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CONTENTS.

Table with 3 columns: Article Title, Page, and Page. Includes sections like Headquarters of the Mining Industry, The Metric System, Intelligent Finance, Company Registration in England During 1895, etc.

Headquarters of the Mining Industry.

Visitors to New York will find at the offices of The Engineering and Mining Journal, 253 Broadway, files of papers from the mining districts of this and other countries, books of reference and every convenience for correspondence. They can also have their letters addressed in care of The Engineering and Mining Journal, P. O. Box 1833, New York.

All are cordially invited to make use of these facilities.

Metric System.

There seems to be the possibility of a bill being passed enforcing the use of the metric system of weights and measures. The report of the committee of the House has been made entirely in favor of this measure, and it is clearly shown that the Troy pound of the mint is resorted to as the only source from which to derive the avoirdupois pound for common use.

The simplicity of the system is, of course, its best recommendation, and from a mathematical point of view recommends itself to anyone who has had the advantage of a common school education. Judging from the ease with which the change has been made in other countries, there should be no trouble here, Germany having changed to the compulsory system in two years and Austria in three, without friction or trouble.

The convenience of the system is well illustrated by the movement now on foot between the makers and users of screws throughout the world, to have the threads adjusted to a common metric measure.

Intelligent Finance.

A valued correspondent comments upon our editorial remark on the subject of "Intelligent Finance," and it is just possible that in speaking of the United States Treasury we placed too much of the blame on that department for the lack of business methods in taking advantage of the credit that this country should enjoy.

Our correspondent (possibly only for the sake of example) refers to 2 1/2 per cent. French Rentes, of which we have never heard, as they do not exist, and we are sure that he is not correct in his views that any Englishman of a thrifty nature (and most of them belong to this class), would not exchange English Consols for French Rentes simply for the sake of gaining 1/2 per cent. interest per annum no matter how permanent he considered his investment in Consols to be previously.

Company Registration in England During 1895.

The records of Somerset House, in London, show that during the year 1895 a larger number of new companies were registered than in any previous year, though the total amount of nominal capital was not so large as in the years 1888, 1889 and 1890. The actual figures for 1895 were 3,540 companies with £197,866,065 nominal capital, as compared with 2,668 and £108,818,965 in 1894; 2,332 and £84,720,623 in 1893; 2,371 and £95,683,168 in 1892; 2,446 and £126,323,028 in 1891; 2,542 and £222,253,402 in 1890; 2,578 and £229,406,624 in 1889; 2,346 and £339,858,866 in 1888; 1,893 and £160,616,454 in 1887; 1,738 and £138,077,329 in 1886.

The most interesting section is of course mining, but it is difficult to know sometimes whether a company's prime object is mining or finance. Consequently the figure for the aggregate nominal capital cannot be given exactly, though the amount of £87,000,000 is correct for all practical purposes. This compares with £52,000,000 in 1894 and £35,000,000 in 1893, and shows that the proportion of capital of mining companies to aggregate capital has continued very nearly constant.

with £6,500,000, while shipping and cycling come with a little over £3,000,000 each.

Besides companies registered at Somerset House, there were 261 companies with an aggregate capital of £11,210,012 registered in Edinburgh, and 93 companies with an aggregate capital of £3,761,675 registered in Dublin. In both cases a considerable increase over 1894 was noticed. Of the capital, mining was represented in Edinburgh by £2,360,000, and in Dublin by £1,375,000. The total aggregate capital of the mining companies registered during 1895 in Great Britain and Ireland was therefore a trifle over £90,000,000.

The Bigelow Mining Companies' Reports.

We publish on another page abstracts of the reports of the Osceola and the Tamarack Mining Companies, both under Boston, so called, "Bigelow management." This term has come to mean that the concerns are managed in the dark, and the reports give no information that will enable stockholders to ascertain whether they are efficiently or even honestly managed or not. The recent collapse of the Butte & Boston Mining Company, of Montana, one of the Bigelow mines, and the compromising facts concerning it, which have been exposed by correspondents of the *Engineering and Mining Journal*, is an illustration of the natural outcome of this system of administration. At any time the stockholders in any of these mines may be prepared for further disagreeable exposures.

The stockholders may rest well assured that when the directors of a company decline to give such information to their stockholders as will enable them to ascertain the economy and honesty with which their property is being administered, it is always because there is something to conceal, which the directors are afraid or ashamed to have made public. In the early reports of the Tamarack Company full and satisfactory information was given. Why has this been changed?

This is what Mr. Joseph W. Clark, president, and Mr. A. S. Bigelow, treasurer of the Tamarack, said in their report for the fiscal year 1888:

"We have told all we have to say, that is, all we think the stockholders care to know. It is a bold innovation on the modern policy where stockholders have no rights which directors are bound to respect. This we consider a grand mistake, which will in due time be better understood and appreciated here in Boston, for we think the good old orthodox idea will some day come into vogue again, that directors are simply trustees of stockholders, and are in good faith bound to communicate all that is needful for them to know, so long as it does not conflict or interfere with pending negotiations."

Could anyone express a more complete condemnation of Mr. A. S. Bigelow in 1895 than did Mr. A. S. Bigelow himself in 1888. This official statement expresses our views, and we believe those of every honest trustee. Why has Mr. Bigelow changed them? What is it he now desires to conceal? Have the duties and responsibilities of trustees changed since 1888? In 1888 the directors of the Tamarack Company were: John N. Denison, Franklin Fairbanks, Joseph W. Clark, president; Nathaniel Thayer, John M. Forbes, George F. Bemis, John Daniell, A. S. Bigelow, treasurer. The directors of the company who sign the very unsatisfactory report of 1895 are: A. S. Bigelow, president; Thomas Nelson, Chas. Van Brunt, Leonard Lewisohn, Joseph S. Bigelow, Edward S. Grew, Wm. E. Parnall.

The prominent mines of the Bigelow management are as follows: Tamarack, Tamarack Junior, Osceola, Kearsage, Boston & Montana, Butte & Boston and Merced Gold. Of these the Butte & Boston has been completely wrecked, and the stock of each of the others has declined, as it should, for no one knows anything about them from their directors, and the public is justly afraid of "blind pool" or Butte & Boston methods.

We shall get together some data which will enable us to review this Tamarack report, but it is evident on its own showing that the company scarcely paid expenses last year and paid unearned dividends out of capital.

The British South Africa Company.

