated Cerro del Mercado, or iron mountain. The plant has been in operation, more or less, for some years, but what it has actually accomplished I am not informed up to date. However, the iron is there, and now that there is a railway there ought to be no difficulty in making iron with some profit.

The Velardena Mining Company is an enterprise in which is largely interested Mr. J. F. Matthews, formerly of Denver, Colo. The mines are situated about 100 kilos, northeast of the capital of the State and about 75 kilos, southwest of Forreon Junction, where the lines of the Mexican Central and Mexican International railroads cross.

The line of the latter railroad, from Forreon to Durango, passes within nine kilometers of Velardena at a station called Pedrisena, and there is a spur of that length to make the connection with the main line. The property of the company comprises some 200 claims or hectares, and of course takes in the best of the district which the company has, in effect, discovered. Experienced mining men aver that the Velardena district is a Mexican Leadville. There are immense deposits of carbonate ores of low grade in silver, hence impossible to be exported but extremely profitable for on-the-spot smelting. The deposit is well defined, a contact between lime and porphyry, not horizontal, however, as in Leadville, but more generally vertical or at a steep angle with the horizontal.

The old workings have been extended to a length of 6,000 ft., and in some places the deposit is 100 ft. wide. Besides the great abundance of carbonates there is a notable excess of iron in the ore; and as the limestone that forms one side of the contact is not dolomite, but true lime, it still further increases

the value of the deposit for fluxing and smelting. To enrich the low grade carbonates the company has, on the other side of the San Lorenzo range, and quite near by, extensive silver mines with true fissure veins. One of these deposits is stated to have a record of \$20,000,000 yielded in times gone by, and for evidence there is an open cut several miles long and old workings whose average depth is about 100 meters, although in isolated cases they have been carried down to twice that depth. The average width of this great vein is only 2 ft., although in many places it is very much wider.

The company is now planning a series of shafts and drifts to get down below the points in both deposits where the ancients had to leave off for want of ventilation, and will soon have the property opened up in modern style. A large compressor plant is to be put in, and the work will be carried on with as little hand labor as possible.

Meanwhile there is a large amount of ore coming out of the mines as they are, and the company has a smelter with six stacks in operation, and their number will be increased as the circumstances warrant. The water from the mines is used to supply the smelters, and is a leading factor in the situation. At present the Velardena Mining Company has some 750 men at work, and the village that has grown up around the works contains some 3,000 souls. The ruling rate of wages is from 50 cents a day for laborers to \$1.00 a day for skilled miners, but the work is done by contract wherever possible, which is more advantageous for both parties and relieves the management from much annoying supervision. The reports about the class of labor employed, all Mexican as far as possible, are exceedingly good. The men are orderly and are faithful and steady workers. Appreciating the necessity of attaching their force to the place, the company has erected a model village for the accommodation of the workmen. The little town is laid off into wide, regular streets, along which are rows of well built and neat cottages. The water supply is piped in from some distance, and besides its uses for domestic purposes the surplus fluid is made to supply a range of neat bathhouses with hot and cold water on tap. The water serves for irrigation after passing through the baths.

The best sanitary conditions are enforced under the eye of the physician paid by the company; and as the climate is delightful, the health of the little community is very good.

The company also provides a schoolhouse with a competent teacher, and has built a church, which is, however, idle for want of a pastor. The general manager of the business is Mr. A. W. Geist, who has had long experience in this country, and who built the famous Guzenheim smelter at Monterey, Nuevo Leon.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see pages 526, 527 and 528.]

NEW YORK, Friday Evening, June 2.

The dullest week on record has passed in the mining stock market. The total number of shares sold at the Consolidated Stock and Petroleum Exchange was only 1,500, probably the smallest during any one week of the last decade. The holiday on Tuesday is, to some extent, accountable, and one or two sales of certain stocks on the list have been made which do not appear on the official record. However, the fact remains that the death-like quietude which prevails in mining stock circles just now is almost unparalleled. The public shows not the slightest interest in this market. Really, it is too much to expect that a better state of affairs should prevail, when various factors which directly affect trading in mining stocks are considered. In this city the general stock market monopolizes public attention to the exclusion of mining securities, and until the clouds which are hanging over the financial world are dispelled it is useless to look for an improvement. In San Francisco things apparently are drifting from bad to worse. Late advices from there indicate a general depreciation of values and a constantly decreasing volume of business. In Colorado the continued low price of silver is being severely felt by a great many mining properties, and the uncertainty as to the action of the next Congress regarding the Sherman law helps to increase the dullness in the local mining stock markets.

At the Consolidated Stock and Petroleum Exchange the only Comstock which was traded in during the week was Consolidated California & Virginia, of which 200 shares were sold at \$1.90. A glance at the San Francisco Stock Market printed elsewhere will show that to-day's opening prices are even lower than they were during the early part of the current week.

Of the California stocks only Brunswick shows sales this week. Of this stock 800 shares changed hands at 5c. Late news from the company's property is to the effect that the new pump is at work and that the water is now all out of the mine. Work is going on in the 600 and 700 levels. Another 50-ton lot of ore will be run through the mill at once. The ore is assorted and comes from the ledge in the 600 ft. level. The ledge is 6 ft. wide.

The only Colorado stock to show any sales this week was Leadville Consolidated. There was a fair inquiry for this stock, but actual transactions ag-

gregate only 300 shares at 15@16c. In our mining news columns will be found a report of the annual meeting of this company.