The delay in issuing the yearly reports of the British South Africa Company robs them of much of the interest with which they would be received if published promptly, but notwithstanding this drawback they are worth careful perusal, especially as estimates of the prospects of future developments are discussed at length, in addition to the history of the year covered by the report being placed on record. The report for the year, April 1st, 1894, to March 31st, 1895, has just been issued, together with a general sketch of the history of the year 1895 and a forecast of future work; but no mention is made of the Jameson business or events which led up to it, these matters being wisely left alone until after the official investigation. The accounts for the year in question show a very large advance both in income and expenditure, the former having increased from £44,489 in the previous year to £118,883, and the latter from £65,766 to £142,423. It will thus be seen that the income is not quite on a level with the outgoings, though under the circumstances the result cannot be considered as anything but satisfactory. During the year the capital was

increased from £2,000,000 to £2,500,000 by the issue of 500,000 new shares. These shares were sold at a premium of £2 10s. per share, or in other words the £1 shares were sold at £3 10s., and the large sum thus raised was employed in extinguishing the debenture debt and in subscribing £900,000 to a special railway fund.

It is unnecessary here to detail the work done in railways and telegraphs, but the estimates for future work in this direction is of interest. It is expected that the section of the Bechuanaland Railway from Mafeking to Gaborones will be open about July next, afterward the line will be continued another 175 miles to Palapye, with an ultimate extension to Salisbury, via Buluwayo, connecting with the Beira line at Umtali; as has already been stated in the *Engineering and Mining Journal*. The Beira Railway, which affords a much shorter route from the east coast, is being also proceeded with, and surveys have been made for the line from the present terminus, Chimoio, to Umtali and Salisbury. A new railway called the Beira Junction Railway will shortly be built from Fontesvilla, the present eastern extremity of the Beira Railway, connecting with Port Beira on the sea coast. As it is, a trans-shipment from vessels calling at Beira is necessary, and passengers and goods have to be taken up the river to Fontesvilla by special river steamboats.

The progress of mining in the company's territories has not proceeded to any extent as yet, but the country is being examined by some hundred exploration and development syndicates. The report gives a great mass of details obtained from these syndicates, and the majority state that they have discovered evidence of the existence of payable gold quartz, though the present inaccessibility of the country has prevented developments which would serve as tests for the correctness of their surmises. As independent judges who are not interested in the shares of any of the development syndicates, we are obliged to hold over our opinion until we have more reliable facts to go on.

An example of what is being done by these development syndicates is to be seen in the proceedings of the Selukwe Gold Mining Company. Mr. Jefferson Clark, a California man, was sent out at the recommendation of Mr. John Hays Hammond to inspect the properties and advise as to their development. He reported the existence of a lode of quartz 30 in. wide, bearing 1½ oz. of gold to the ton, which extended unbroken for 3,000 ft. along the outcrop, and by means of drifts and shafts he was enabled to prove the soundness of his views. At his recommendation money has been subscribed to provide a 60-stamp mill and accessories. Unfortunately, after Mr. Clark's arrival in London, some ten weeks ago, he was seized with a fatal illness contracted, it is to be feared, in the low-lying tracts of Mashonaland. This company is perhaps the most forward of any working in Charterland, but its condition promises well for itself and for the country generally.

BOOKS RECEIVED.

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

- Canadian Geological Survey: Summary Report for the Year 1895.* Ottawa; State Printers; pages, 154.
- Gold Mining; Briefly Described with Hints to Investors.* By Richard J. Middleton. London, Eng.; Gale & Polden. Pamphlet; pages, 39.
- The Cripple Creek Gold Fields, Colorado.* By C. C. Hoyer Millar. London, England; Eden Fisher & Co. Pages, 39. Price, in New York, 35c.
- Handbuch der Eisenhüttenkunde. Part III.* By Herman Wedding. Braunschweig, Germany. Vieweg & Sons. Pages, 899 to 1,218 inclusive.
- Buletin Statistic General al Romaniei, for the Year 1893-1894. Volume III., No. 3.* Bucharest, Roumania. National Printing Office. Pages, 339.
- Annual Report of the Minister of Mines of British Columbia for Year Ending December, 1895.* Victoria, B. C.; H. M. Printers. Pages, 84; with maps.
- United States Bureau of American Republics.* Annual Report of the Director, for the Year 1895. Washington, D. C. Government Printing Office. Pages, 28.
- Annual Report of the Comptroller of the United States Currency, Volumes I. and II., 1895.* Washington, D. C.; Government Printing office. Pages, 626 and 1273, respectively.
- Annual Report of the City Engineer of Minneapolis for the Year 1895.* By F. W. Cappelen, City Engineer. Minneapolis, Minn.; State Printers. Pages, 117; with maps and illustrations.
- Canadian Geological Survey. Report on the Area of the Kamloops Map-Sheet, British Columbia.* By George M. Dawson, Ottawa, Can.; H. M. Printers. Pages, 427; with maps and illustrations.
- Natural Philosophy of a Ventilating Regulator.* By H. W. Halbaum. Reprinted from *Science and Art of Mining*. Wigan, England; Wall & Son. Pages, 55; illustrated. Price, in New York, 20 cents.
- Coke; A Treatise on the Manufacture of Coke and the Saving of By-Products.* By John Fulton. Scranton, Pa.; published by The Colliery Engineer Company. Pages, 342; illustrated with plates and diagrams. Price, \$4.
- Thirty-fifth Annual Report of the Crown Land Department of the Province of New Brunswick, for the Year ending October 1895.* By L. J. Tweedie, Surveyor-General Chatham, N. B.; H. M. Printers; pages, 123.
- Directory of the Iron and Steel Works of the United States, Canada and Mexico; Corrected to January 1st, 1895.* Edited by James M. Swank. Philadelphia, Pa.; Published by the American Iron and Steel Association. Pages, 320.

Science and Art of Mining Handbooks for Mining Students and Colliery Managers, Part I. Geology; Surveying; Lighting of Mines; The Coal Mines Regulation Act. Wigan, England. Published by Science and Art of Mining. Pages, 48. Price, in New York, 20 cents.

Science and Art of Mining Handbooks for Mining Students and Colliery Managers; Part III. The Furnace and Other Methods of, and Problems in Ventilation; Ventilation by Machinery; The Anemometer, Barometer, Thermometer, Water Gauge. Wigan, England; published by Science and Art of Mining. Pamphlet; pages, 48. Price, in New York, 20 cents.

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

Magnetic Iron Ore as Flux.

Sir: I will ask you or some of your readers who are experienced smelter-men kindly to inform me about the value of high-grade oxidized magnetic iron ores as a fluxing in lead and copper blast furnaces, because some smelters here in the northwest only want hematite iron ores, whereas others buy magnetic-iron ores, considering these just as good. NELSON, B. C., Dec. 28th, 1895.

FLUX-MINER.

Trade with South America.

Sir: Since writing the letter which appeared in your issue of February 29th, regarding trade with South America, I have been informed by Messrs. Wm. R. Grace & Co., that their steamers of the "Merchants Line" are now making regular trips every 40 days to the various ports of the west coast of South America, and that a fifth vessel is being built, which will enable the company to make monthly departures from New York. This certainly should tend to bring about shipments to the West Coast Republics, direct from this country, instead of via England, or Germany, and, as the improved service becomes known among the merchants of the interior cities, will no doubt increase trade with the United States.

ROBERT PEELE.

New York, March 12, 1896.

Gold Mining in the South.

Sir: I am greatly surprised to note an abnormal activity in the so called gold mines in the South. I have just arrived in this city from South America and regret to learn that sensible people are co-operating with promoters in fostering a gold boom in the South. I believe that there are plenty of legitimate mining opportunities south of the Potomac, and I believe as well that the Southern gold boom is a fraudulent myth fostered by scheming promoters and destined to rob the people of their money. After having examined the Southern so called gold fields I desire to go on record as saying that if there were enough museums to warrant the mining of free gold samples for a show, the Southern gold mines might be worth a few thousand dollars. As it is they are worthless and will waste the money of all investors in them.

New York, March 12th.

C. F. Z. CARACRISTI, C. E.

Intelligent Finance.

Sir: The paragraph on "Intelligent Finance" in last week's issue calls for comment, inasmuch as it is claimed therein that the business methods of the U. S. Treasury are responsible for the fact that the bonds of the United States are not selling as high as those of England and France. One might as well accuse a traveling salesman with being less efficient than formerly because he cannot sell goods as well in the West now as he did when wheat was selling there at a dollar a bushel. Supposing that France, England and the United States were equally prosperous, that the bond issues of each country were just sufficient to supply the home demand, that only residents could hold bonds, and that the cost of living in the respective countries were as \$2.50, \$2.75 and \$4, then 2 1/2% Rentes, 2 1/2% Consols and U. S. 4's would, probably, sell at the same price in the respective countries. But as these bonds can also be held by non-residents, it stands to reason that in our present state of international intercourse a certain amount of equalization must take place in the market value of such securities. The extent of this equalization is limited by the preference which most people have for the bonds of their own government. Thus it is not likely that an Englishman who has bought Consols for permanent investment will exchange them for Rentes, merely for the sake of gaining 1/2% interest, or that a Frenchman will exchange his Rentes for U. S. 4's for a similar consideration, unless there are additional motives for prompting such action; and as the bona fide investors of the respective countries hold the bulk of their government bonds, no lasting equalization can be effected by merely speculative or "arbitrage" transactions.

Moreover, the English and French nations are money lenders, whereas the United States are borrowers.

Is it, then, not quite natural that United States bonds should sell lower in the markets of the world as long as the aforementioned conditions obtain?

There was a time when United States bonds sold nearly as high as the best securities abroad. That was during the inflation produced by the coining of silver dollars under the Sherman act. The result of that boom was, that foreign bona fide holders could not withstand the temptation to realize on Americans, and to put the proceeds into home securities; but the foreign speculators still held on to their bonds. Then came the Baring panic, and the foreign speculators had to let go. Result, that an enormous amount of capital was withdrawn from this country which would have remained here if our bonds had never sold as high as they did.

The only fault that can be found with the business methods of the United States Treasury is, that it has given its tacit consent to the introduction of the well-known European methods for over subscribing a new bond issue. Such methods are even reprehensible in a country that has surplus money to invest, because they create fictitious values that are apt to collapse at the slightest provocation. That, however, is not half as bad when said issues are held at home as when they come back from abroad.

HOBOKEN, March 24th, 1896.

A. D. E.

ABSTRACTS OF OFFICIAL REPORTS.

Oscoda Consolidated Mining Company.

The directors submit the following report of the operations for the past year and statement of the financial condition of the company:

From the sales of 6,270,373 lbs. of refined copper, silver sales, sale of building lots at Hancock, and interest receipts.....	\$679,907.33
The total costs have been.....	548,445.12
Total net income for year.....	\$121,462.21
Balance of assets December 31st, 1894.....	276,600.44
	\$398,062.65
Dividend No. 39 paid July 25th, 1895.....	\$50,000.00
Dividend No. 40 to be paid January 15th, 1896 ..	75,000.00
	125,000.00
Balance of assets December 31st, 1895.....	\$273,062.65

ASSETS.

Cash in bank and accounts receivable at Boston and copper on hand, since sold.....	\$310,244.13
Cash and accounts receivable at mine.....	19,704.19
Supplies on hand at mine.....	28,050.93
Fuel on hand at mine and stamp mill.....	41,785.56
*250 shares Hancock & Calumet Railroad stock..	25,000.00
Total assets.....	\$424,784.81

LIABILITIES.

Drafts and accounts payable.....	\$75,883.16
Dividends uncalled for.....	839.00
Dividend to be paid January 15th, 1896.....	75,000.00
Total liabilities.....	151,722.16
Balance of assets December 31st, 1895.....	\$273,062.65

* This stock paid 7 1/2% dividends in 1895.

The encouraging feature of the year's work to which we would draw your attention is the fact that in spite of the loss incurred by the fire and the expense of sinking the new shaft the total cost of copper per pound, which includes both these items exceeded the cost of the previous year by only 1 1/2%. The fire curtailed our total output by an amount fully equal to one month's product.

SUMMARY.

Product of mineral.....	7,399,846 lbs.
Product of refined copper.....	6,270,373 "
Yield of refined copper per cubic fathom of ground broken.....	437 "
Percentage of refined copper in stamp-rock.....	1.34%
Cost per ton of rock hoisted.....	\$1.77
Total cost per pound of refined copper for year.....	875c.

Tamarack Mining Company.

The directors of the Tamarack Mining Company report to stockholders the result of operations for the eighteen month sended December 31st, 1895, as follows:

Receipts from copper.....	\$2,143,201
Expenses at mine.....	\$1,324,641
Other expenses.....	341,785- 1,666,427
Mining profit.....	\$476,774
Balance of assets June 30th, 1894.....	\$654,252
Sale new stock.....	684,011
Due from new stock.....	265,928- 1,604,252
Balance.....	\$2,081,027
Dividends.....	\$600,000
Construction account.....	449,698- 1,049,698
Balance assets December 31st, 1895.....	\$1,031,328

ASSETS AND LIABILITIES.

Assets.		Liabilities.	
Accounts receivable at Boston and Hancock & Calumet Railroad Co. bonds ..	\$479,715.79	Unpaid dividends	\$10,270.00
* 250 shares Hancock & Calumet Railroad stock.....	25,000.00	Drafts outstanding.....	36,348.69
Cash and accounts receivable at mine.....	25,107.52	Accounts payable at mine.....	118,923.73
Supplies on hand at mine.....	131,179.88	Accounts payable at Boston.....	72,314.60
Wood and timber lands.....	177,932.84	Total liabilities.....	\$35,856.33
Cash in bank at Boston, and copper on hand, since sold.	428,248.75		
Total assets.....	\$1,267,184.88		

* This stock paid 7 1/2% dividends in 1895.