Phoenix of Arizona was also very quiet; the total sales amounted to but 200 shares at 10@12c.

Boston. June 1

(From our Special Correspondent.)

The past week has been the dulllest of the year in copper mining stocks. The sales at the Exchange only aggregate about 1,600 shares all told, and the tendency is to still greater dullness and lower prices. There is absolutely no disposition to speculate in them and the demand for investment is very light and is easily supplied. Calumet & Hecla is steady at \$290, all the sales being at this price.

Tamarack declined from \$143 to \$141, with recovery to \$141½.

Quincy was firmer and sold up to \$115 with one share at \$117.

Osceola was dull but steady at 27½ for small lot and \$27 for 100 shares.

A small lot of Franklin sold at \$12.

Centennial at \$6½ for 15 shares.

The Montana stocks showed a decided tendency for lower prices, although they were not much pressed for sale. Boston & Montana declined from \$22 to \$21½, and Butte & Boston lost ¼ to 6¼, with sales of 100 shares only for the week. Allouez sold at 40c., Wolverine at \$2½, and Tamarack, Jr., at \$16 for small lot.

3 P. M.—Up to the noon hour there was only one transaction in copper stocks on the Exchange, but just before the close a raid was made upon Boston & Montana, sending the price down from \$21½ to \$20, with recovery of only ¼ on the final sale. About 1,200 shares were sold. At the close \$20 was bid and \$20½ asked. The rights were offered at 12c., with but few takers. We cannot learn of any special reason for the decline, but are inclined to the opinion that it was for the purpose of reaching stop orders and getting cheap stock.

Osceola sold at \$27½ @ \$27 and Tamarack at \$142.

Denver. June 1

(From our Special Correspondent.)

The Colorado Mining Stock Exchange began on May 22d the calling of local stocks and bonds, including bank stocks, city railroad stocks, water companies' stocks, insurance stocks and state, county and city bonds.

The outlook for trading in these stocks warranted the Exchange having them called once a day, immediately after the last regular call of mining stocks.

Mining stocks at present are very quiet and generally weak. Trading is confined to gold stocks; only the very best of silver stocks can be handled at all.

San Francisco. May 26.

(From our Special Correspondent.)

Mining stocks have fluctuated with considerable activity during the week, but the general tendency of the market has been downward. This afternoon there was a short rally, prices advancing along the line of Comstocks, but in no instance did prices advance to the ruling rates of last week.

The first of a series of legal contests resulting from the difficulties in which the Santa Clara Bank has been involved was filed to day. O. R. Jones, a stock-broker, sues G. Y. Bollinger, as receiver of the estate of H. M. Leonard, and F. E. Hayward, as special administrator of the estate C. C. Hayward. The complaint states that plaintiff holds in the name of C. C. Hayward 300 shares Ophir stock, 200 shares Consolidated California & Virginia stock, 300 shares Mexican stock, 300 shares Gould & Curry stock, 100 shares of Savage stock and 300 shares of Belcher stock, together with \$309 in cash. The plaintiff while holding the above stock alleges that he is unable to determine the ownership, as it is also claimed in whole or part by the insolvent estate of H. M. Leonard and by the estate of Hayward. These shares are the residue of the big account of 40,000 shares of Comstocks thrown on the market last week and which so demoralized the market. The court is asked to determine ownership.

The North End Comstocks have not been in great demand, and to-day the ruling rate for Consolidated California & Virginia has been \$1.35, a 20-cent decline on the week. Ophir has shown more strength, opening this morning at \$1.60, and advancing 10 cents during the day, closing steady. Mexican sold for \$1.15, Sierra Nevada for 80 cents, and Union Consolidated for 80 cents.

In the middle group of Comstocks Potosi continues to be eagerly watched, and, albeit the bear element have tried to break prices, the ruling rate to-day was, at the close, \$2.30, as compared to \$2.10 a week ago. Alvinza Hayward professes confidence in the probability of striking the hanging wall of the old Belvidere ledge, the ledge from which Requa took such quantities of ore; on the 930 level the face of the north drift from the east crosscut shows 5 ft. of good ore; and an upraise will soon be started on this ore. A drift will also be run on the 830 level to tap it. Best & Beecher sold to-day for \$1.05; Chollar for 90 cents; Gould & Curry for 70 cents; Hale & Norcross for 55 cents; Savage for 65 cents.

A couple of weeks ago anticipations of good things on the 1,100 level of Yellow Jacket stimulated the price of the stock. The joint Kentuck and Jacket drift on this level was in high grade ore, but for some reason no further news has been heard, and

prices have sagged back. Jacket to-day sold for 75 cents and Kentuck for 10 cents, but it is noticeable that at these figures the stock is being quietly gathered in, so perhaps these prices will take a change for the better. Belcher sold to \$1.05, Chollar to 80 cents, Crown Point for 60 cents, Overman for 10 cents, Seg Belcher for 10 cents, Occidental for 5 cents, and Justice for 5 cents.

Of the outside stocks 200 Mayflower changed hands at \$200, Bodie Consolidated was had for 25c., Bulwer Consolidated 15c. bid and Mono 10c. bid. Of the Tuscaroras quotations were as follows: Belle Isle, North Commonwealth and North Belle Isle were all bid for 10c; Commonwealth, 5c. asked; Grand Prize and Nevada Queen, 5c. bid, and Navajo, 10c. bid. In the Quijotoas Peer and Peerless were had for 5c. and Silver King for 25c.