The directors' report says: "It will be seen from the financial report of the last eighteen months that the company did not fully earn the dividends which were paid during that period, and that the amount of \$123,000 was taken from the surplus and applied to dividends. We felt justified in doing this, believing that we should get an increased benefit from the work that has been done sufficient to enable us to continue our dividends and pay back to the surplus account what has been taken from it. Several causes combined to reduce the earnings. One was the breaking of the main shaft at No. 1 hoist in November, 1894, causing a loss of product and increase of expenses. Another was a bar of poor ground encountered in the midst of the territory tributary to No. 2 shaft, which was our main producing shaft. This was unexpectedly large and continued for several levels, and caused us to add largely to expenses to obtain our regular product. You will see from the superintendent's report that this ground has changed and that the last levels are very much better. This poor ground, coming at a time when one of our shafts was temporarily out of commission on account of breakdown of engine and before equipment of No. 3 shaft was complete, was the principal factor in our decreased earnings and emphasizes the fact that we should always have enough shafts in operation to be able to make up for any temporary deficiency in our supply from any one of them. As the sinking of one of these shafts to a depth of over 4,000 ft. requires at least five years, it will be seen that a long look into the future is necessary.

CHARLES A. STETEFELDT.

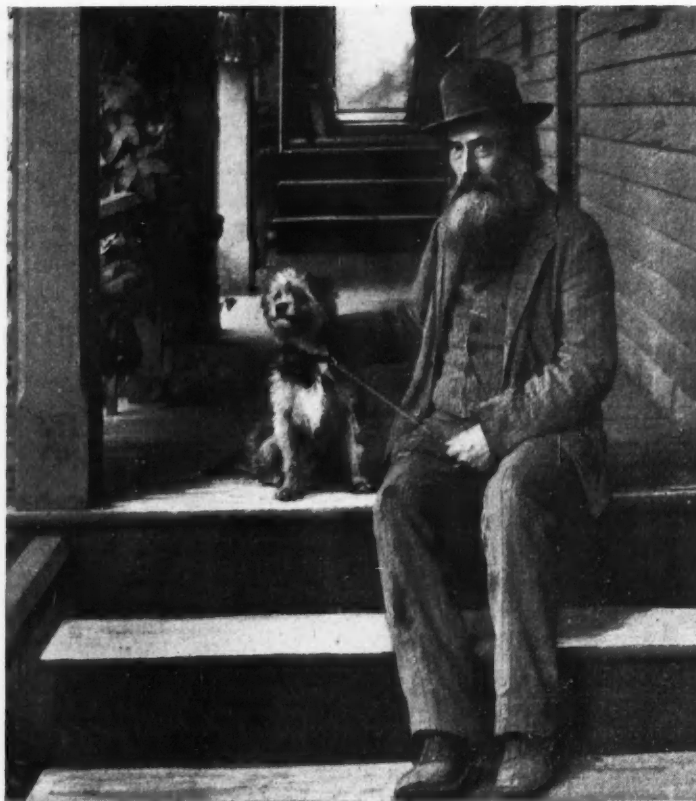
According to tidings just received, Charles A. Stetefeldt died at Oakland, Cal., on the morning of March 17. This event will cause, to many personal friends and professional colleagues, surprise as well as sorrow. Mr. Stetefeldt's age (57 years) and his continued professional activity justified the expectation of fruitful years to come; and my own recent correspondence with him had given me no warning to the contrary. But I now learn that for several months past the action of his heart had been slow and feeble, and he had been subject to occasional attacks of vertigo. For want of a more precise explanation, he is said to have died of heart failure. Further particulars are not yet in my possession, nor would they be specially important, in view of the supreme fact of his departure.

Having myself reached that period of life when I seem to be (and probably am) bidding farewell to more old friends than welcome to new ones, this fresh loss serves to confirm in me the feeling that my chief occupation henceforward must be to celebrate the virtues and labors of those contemporaries whom it may be my fate to survive, until that day when somebody shall render to me the same service.

I wish I were better prepared to characterize justly, upon such sudden notice, the work of my departed friend. His death revives memories and

In 1865 he established, with John H. Boalt (then a mining engineer pure and simple, but now, as the result of a change of profession, one of the leaders of the San Francisco bar) a branch of our business at Austin, Nev., in the then "booming" Reese River district. I believe he built the first blast furnace at Eureka, Nev., thus inaugurating an industry which afterward produced many millions. So far as Stetefeldt himself was concerned, I fancy that this episode of his life was chiefly valuable as furnishing to him that contact with actual practice in a new country which is necessary to correct the theoretical and scholastic notions derived from a foreign education.

Soon after coming to America, he had taken out a patent for a special arrangement of the Gerstenhofer shelf-furnace for desulphurizing pyritic ores. This patent, which, considered by itself, was doubtless an infringement, or, at best, a mere subordinate improvement, upon that of Gerstenhofer, was, by agreement with the latter, offered to the American public; but, after a single unsatisfactory trial in Colorado, the invention was practically abandoned. According to my recollection the immediate cause of failure in this first experiment lay in the construction and management of the apparatus itself; but back of that was the more serious question, whether the simple desulphurization of auriferous pyrites would leave the material in a suitable condition for effective subsequent extraction of gold by amalgamation. The discouraging answer given by experi-



CHARLES A. STETEFELDT.

associations of a period long past, which, though primarily of personal interest, are not without significance in the history of American metallurgy.

The time to which I refer was more than thirty years ago, at the close of the civil war, when I was associated with Dr. Justus Adelberg (long since deceased) for a consulting practice in mining and metallurgy. The time was peculiarly favorable for such an undertaking. There was a great revival of mining industry and speculation, coupled with a great scarcity of trained experts; and the firm of Adelberg & Raymond was so overwhelmed with work as to require the assistance of many young men, mostly graduates of German schools. It is with much satisfaction that I recall the names of many who were thus introduced into the American practice, and whose subsequent professional careers have been characterized by success to which this early experience must have contributed in some degree. Among them were Hermann Credner (afterward Professor at the University of Leipzig, and Director of the Saxon Geological Survey) and Eilers and Hahn (recognized authorities in the modern practice of lead smelting), not to mention others, of, perhaps, less conspicuous distinction. But of all that company of young men the most thoroughly and widely accomplished, at that time, was Stetefeldt.

He was born September 28th, 1838, at Holzhausen, a village in Thuringia, Germany. He was educated at home by his father, a Lutheran minister, until, at the age of 14, he was sent to the Gymnasium at Gotha. While there he was one of the founders of the "Naturwissenschaftliche Verein der Gymnasiasten zu Gotha," a society which still exists and flourishes.

In 1858 he entered the university at Goettingen, where he remained for two years, studying principally under Woehler, Wilhelm Weber, Sartorius von Waltershausen and Stern. He then went to the School of Mines at Clausthal, and passed there, in 1862, the "Ingenieur-Examen," receiving the first degree in all branches. The following year he spent in the principal metallurgical works in Germany, especially at Freiberg, and emigrated in 1863 to the United States.

A few days after his arrival in New York he was engaged as assistant by Charles Jay, Professor of Chemistry at Columbia College. It was in the following year that he became an assistant of mine.

I soon found that he possessed a knowledge of mathematics and chemistry much beyond the usual equipment of a mining engineer or metallurgist, and, at the same time, an exceptionally wide scientific and literary as well as technical culture.

ment to this question killed the prospects of a good many "desulphurizers" in Colorado a quarter of a century ago.

But out of this adverse experience the skill and genius of Stetefeldt extracted a conception of real and permanent value. Having satisfied himself that, especially in an atmosphere containing chlorine, as well as oxygen, the reactions of oxidation and chlorination were so rapid as to be (for particles sufficiently small, and sufficiently exposed to this atmosphere) practically instantaneous, he boldly discarded the shelves of the Gerstenhofer furnace, substituting the free fall of the charge in an open shaft. This invention, known throughout the world as the Stetefeldt furnace, was undoubtedly both a novelty and an improvement, though the precise limits of its advantageous use are still matter of controversy. Whatever may be the ultimate result of the discussion—a subject upon which I shall offer no opinion here—the name of Stetefeldt, in connection with this furnace, will remain indelibly imprinted upon the history of metallurgy.

After the successful introduction of this furnace, Mr. Stetefeldt went to Europe in 1870, and did not return until 1872, when he made his headquarters at San Francisco. In 1882 he returned to New York, but took up his residence again in California in 1889.

The latter years of Mr. Stetefeldt's life were largely devoted to perfecting the construction and operation of his furnace, and of operations in metallurgical practice to which it was auxiliary. The most important of these was the Russell process of lixiviation, concerning which he published several papers and a text-book, the second edition of which appeared last year.

One of his latest enterprises in connection with the improvement of silver mills was the introduction of producer gas for firing dry kilns and roasting furnace at the Marsac Mill, Park City, Utah, a new departure, which promises to be of great importance, and will, no doubt, be generally adopted where wood can be profitably replaced by coal.

Mr. Stetefeldt entertained an inveterate dislike to sitting for his portrait. The picture given herewith is from a photograph, taken almost without his consent, and showing him in company with the inseparable companion of the last few years of his life, a crippled dog, with three legs and one eye, called "Zulu." It is reported that this affectionate creature has refused food since his master's death, and will not long survive him.

R. W. RAYMOND.

FIRST ANNUAL REPORT OF THE MINERAL INDUSTRY IN GREAT BRITAIN.

(Concluded.)

Part III. Accidents.—Mr. Foster has made a special study of this subject, and the manner in which he has analyzed and divided the accidents from different causes and those which happened below ground and the others on the surface is very instructive.

The causes of accidents are carefully and fully gone into, covering explosions of fire damp or coal dust, and quoting one notable example, viz., the Albion colliery explosion which was finally determined to be due to the ignition of coal dust or a small accumulation of fire damp from a shot fired in the timber supports of a main roadway which was being straightened out.

The next subject under this heading taken up is falls of ground, ably dealt with and instructive, more especially in connection with the tables relating to that class of accident, to any one interested in coal mining.

Part IV. Prosecutions.—This section may not have special interest for our readers, but it is as well to note that out of 135 separate prosecutions on serious counts 105 resulted in conviction.

Part V. General Matters.—This deals with the question that we have recently gone into fully in the Journal, viz., explosion from coal dust in mines, our information on the subject being derived from the report of the Flameless Explosives Committee of the North of England Institute of Mining and Mechanical Engineers.

Comparison of the Mineral Industries of the United Kingdom and Other Countries.

Mr. Foster starts by stating that one of the recommendations of the Royal Commission was that the British mining industry should be compared with similar industries of other countries; this proposal cannot be carried into effect without compiling the mineral statistics of the world, a task which I have undertaken with no light heart.

concerning the mineral industry of each country, giving references to the original sources, which will enable the reader to pursue his inquiries further if required. In time I hope that the Mineral Statistics Branch of the Home Office will have a very complete library of the official reports of other countries.

The arrangement is in alphabetical order as regards countries and colonies, so as to give the information in this shape in place of by continents. The obstacles which confront the compiler who attempts even a rough sketch, are manifold. They may be summed up briefly thus:

- 1. Absence, incompleteness, or indistinctness of official data.
2. Differences in the methods of drawing up the statistics.
Many countries publish no mineral statistics; others supply certain figures, such as the output, but omit to state the number of persons employed, or the number of mining accidents.

PERSONS EMPLOYED AND NUMBER OF ACCIDENTS (a) IN AND ABOUT THE MINES OF THE UNITED KINGDOM.

Table with columns: Year, Persons Employed in and About All Mines (Below-ground, Above-ground, Total), Number of Deaths from Accidents (From Different Causes Underground, Total Surface, Gross Total), Death-Rate per 1,000 Persons (Employed Underground, Total Above-ground, Total Above and Under-ground).

(a) From 1851 to 1890, coal mines only; from 1861 to 1872, coal and stratified ironstone mines only; from 1873 to 1894, all mines, whether producing coal, metallic ores, stone, or other minerals. (b) Explosions of fire damp or coal dust.

proper comparison with our country. The terms "mine" and "quarry," or their equivalents in other languages, have not the same meanings in all countries. Workings which would be legally mines in England are not necessarily mines in France, and vice versa.

The Arab is not a miner by nature, and there is little or no working for

minerals on the great Arabian peninsula. In days gone by, according to Burton, gold mines were worked in the land of Midian.

The statistics are, however, interesting in that in such countries as furnish full returns, the number of persons employed in the industry are recorded. In some cases the details are very full. In Austria the people employed are subdivided into men, women, young persons and children. The accident statistics are instructive, and as complete as can be expected in the first issue of such a work. In Prussia, where such figures are obtainable, the number of persons employed is stated, total number of deaths percentage; in brown coal mines, in coal mines in other mineral workings, and in ore mines.

The final report of the Royal Commission on Explosions from Coal Dust in Mines is well summarized as follows:

"I. The circumstances of many explosions, and especially of explosions on a very large scale, and covering a great length of the workings, cannot be fully explained by reference to fire-damp or gas alone.

"II. The presence of coal-dust, and especially of fine dust, may be the sole cause of an explosion.

"III. If the coal-dust is in sufficient quantities it will certainly extend the effect and increase the intensity of an explosion caused by any other means.

"IV. Fire-damp in small quantities, so small as not to be dangerous *per se*, may be highly dangerous in the presence of coal-dust."

GREAT BRITAIN AND IRELAND, TOGETHER WITH THE ISLE OF MAN.*

QUANTITY AND VALUE OF MINERALS PRODUCED FROM MINES AND ALL OTHER DESCRIPTIONS OF WORKINGS.