London. May 23.

(From our Special Correspondent.)

The past week has been a very unimportant one on account of the holidays. For the ten days from three days before Whitsunday to the end of Whit-week nothing new is ever put on the market, and the publication of monthly and other mine reports is postponed to a time when the public have recommenced the reading of newspapers and circulars. The less space this report occupies the better, seeing that there is very little to say.

The exchanges during the days at the end of last calendar week—that is, May 17th, 18th and 19th—saw some violent fluctuations in mining shares. These fluctuations were caused by the personal troubles of the brokers and jobbers, and had nothing to do with the mines. Most of the shares recovered their price of last week. Among legitimate business New Gostons found buyers, and the price of this stock is strengthening and recovering somewhat from the rude shock it received after the publication of last year's report. A great many followers of the market express confidence in the management, and hold out hopes for future, though reduced, dividends. Holcomb Valleys have found buyers, but the price is as yet unaltered from last week's quotation. Elkhorns have lost ground a little, but this is probably only a reaction after the rise a week or so ago on the strength of an improved report. Jay Hawks and Golden Feathers have improved a trifle during the week.

A company has been registered, though not yet put before the public, entitled "Jackson's Goldfields, Limited," to work properties not specified in the State of California. Colonel Lean, R. A. Boulton and F. M. Eden are named as the directors. No information is forthcoming. The capital of the company is £250,000.

DIVIDENDS.

Mollie Gibson Consolidated Mining and Milling Company, dividend No. 35, of fifteen cents per share, \$150,000, payable June 15th, at the office of the company, in Colorado Springs, Colo. Transfer books close June 5th and reopen June 16th.

Rico-Aspen Consolidated Mining Company paid dividend No. 1, of two and one-half cents per share, \$25,000, May 15th, at the office of the company, Tabor Block, Denver, Colo.

MEETINGS.

Quicksilver Mining Company, at the office of the company in New York, June 21st, at 1 P. M. Transfer books close June 12th and reopen June 22d.

Boston & Montana Mining Company, at the office of the company in Boston, Mass., June 21st, at 12 o'clock noon.

Jordan Mining Company, at the office of the company in New York, June 5th, at 2 P. M.

Pennsylvania Coal Company, at the office of the company in Dunmore, Pa., June 6th, at 11 A. M.

Rossie Iron Works, at the office of the company in New York, June 7th, at 12 o'clock noon.

METAL MARKET.

NEW YORK, Friday Evening, June 2, 1893.

Prices of Silver per Ounce Troy.

May	St. Ex.	London	Pence	N. Y. Cts.	Value of sil. in \$1.	May	St. Ex.	London	Pence	N. Y. Cts.	Value of sil. in \$1.
27	4'85½	37¾	82½	638	31	4'89¼	37¾	82¾	637		
29	4'89¼	37¾	82¾	639	Jun 1	4'89	37¾	82½	638		
30	H'day	57¾	...	...	2	'89	37¾	82½	639		

Silver has been depressed owing to the high rates of money in London, Indian banks not being willing to buy except at concessions in price. Easier money the last two or three days has had the effect of stiffening the price and market closes firm. The report of Lord Herschell's committee is awaited with considerable interest.

The United States assay office at New York reports the total receipts of silver for the week to be 101,000 ounces.

Government Silver Purchases.

The Government has purchased during the week the following quantities of fine silver at the accompanying prices per fine ounce:

May 29th, 100,000 oz., at \$2'88c.
May 31st, none.
June 2d, 620,000 oz. at 83c. to 83'05c.

Coinage at the Mints of the United States.

The following report shows the coinage executed at the mints of the United States during May:

Denomination.	Pieces.	Value.
Double eagles ..	619,020	\$1,298,040.00
Eagles.....	1,027,000	1,027,000.00
Half-eagles.....	16,000	50,000.00
Total gold.....	781,720	\$2,375,040.00
Standard dollars.....	137,000	\$137,000.00
Half-dollars.....	194,000	97,000.00
Quarter-dollars.....	2,390,000	597,500.00
Dimes.....	2,100,000	210,000.00
Total silver.....	4,791,000	\$1,081,500.00
Five cents.....	1,518,000	\$75,900.00
One cent.....	4,070,000	40,700.00
Total minor.....	5,588,000	\$116,600.00
Total coinage.....	11,140,720	\$3,525,640.00

Gold and Silver Exports and Imports at New York, Week Ending May 27th, 1893, and for Years from January 1st, 1893, 1892.

	Gold.		Silver.		Excess of Exports.
	Exports.	Imports.	Exports.	Imports.	
Week.....	\$1,539,982	\$31,533	\$92,055	\$9,431	\$5,188,473
1893.....	61,328,588	5,716,997	12,254,049	1,157,192	66,699,022
1892.....	23,627,644	6,122,141	9,743,779	553,743	25,695,539

The exports were to England and the imports from South America and the West Indies.

During the five days ending June 2d the exports and imports as far as ascertained have been as follows: Exports, gold, \$5,000,000; silver, \$467,000. Imports, gold, \$96,434; silver, \$1,959. The gold exported went to Europe, silver likewise. Of the imports \$83,000 was bullion from Havana. Shippers state that \$1,000,000 will surely be sent to-morrow and perhaps more.

NOTES OF THE WEEK.

We have already drawn attention to the fact that the pro-silver sentiment from the West is gradually changing; in our last issue we gave a synopsis of the resolution adopted by the Texas Bankers' Association favoring a repeal of the Sherman Act. Since then the Commercial Club of St. Louis, Mo., has unanimously adopted a resolution which in still stronger language advocates the repeal of the Silver Purchase Act. It is as follows:

"Whatever opinions may have been entertained as to the wisdom or necessity of the enactment under circumstances existing at the time, the purchase of silver bullion and issue of coin notes under the provisions of the Act of 1890, known as the Sherman Act, are now only productive of evil in our monetary system and disturbance to the national credit, and the prosperity of the whole country, agricultural, manufacturing and commercial, will be in a great degree promoted by its early and unconditional repeal." The word "unconditional" invites special attention, for time and again it has been stated that no repeal of the bill was possible unless the Western silver men were appeased by a compromise of some kind, such as the re-enactment of the Bland Act, or the repeal of the 10% tax on State bank circulation.

A similar resolution was passed by the New York Chamber of Commerce at its regular monthly meeting held Thursday, June 1st. The resolution, which was introduced by J. Edward Simmons, President of the Fourth National Bank, was as follows:

"Resolved, That it is the opinion of this Chamber that the Sherman silver purchase law should be repealed by Congress at the earliest possible date; that it is apparent to all that under the operations of said law great injury is being done to the financial and commercial interests of our whole country, and that confidence will not be restored until the said bill is repealed."

Meanwhile the outward movement of gold continues with unabating force. During the week ending May 27th \$4,600,000 in gold was exported, and \$5,000,000 has already gone out during the present week. The gold now held by the Treasury, according to its statement of June 1st, is \$96,158,979, but this does not reflect the shipment of some \$2,000,000 on May 31st, and at present the gold held cannot be greater than \$93,000,000.

According to a dispatch received from Washington, shipments will probably continue until the gold balance is reduced to \$81,000,000, but this seems an arbitrary limitation in the face of our article of last week, showing the amount of our current indebtedness to Europe. The lower the gold holdings become the greater the resulting distrust and consequent shipments, for as the gold decreases demand liabilities for it increase and will continue to do so until Treasury notes cease to be issued for purchases of silver. As it is at present, our gold reserve is only about 8% of our paper. At present the Treasury is receiving but little gold, no new offerings being made by the National Banks. In times past a large amount was received through the Custom House, but such is not now the case. For example, during the week ending May 31st, the duties paid at the New York Custom House amounted to \$2,058,140. The money received for this was classified as follows: Gold coin, \$1,742; gold certificates, \$400; treasury notes, \$120,950; checks, \$1,784,140; legal tenders, \$70,000; silver coin, \$769; silver certificates, \$67,650.

The figures for the month of May, as compared

with those for the corresponding month of former years, are still more instructive.

Collections at Port of New York. Table with columns: Collected, Gold, Silver, Gold certificates, Silver certificates, Greenbacks, Treasury notes. Rows for years 1889-1893.

WASHINGTON, June 1.—The statement of the United States Treasurer showing the classified assets of the Treasury and demand liabilities on June 1st is as follows:

Assets and Liabilities table. Assets include Gold coin and bullion, Silver dollars and bullion, etc. Liabilities include Gold certificates, Silver certificates, etc.

This statement does not reflect the shipment of gold on Wednesday, May 31st.

The government receipts during the month of May were \$30,971,497 and the expenditures \$30,872,502. In April the receipts were \$28,599,942 and the expenditures \$33,771,265. Customs receipts increased from \$15,418,637 to \$15,424,853. Internal revenue receipts increased from \$11,799,367 to \$13,212,103. Payments on account of pensions increased from \$12,871,761 to \$14,268,020.

The London "Financial Times" calls attention to what it describes as a unique transaction in the monetary history of our time. It says: The National Bank of Belgium whose policy is quite mono-metallist, and which, consequently, desires to hold as much gold as possible, has sent not less than 10,000,000 francs in gold to the Bank of France, and has demanded five franc pieces in silver for them.

In a former article (January 21st, 1893), we showed that at the beginning of the present year the Bank of France held packed and ready for shipment, 204,000,000 francs in Belgian, 132,000,000 francs in Italian, 4,000,000 francs in Swiss and 2,000,000 francs in Greek, five-franc silver pieces, besides 10,000,000 in foreign fractional silver coin.

The report of the Free State delegates to the South African Mint Conference held at Pretoria in February recommends the adoption of the convention which was accepted by the representatives of Cape Colony, Natal and the Free State, the Transvaal delegate alone refusing his assent.

According to the New York "Sun," Herr Mauthner, director of the Austrian Creditanstalt, explains that of the 100,000,000 florins required for the 4% loan, about 60,000,000 were obtained in March by purchasing American eagles.

A statement issued by Comptroller Eckels shows that from January 1st to June 1st of the present year 20 National Banks with a total capital of \$6,150,000, have failed, as against seven National Banks with a capital of \$625,000 for the corresponding five months of 1892. The present indications are that

still more failures will occur. Bankers report a strong movement of currency to the interior and the demand for re-discount on the part of country banks continues heavy. Money is still high, bringing 6 1/4% to 9% on time and 2 1/4% to 4% on call.

The Mexican government has imposed a stamp tax of 3 cents for every \$5 worth of gold and silver coined in or exported from the Republic to take effect immediately. The tax is expected to add \$300,000 a year to the revenue.