Description of Mineral.	Quantity.	1893.		1894.	
		Value at the Mines and Open-works.	Value at the Mines and Open-works.	Quantity.	Value at the Mines and Open-works.
Alum clay (bauxite).....	Metric tons.	8,880	£4,150	8,098	£5,618
Alum shale.....	"	2,142	264	4,036	496
Antimony ore.....	"	.....	.....	.....	.....
Arsenic.....	"	6,072	57,694	4,878	48,614
Arsenical pyrites.....	"	3,085	2,948	3,341	3,823
Barytes.....	"	22,702	25,363	20,987	21,410
Bog ore.....	"	10,920	2,686	7,928	1,951
Clays (excepting ordinary clay).....	"	3,114,397	817,419	3,316,143	823,701
Coal.....	"	166,962,820	55,809,808	191,298,916	62,730,179
Copper ore.....	"	5,432	12,961	5,845	13,909
Copper precipitate.....	"	234	2,210	245	2,313
Fluor spar.....	"	4,561	161	126	63
Gold ore.....	"	145,789	59,369	155,913	66,355
Gypsum.....	"	11,383,264	2,827,947	12,565,773	3,190,617
Iron ore.....	"	16,091	7,292	15,772	8,042
Iron pyrites.....	"	408	177	217	48
Lead ore.....	Metric tons	41,463	280,539	41,251	266,995
Lignite.....	"	3,316	816	339	83
Manganese ore.....	"	1,357	762	1,838	740
Ocher, umber, etc.....	"	10,703	13,880	8,653	14,040
Oil shale.....	"	1,987,917	489,130	2,018,262	496,691
Petroleum.....	"	264	488	50	92
Phosphate of lime.....	"	3,353	5,771	711	1,277
Salt.....	"	1,934,905	735,222	2,271,793	763,629
Slates and slabs.....	"	446,038	1,107,626	469,082	1,171,366
Soapstone.....	"	.....	.....	10	45
Stone, etc.....	"	.....	7,773,743	.....	7,695,716
Strontium sulphate.....	"	5,905	2,325	6,932	1,962
Tin ore.....	"	13,909	637,653	13,117	487,523
Uranium ore.....	"	25	500	19	815
Wolfram.....	"	22	420	.....	.....
Zinc ore.....	"	24,135	81,270	24,171	67,311
Total values.....	.....	.....	£70,767,651	.....	£76,898,938

Summary of the metals obtainable commercially from the ores in the above table:

Description of Metal.	1893.		1894.		
	Quantity.	Value at the average Market Price.	Quantity.	Value at the Average Market Price.	
Copper.....	Metric Tons.	433	£20,522	451	£19,482
Gold.....	Kilos.	72	8,691	132	14,811
Iron.....	Metric Tons.	4,042,542	9,333,797	4,417,238	9,999,186
Lead.....	"	30,175	292,402	30,163	284,624
Silver.....	Kilos.	8,525	43,997	8,575	33,313
Tin.....	Metric Tons.	8,980	785,714	8,461	604,500
Zinc.....	"	9,433	167,770	8,260	131,029
Total values.....	.....	.....	£10,619,610	.....	£11,086,945

* Mineral Statistics of the United Kingdom for 1894.

After discussing these various points *seriatim*, and giving details concerning several of the great explosions which have taken place of late years, the Commissioners sum up their conclusions as follows:

"1. The danger of explosion in a mine in which gas exists, even in very small quantities, is greatly increased by the presence of coal-dust.

"2. A gas explosion in a fiery mine may be intensified and carried on indefinitely by coal-dust raised by the explosion itself.

"3. Coal-dust alone, without the presence of any gas at all, may cause a dangerous explosion if ignited by a blown-out shot, or other violent inflammation. To produce such a result, however, the conditions must be exceptional, and are only likely to be produced on rare occasions.

"4. Different dusts are inflammable, and consequently dangerous in varying degrees, but it cannot be said, with absolute certainty, that any dust is entirely free from risk.

"5. There appears to be no probability that a dangerous explosion of coal-dust alone could ever be produced in a mine by a naked light or ordinary flame."

The precautions suggested by the witnesses are next examined, viz.:

1. Abolition of the use of gunpowder.
2. Use of flameless explosives.
3. Use of water cartridge.
4. Use of lime cartridge.

The Commissioners come to the following conclusions:

1. That the use of high explosives "would greatly limit the risk of explosion in dry and dusty and in fiery mines."

2. They do not feel justified in recommending the universal abolition of the use of gunpowder, but they recommend that the Secretary of State should be empowered by further legislation "to prohibit the use of gunpowder in the case of every mine, which is either fiery or dry and dusty, unless sufficient and effective means of watering are carried out."

As a means of settling what are "fiery" or "dry and dusty mines," the Secretary of State would have to prepare a list of such mines, and would then have to give the owners notice that their mines were so included, allowing them 12 months to carry out the requisition.

Any owner objecting to the notice would have power to appeal to a temporary commission specially appointed for the purpose of deciding the question.

3. Another recommendation is that explosives for use in mines should be examined and certified by the Home Office as fit for the purpose.

4. "All tamping should be done with clay or other non-inflammable substances."

5. They consider that the only effectual way of remedying the danger arising from coal-dust is by a complete and satisfactory system of watering.

6. They propose that the inspectors should give notice under section 42 of the Coal Mines Regulation Act, 1887, when they consider the provision for watering insufficient.

7. They finally recommend that the owners and managers of mines should pay special attention to the following precautions already partly provided for in the existing statute:

"1st. That the firing of shots should be carried out between the shifts and when the majority of the men are out of the mine.

"2d. Where general watering is not prescribed by the inspector, that the roads on either side of the place where a shot is fired should be thoroughly wetted for a space of at least 30 yards; and

"Lastly, that large accumulations of dust, whether on the roof or floor, should not be allowed to remain."

INSPECTION OF MINES IN BELGIUM.

In no country is the inspection of underground workings more stringent and complete than in Belgium, subject as it is there to the following rules: (1) All the workings of every mine must be inspected, at least once every six months, by the ingenieur-des-mines of the district. (2) Each inspection forms the subject of a minute report chiefly dealing with the safety of working. (3) This report is examined and scrutinized by the ingenieur-en-chef des mines, director of the arrondissement, and by his chief assistant. (4) The report is then sent to the district director, who examines it. (5) This high official addresses periodically to the minister a report, founded on the above as to the progress and condition of mine working in the kingdom generally, in which special attention is paid to the conditions of safety and hygiene. It follows that these successive examinations of the inspector's reports give rise to exchange of views, observations and explanations, which often lead to fresh inspections, inquiries, etc. The workings of each mine are, therefore, constantly followed by five members of the Mine Administration, of whom four, at any rate, have grown old in the service; and each one of them makes the observations he thinks necessary, which sometimes lead to a special examination by the other members, either jointly or severally. In no case, observes the *Organe Industriel*, which gives the above particulars, does the supervision of mine workings fall into the hands of a young, inexperienced official alone; and one of the articles organizing the Corps des mines obliges the chief engineer of the arrondissement to prepare for such supervision the inspectors admitted into the mine administration; and these young engineers, who have at their disposal the reports of their predecessors, act under the advice of their immediate chiefs.