The specie holdings of European banks at the end of May were as follows:

Table showing specie holdings of European banks at the end of May 1893, comparing May 25, 1893 and May 26, 1892. Banks include Bank of England, France, Germany, etc.

The London "Statist," in commenting upon the increase in the rate of discount by the Bank of England and the necessity of maintaining it not increasing, the gold reserve, says: "It is mainly to New York we must look for abundant supplies. Of course, the need to take gold from New York is unfortunate, for every shipment from New York deepens the currency crisis on the other side of the Atlantic, and so, by-and-by, will react upon ourselves. But that is a misfortune which, as things stand, cannot be avoided.

Domestic and Foreign Coin. The following are the latest market quotations for the leading foreign coins:

Table of domestic and foreign coin market quotations including Mexican dollars, Peruvian soles, Victoria sovereigns, etc.

Copper.—Although the market is very dull indeed, those who would purchase Lake copper at less than 11c. have failed in their efforts to get it, and while toward the close of last week and the opening of this there existed a good demand for such copper for immediate delivery there is none now.

Electrolytic copper has been rather pressed for sale, the choice brands still commanding from 10 1/2% to 10%, the inferior ones selling at below 10 1/2%.

Consumption continues at a very fair rate, and consequently deliveries are quite good, but owing to the unwillingness of foreign buyers to pay the prices asked the business in copper for export has not amounted to a great deal of late.

The London market has been rather flat, prices ranging from £43 10s. to £42 15s., closing somewhat better at £43 5s. @ £43 7s. 6d. for spot and 10s. more for futures, refined and manufactured sorts being quoted as follows:

English tough, £46 5s. @ £46 15s.; best selected, £47 10s. @ £48; strong sheets, £54 @ £55; India sheets, £51 @ £51 10s.; yellow metal sheets, 4 1/4 d.

Abroad, there exists for furnace material a very good demand which can only in part be filled. The statistics for the last half of May show a decrease in visible supplies of 300 tons.

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

Table showing exports of copper from the port of New York to Liverpool, Bristol, Hamburg, Bremen, etc.

Tin.—The market is flat because of heavy arrivals, a great part of which go into weak hands and, consequently, in the present state of the money market, have to be disposed of at best possible prices, which have declined until the close, which is at 19 9/5 @ 20c.

have ceased or the duty comes into full force and effect.

In London the idea seems to be to unload upon this market whatever can possibly be gotten rid of and shipped prior to the 10th instant, as after that date, for at least several months, not a pound of metal is likely to be brought in.

Lead.—After closing last week at 3 1/2 @ 3 9/10 there was a very good demand existing and some of the buyers who had put off purchasing just a bit too long were compelled to pay rather stiff prices, which went as high as 3 9/25 @ 3 9/5.

Abroad, prices have also given way, sales of Spanish lead having been made at £3 6s. 3d. @ £3 7s. 6d., while the quotation for English is £9 10s.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: "Lead steady at 3 67/8 c., with just about as many buyers as sellers at that price."

Spelter.—Quite a rapid change took place in the market for this metal. A week ago plenty of it was pressed for sale, but consumers would not buy, waiting in the hope of getting in still lower, but the strike which has closed most of the Missouri and Kansas coal mines has also closed some of the spelter smelters, and the price fully shows it.

In the London market good ordinaries are quoted at £17 17s. 6d., and specials at £18 2s. 6d.

Antimony is rather flat, Cookson's at 10%, L.X. at 10 1/2% and Hallett's at 9 9/5 @ 10c.

Nickel is without alteration, but there is a feeling that the French makers, being annoyed at the entry of American made nickel into their markets, will retaliate here.

Quicksilver.—There is nothing new to report. Quotations are: New York, \$39.50; London, £6 15s.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 2, 1893. Pig Iron Production.

Table of Pig Iron Production showing fuel used (anthracite, coke, charcoal) and totals for June 2, 1892 and June 2, 1893.

Pig Iron.—June opens with the pig iron market in about the same condition in which it was a month ago. The trade during the past week has been characterized by the same old dullness—indeed, a thorough canvass of the entire iron trade hereabouts shows that, if anything, the closing week of May was even quieter than usual.

There have been, as usual, rumors of sales at prices lower than those currently reported, but it is difficult to verify these rumors. The accused parties will always deny that they have been guilty of shading their figures.

With the present financial troubles, difficulty of collections, stringency in the money market and other disquieting tendencies prevailing in the business world, the prospects for higher prices for pig iron are indeed remote.

Prices are without change from last week. We quote: Northern brands: No. 1, \$14.50 @ \$15.25; No. 2, \$13.75 @ \$14.50; Gray Forge, \$12.50 @ \$13.00; Southern: No. 1, \$14 @ \$15; No. 2 F., \$13 @ \$13.50; No. 1 soft F., \$13.25 @ \$14; Gray Forge, \$12 @ \$12.50.

Billots and Rods.—There is not much actual business doing in this market. We quote: Steel billots, tidewater, \$24 @ \$25; foreign, \$28.50 @ \$29; wire rods, \$33.50 @ \$34; foreign, \$40 @ \$40.50; Swedish, \$52 @ \$53.

Manufactured Iron and Steel.—Some sales have taken place this week, but no single large transaction is reported. Prices continue low. We quote: Angles, 1 1/2 @ 2c.; axles, scrap, 1 9/10 @ 2 1/10c.; delivered; steel, 1 85 @ 2c.; bars, common, 1 50 @ 1 60c.; refined, 1 65 @ 1 9c. on dock; beams, up to 15 in., 1 80 @ 2c.; 20 in., 2 10 @ 2 30c.; car truck channels, 2 @ 2 10c.; channels, 1 90 @ 2 10c. on dock; hoops, steel, 1 8 @ 1 9c., delivered; links and pins, 1 85 @ 2 10c.; plates, bridge, 2 @ 2 10c.; firebox, 2 5 @ 2 8c.; flange,

were placed by dealers prior to the strike and immediately after resumption of work, when a vast amount of coal was rushed into the market. Prices on good coal are not shaded to any great extent.

Coke is in very great demand, as many foundries are either shut down or working short time on account of dullness in iron circles.

Quotations are: \$4.65 furnace; \$5.05 foundry crushed; \$5.40 Connellsville; West Virginia; \$3.90 furnace, \$4.10 foundry; New River Foundry, \$4.65; Walston; \$4.65 furnace, \$5 foundry.

Circular prices are at the following rates: Lehigh lump, \$6.25; large egg, \$5.60; small egg, range and chestnut, \$5.85. Retail prices per ton are: Large egg, \$7; small egg, range and chestnut, \$7.

Prices of bituminous per ton of 2,000 lbs., b. o. b. Chicago, are: Pittsburg, \$3.35; Hocking Valley, \$3; Younghoeheny, \$3.25; Illinois block, \$2.50; Brazil block \$2.50.

Pittsburg. June 1.

(From our Special Correspondent.)

Coal.—The shipments by the Ohio River are over for the present. The boats are on their way home with empties, which will keep the mines in the pools employed for some time, at least until the June run comes. The shipments were: Cincinnati, 5,425,000 bushels; Louisville, 9,357,000 bushels; total, 14,812,000 bushels. The "Joseph B. Williams" arrived at New Orleans with 950,000 bushels of coal, taken from the pools on the Monongahela. It required 9 1/2 acres to supply that amount of coal and is the largest tow that was ever taken by one boat at one time. The lower markets have an abundant supply on hand. The Pocahontas Coal Company is reported to be cutting prices at Cincinnati, and there is a prospect of a fight there.

Connellsville Coke.—Trade is beginning to rouse itself from the lethargy in which it has been for several weeks and now shows signs of improvement. The chief factor in the improved trade last week was the operations of the Frick company; they are fixing up their idle ovens and ran full time, but how long the coke trade will stand this is hard to tell. At present no coke is being stocked by them. The small operators in the region seem to be feeling the effects of the increased production of the large companies. The activity of the blast furnaces in the Pittsburgh district is the cause of the Frick company's good running time and the general improvement of their trade. For the past two months W. J. Rainey has been looming up as the second largest producer in the region. The shipments for the week aggregated 123,861 tons, distributed as follows: To Pittsburg and river points, 1,944 cars; to points

west of Pittsburg, 3,000 cars; to points east of Scottsdale, 1,575 cars; total, 6,519 cars. Shipments decreased as follows: Pittsburg, 33 cars; Western shipments, 140 cars; Eastern shipments, 64 cars, a total decrease of 237 cars. Prices unchanged.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, June 2.

Heavy Chemicals.—The dullness which has prevailed in the heavy chemical market shows no abatement. Every article in the list has been devoid of activity. Glass makers are about to extinguish their fires and carbonated soda ash and alkali are naturally very dull. Caustic soda shows absolutely no change, either as to position or as to prices. Soda ash and bleaching powder are both quiet. Generally speaking, it may be said that what business is doing in this market at present is confined to deliveries on existing contracts. Shipments of heavy chemicals from England to the United States during the first four months of 1893 have been as follows: caustic soda, 10,408 tons, as against 8,863 tons for the corresponding period of 1892; carbonated soda ash, 23,062 tons, compared with 18,906 tons; sal-soda, 1,868 tons, against 1,998 tons; salt cake, 6,555 tons, against 4,129 tons; crystal carbonate, 869 tons, as against 573 tons for the same period of 1892. Our quotations this week are as follows: We quote: Caustic soda, 60%, 2.95@3.10c; 70%, 2.70@2.80c; 74%, 2.72@2.82c; 76%, 2.80@2.90c. Carbonated soda ash, 48%, 1.25@1.30c; 58%, 1.25@1.30c. Alkali, 48%, 1.25@1.30c; 58%, 1.20@1.25c. According to package. Sal soda, English, on the spot, 1c. American, '90@'95c; bleaching powder, 2.25@2.37c.

Acids.—There is nothing new to report of the acid market. The demand for the various acids keeps up as usual, and there is little new business doing. The great bulk of the deliveries are on old contracts. Prices, despite all rumors of cutting, especially in the case of sulphuric acid, continue unchanged. Our quotations are as follows: Acid, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, 1.87 1/2@2, according to quality; muriatic, 18, 90c@1.10; 20, 91c@1.25; 22, 91.25@1.30; nitric, 40, 91; 42, 91.50@1.75; sulphuric, 80c@1.10; mixed acids, according to mixture, oxalic, \$6.30@6.50. Blue vitriol is quoted all the way from \$3.35 to \$3.75; glycerine for nitroglycerine, 11 1/2@12 1/2c, according to quality and quantity.

Brimstone.—The brimstone market has been very quiet during the past week. Quotations are as fol-

lows: On the spot, best unmixed seconds, \$19.50; thirds, \$18.75; forward shipments (May June and June-July), \$19.00 for best unmixed seconds, and \$18.25 for thirds.