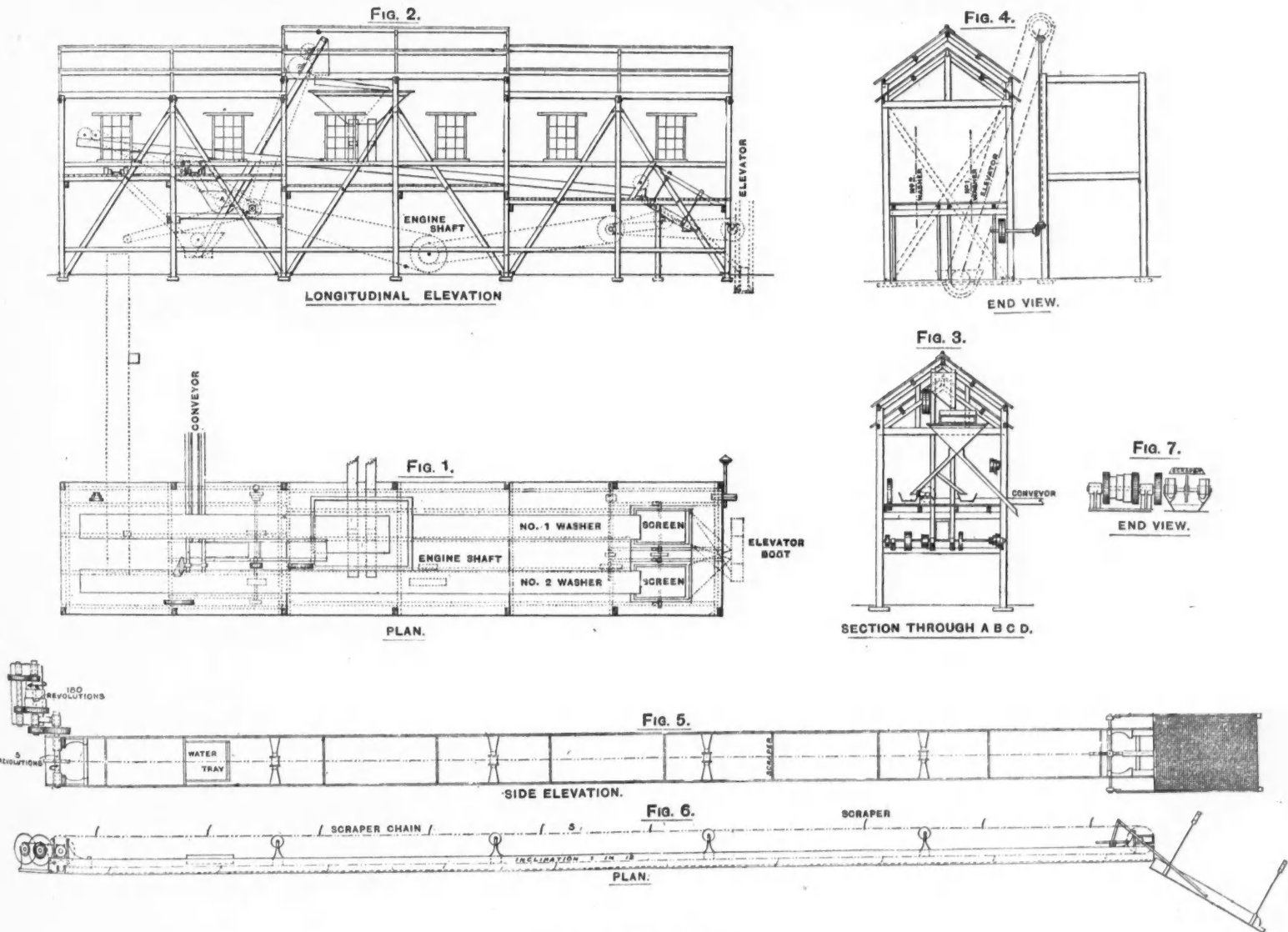
Arrangements for damping coal dust in the Hibernia Colliery, Westphalia, are now extended to all the seams; and for collecting the water supply there is a lodge at the level of 340 m. (186 fathoms) with a capacity of 552 cu. m., or three times the quantity necessary for a day's use. When the mine water becomes insufficient the reservoir is filled by two pumping engines, erected at the level of 610 m. (333 fathoms), that work alternately, the water in either case being filtered through a layer 2 m. (6 ft. 6 in.) thick of broken slag, held in place by planks bored with holes. The outlet branch pipes in the crosscuts have a diameter of 52 m. (2 in.); and the pipes leading from the latter to the working places, half that diameter, while the whole length of piping is about 45,820 m. (50,110 yards). The pipes, which are in lengths of 5 m. (16 ft.), are of wrought iron, galvanized to protect them from rust, and jointed with loose flanges and india rubber washers. In order to permit of thoroughly damping all the workings, every 50 m. (54 yds.) three-flange unions are introduced, each of which is fitted with a hydrant carrying shut-off cock and union joint. In front of the working faces there are also hydrants with shut-off cocks and union joints, the total number of hydrants being 1,016. In addition to the shut-off cocks on the hydrants there are 140 others, by means of which the branch pipes may be shut off for repairs or lengthening the service pipes. The damping is effected by india-rubber hose screwed on to the hydrants, and their nozzles consist of short pieces of gas pipe with a 3 mm. orifice. The sprinkling of the coal dust is effected, in front of the working places, by men appointed for the purpose of whom there are at present 13; and the faces of stone drifts are also regularly provided with sprinkling apparatus. In some places for ventilating separate workings, as well as preventing collections of firedamp where cavities have formed in the roof, 10 fixed roses and also Pelzer fans are provided. Up to the present time, states the *Zeitschrift für Berg- und Hüttenwesen*, no injurious influence of any consequence has been noticed in the workings of this colliery; and the total expenses of the damping arrangements, including erection, extension and maintenance of the plant, and also the work in connection with it, has not quite amounted to \$44,700 for the five years ending with June last.

THE ELLIOTT COAL WASHER.

JAPAN AS A MANUFACTURING COMPETITOR.