Fertilizing Chemicals.—This market is in precisely the condition reported in our last issue, dull and quiet. Owing to the high prices which have prevailed this year many manufacturers have not bought as formerly, but are holding off, as far as practicable, in expectation of a decline. Business has not been very active. Prices are somewhat easier but without any change of consequence. Our quotations this week are as follows: Dried blood, \$2.55@2.60 per unit for high grade, and \$2.45@2.50 for low grade; azotine, \$2.50@2.60; sulphate of ammonia \$3.15@3.20 for gas liquor. No bone liquor is offering. Concentrated phosphate (30% available phosphoric acid), 75c per unit. Acidulated fish scrap, no stocks on hand; dried scrap is quoted at \$28 f. o. b. fish factory. The fishing boats have been out for the past 10 days and have done nothing. Tankage, high grade, \$27@29; low grade, \$26@28. Bone tankage, \$24@25; bone meal, \$24@25.50.

The price of double manure salts as fixed by the syndicate is as follows: New York and Boston, \$1.12; Philadelphia, \$1.14; Charleston and Savannah, \$1.17 cwt., basis 48@50% in 50 ton lots on foreign weights and analyses. Sulphate of potash, 90%-96% basis, 90%; New York and Boston, \$2.07; Philadelphia, \$2.09 1/2; Charleston and Savannah, \$2.12, sulphate of potash, 96-99% basis 90%, is 4% higher.

Phosphates.—Quotations for high grade land rock f. o. b. Charleston, are \$1.50@1.75. Freight are \$2.25.

Muriate of Potash.—Arrivals during the past fortnight aggregate 750 tons, all of which went into immediate consumption. There is no new business to report. The prices fixed by the syndicate for 1893 are as follows: New York or Boston, \$1.75; Philadelphia, \$1.80 1/2; Southern ports, \$1.8.

Kainit.—This market is very quiet. Quotations for shipments previous to September are as follows: New York, Philadelphia and Boston, \$8.75 for foreign invoice weight and test, and \$9 for actual weight; Charleston, Savannah and Wilmington, \$9.50 for invoice weight and test, and \$9.75 for actual weight. Shipments after September 1st, 15% higher.

Nitrate of Soda.—The conditions prevailing in the nitrate market at the time of our last report continue unchanged. The result of the dull trade and competition has been a slight decline; and quotations for goods on the spot are \$1.85@1.90.

CURRENT PRICES.

Table listing current prices for various commodities such as Alcohol, Alum, Ammonia, Muriate, Aqua Ammonia, Antimony, Argols, Arsenic, Asbestos, Ashes, Asphaltum, Barium, Bauxite, Bichromate of Potash, Bichromate of Soda, Borax, Bromine, Cadmium, Caustic, China Clay, Chlorine Water, Chrome Yellow, Chrome Iron Ore, Chromalum, Cobalt, Copper, Vitriol, Nitrate, Copperas, Corundum, Cryolite, Emery, Epsom Salt, Feldspar, Fluorspar, French Chalk, Fuller's Earth, Glauber's Salt, Glass, Gold, Kaolin, Lead, Litharge, Magnesite, Manganese, Mercuric Chloride, Marble Dust, Metallic Paint, Mineral Wool, Mica, Nitre Cake, Ochre, Washed Nat Oxf rd, Powder, Golden, Domestic, Oils, Mineral, Phosphorus, Platonic Chloride, Pumice, Potassium-Cyanide, Bromide, Caustic, Iodide, Nitrate, Bichromate, Red Prussiate, Pumice Stone, Pyrites, Quartz, Rotten Stone, Kaolin, Kieserite, Lead, Litharge, Magnesite, Manganese, Mercuric Chloride, Marble Dust, Metallic Paint, Mineral Wool, Mica, Nitre Cake, Ochre, Washed Nat Oxf rd, Powder, Golden, Domestic, Oils, Mineral, Phosphorus, Platonic Chloride, Pumice, Potassium-Cyanide, Bromide, Caustic, Iodide, Nitrate, Bichromate, Red Prussiate, Pumice Stone, Pyrites, Quartz, Rotten Stone.

Table listing current prices for various commodities such as Marble Dust, Metallic Paint, Mineral Wool, Mica, Nitre Cake, Ochre, Washed Nat Oxf rd, Powder, Golden, Domestic, Oils, Mineral, Phosphorus, Platonic Chloride, Pumice, Potassium-Cyanide, Bromide, Caustic, Iodide, Nitrate, Bichromate, Red Prussiate, Pumice Stone, Pyrites, Quartz, Rotten Stone, Kaolin, Kieserite, Lead, Litharge, Magnesite, Manganese, Mercuric Chloride, Marble Dust, Metallic Paint, Mineral Wool, Mica, Nitre Cake, Ochre, Washed Nat Oxf rd, Powder, Golden, Domestic, Oils, Mineral, Phosphorus, Platonic Chloride, Pumice, Potassium-Cyanide, Bromide, Caustic, Iodide, Nitrate, Bichromate, Red Prussiate, Pumice Stone, Pyrites, Quartz, Rotten Stone.

Table listing current prices for various commodities such as Talc, American No. 1, American No. 2, Terra Alba-French, English, American No. 1, American No. 2, Tin-Crystals, Muriate, Single, Double or strong, Oxymur, or nitro, Vermilion, Am. quicksilver, Am. quicksilver, bags, Chinese, Trieste, American, Zinc White, Antwerp, Red Seal, Paris, Red Seal, Muriate solution, Sulphate crystals, Aluminum, Arsenic, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Glucinum, Indium, Iridium, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Niobium, Niobium, Osmium, Palladium, Potassium, Rhodium, Rhenium, Rubidium, Selenium, Sodium, Strontium, Tantalum, Tellurium, Thallium, Titanium, Thorium, Tungsten, Uranium, Vanadium, Yttrium, Zirconium.

Table listing current prices for various commodities such as Talc, American No. 1, American No. 2, Terra Alba-French, English, American No. 1, American No. 2, Tin-Crystals, Muriate, Single, Double or strong, Oxymur, or nitro, Vermilion, Am. quicksilver, Am. quicksilver, bags, Chinese, Trieste, American, Zinc White, Antwerp, Red Seal, Paris, Red Seal, Muriate solution, Sulphate crystals, Aluminum, Arsenic, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Glucinum, Indium, Iridium, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Niobium, Niobium, Osmium, Palladium, Potassium, Rhodium, Rhenium, Rubidium, Selenium, Sodium, Strontium, Tantalum, Tellurium, Thallium, Titanium, Thorium, Tungsten, Uranium, Vanadium, Yttrium, Zirconium.

THE RARER METALS.

Table listing current prices for various commodities such as Aluminum, Arsenic, Barium, Bismuth, Cadmium, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Glucinum, Indium, Iridium, Lanthanum, Lithium, Magnesium, Manganese, Molybdenum, Niobium, Niobium, Osmium, Palladium, Potassium, Rhodium, Rhenium, Rubidium, Selenium, Sodium, Strontium, Tantalum, Tellurium, Thallium, Titanium, Thorium, Tungsten, Uranium, Vanadium, Yttrium, Zirconium.

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

Table with columns for Name and Location of Company, dates from May 27 to June 2, and Sales. Lists various mining companies like Adams, Alice, Amador, etc.

*Ex-dividend. †Dealt at in New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 500. Non-dividend shares sold, 1,000. Total shares sold, 1,500.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, dates from May 26 to June 1, and Sales. Lists various mining companies like Atlantic, Bodie, Bonanza Development, etc.

Dividend shares sold, 2,350. Non-dividend shares sold, 415. Total shares sold, 2,465.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Large table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, and Dividends. Lists companies like Adams, Alaska-Treadwell, Alice, etc.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Name and Location of Company, Capital Stock, Shares, 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 \$42,390,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$190,000 before the reorganization in 1880. ‡‡ This company acquired the property of the Raymond & Ely Company which had paid \$3,075,000 in dividends. **** Previous to this company's acquiring Northern Belle, that mine declared \$2,400,000 in dividends against \$423,000 in assessment.

COAL AND COAL RAILROAD STOCKS.

Table with columns: NAMES OF STOCKS, May 27, May 29, May 30, May 31, June 1, June 2, Sales. Lists various coal and railroad stocks with their respective prices and sales figures.

Total shares sold, 308,397.

INDUSTRIAL AND TRUST STOCKS.

Table with columns: NAME OF STOCKS, May 27, May 29, May 30, May 31, June 1, June 2, SALES. Lists industrial and trust stocks with their prices and sales.

Total sales, 291,235.

CALIFORNIA.

Table for California stocks, including San Francisco and Colorado Springs. Columns: NAMES OF STOCKS, CLOSING QUOTATIONS (May 27, May 29, May 30, May 31, June 1, June 2).

Colorado Springs. May 20.

Table for Colorado Springs stocks. Columns: Bid, Asked. Lists various stocks with their bid and asked prices.

Denver.

Table for Denver stocks. Columns: Prices and sales for the week ending May 27th. Lists High, Low, and Sales figures for various stocks.

Rico. May 27.

Table for Rico stocks. Lists various stocks with their prices and sales figures for May 27.

MARYLAND.

Table for Maryland stocks, Baltimore. Columns: COMPANY, Bid, June 1, Asked. Lists various companies with their bid and asked prices.

MINNESOTA.

Table for Minnesota stocks, Duluth. Columns: Bid, Asked, May 26. Lists various companies with their bid and asked prices.

Table for Minnesota stocks, Unlisted. Lists various unlisted stocks with their bid and asked prices.

Table for Noria Mining Co. and other stocks. Lists various companies with their bid and asked prices.

SOUTH DAKOTA.

Table for South Dakota stocks, Deadwood. Lists various companies with their bid and asked prices.

Pipe Line Certificates.

Table for Pipe Line Certificates. Lists various certificates with their high, low, and sales figures.

London Quotations.

Table for London Quotations. Lists various international stocks with their buyer and seller prices.

MISSOURI.

Table for Missouri stocks, St. Louis. Lists various companies with their bid and asked prices.

MONTANA.

Table for Montana stocks, Helena. Lists various companies with their bid and asked prices.

PENNSYLVANIA.

Table for Pennsylvania stocks, Philadelphia. Lists various companies with their bid and asked prices.

Pittsburg.

Table for Pittsburg stocks. Lists various companies with their bid and asked prices.

Paris.

Table for Paris stocks. Lists various international stocks with their prices.

ASSESSMENTS.

Table for Assessments. Lists various companies with their assessment details, including company name, number, date, and amount.