The Elliott coal washer is designed on the principle of the trough washer, except that traveling scrapers are substituted for the fixed stops. The general arrangement will be understood from the accompanying illustrations, which represent the plant now in operation at the Wirral colliery, Cheshire, England. The trough is fixed at an inclination of about 1 in 12, and in cross-section it is wider at the top than at the bottom. The scrapers are made to fit the cross-section and they are attached at intervals to an endless chain which travels slowly up the trough. The coal is fed from a hopper to the trough at a point about midway from the two ends, and the water is pumped in at a point near the top. The coal is carried down by the water while the dirt is caught by the scrapers and gradually brought up to the top of the trough and discharged. In the illustrations, Figs. 1, 2, 3 and 4 show plan elevations and section of the plant, and Figs. 5, 6 and 7 show plan and side and end elevations of the scrapers and scraper chain. The illustrations show two washers, but as yet only one is erected. The one washer is designed to treat 10 tons an hour, but as a matter of fact it is treating 11 tons per hour. The trough is 60 ft. long and in cross-section is 1½ ft. wide at the bottom and 2½ ft. wide at the top. The scrapers are fixed at intervals of 6 ft. on the endless chain; they are 4 in. deep and fit the trough exactly. The shape of the trough enables the scrapers to maintain the fit as wear takes place. The speed of the scrapers and the feed of water and coal can all be

At a time when a great deal of attention is being given to the industrial future of England, in reference to the competition of other countries, it is not without importance, although it may be looked upon as a little too previous, to give a glance at the possibilities of witnessing, before another decade has passed over our heads, such a remarkable advance in the industrial status of Japan, as may result in making that country a more formidable industrial rival than either Germany or the United States. The *Iron and Coal Trades Review* calls attention to the probability of Japan being shortly in a position to dispense with British supplies through enterprises now pending in that country, and it is but a short step from complete independence of foreign sources of supply to the stage of competing with foreigners in outside markets. Two important projects are said to be now in course of development in Japan, and both of them are designed to enable the Japanese to produce a great part, if not practically the whole, of their iron and steel. The first is the reported arrangements made for the establishment of a steel foundry there by Sir W. G. Armstrong & Co., Limited, already reported in the *Engineering and Mining Journal*. The second is a project designed to enable the Japanese to produce their own railway material by the construction of a large Bessemer steel plant, capable of providing them with 40,000 tons to 60,000 tons of steel rails per annum, which is understood to be definitively adopted. The iron industry has already obtained a footing in Japan, but not as



THE ELLIOTT COAL WASHER.

varied to suit the quality and sizes of the coal. At the Wirral colliery the coal treated consists of the whole of the slack that will go through a 1½-in. mesh, the dust, pea and nut not having been separated. The analysis of the coal before washing shows 24% of ash, while after treatment the ash contents are 4.2%, of which about 1.2% is free dirt and 3% inseparable ash residue. The quantity of water used is 150 gallons per minute. After leaving the trough the water and clean coal pass over a gauze screen, which separates the water from the coal. The water is then pumped back to be used over and over again. There is, of course, a slight continual loss of water, so the additional supply which has to be added is introduced on to the coal in a fine spray as it is passing over the gauze screen in order to give it the necessary clean appearance before going to the storage box.

At the Wirral plant, everything is done automatically, and, after the correct adjustment has been made, absolutely no attention is required. It is obvious that there are so many means of adjustment that any class of washing can be effected by this system. The plant is made by the Hardy Patent Pick Company, of Sheffield, England.

yet to any considerable extent. The total quantity of pig-iron made in the country does not exceed 20,000 tons a year, while of steel the output is officially given as less than 2,000 tons, and of manufactured iron about 5,000 tons. Of coal, however, there is an annual output to the extent of 2,600,000 to 2,800,000 tons a year. Up to the present time there has only been one steel works in Japan, known as the Sekai Works, in Izumi Province, which was established by Moriyama Moriyuke, ex-director of the Osaki Mint, in 1889. These works were started with the idea of providing sufficient steel for the military and naval services of the country, but that result was not accomplished, and hence the present movement to extend the manufacture by building works at Osaka for the Japanese Steel Manufacturing Company. It may be added that in 1878 there were 53 iron mines and 186 coal mines in the country.

The first blast-furnaces of a modern type built in Japan were constructed in 1875 at the iron mines of Heigori. They were built to smelt the magnetic-iron ores of that locality, which contain 60% of iron. The contract for the iron and brickwork fittings was placed with Messrs. Head, Wrightson & Co., of the Teesdale Iron Works, Stockton-on-Tees.

Whitwell's stoves, Lurmann's closed hearth, and other improvements were adopted. The blowing engines, of the vertical type, were supplied by Messrs. Galloway, of Manchester. The furnaces are 57 ft. high, 4½ ft. diameter of hearth, 10 ft. bosh, and 6 ft. at the mouth. They were constructed of Japanese firebrick, and were intended to turn out between 75 and 80 tons of charcoal-pig per week.

The principal iron-manufacturing plant in Japan was constructed from the designs of the late Mr. David Forbes, foreign secretary to the Iron and Steel Institute, as far back as 1875. The works, as originally constructed, included 12 puddling and 7 re-heating furnaces, with forge train, plate, rail, and bar and guide mills, steam hammers, shears, etc. The establishment was got into working order about a year later. The machinery was furnished by Messrs. Tannett, Walker & Co., of Leeds. Since the China-Japanese war several projects have been put forward, looking to enabling the Japanese to manufacture their own iron and steel—some by Americans, others by Germans, and others, again, by English engineers and capitalists, but the shrewd people of that country have apparently, like the Chinese, made up their minds that they should themselves be sufficient for these things, and they do not wish more foreign aid than is absolutely necessary. In view of the importance of this subject, we propose to publish in early issues of the *Review* a series of articles illustrative of the resources of Japan, and pointing out how far Japan may be expected to compete with Great Britain as an iron manufacturing nation. We need only here add that the danger of such competition is, in our opinion, by no means so remote as is generally supposed.

THE PHYSICAL QUALITIES OF ACID OPEN-HEARTH NICKEL STEEL.*

By H. H. Campbell.

The strength of a bridge of given weight and design, the weight of a bridge of a given strength and design, and the longest span possible under a given design, are all limited by the elastic strength of the material used. These well-understood axioms point naturally to the use of steel possessing a high elastic limit, but this tendency is opposed by the no less well-known fact that, as the elastic strength of steel is increased by ordinary strengthening influences, there is a reduction either in the static or the shock ductility. It is true that an increase in brittleness under shock is not always shown by the ordinary system of tests, but broad generalizations from general experience have led engineers to avoid metal of high strength. Within recent years certain experiments by the United States Government upon armor plates have proved quite conclusively that an alloy of nickel with steel will give a metal possessing a high ultimate and elastic strength with an exceptional toughness. Moreover, these experiments seem to show that the metal is pre-eminently fitted to withstand the effects of sudden shock.

The manufacture of nickel steel is attended by a considerable increased cost, arising from the cost of nickel itself, which, although quoted at the lowest price that has ever been known, is now sold at 35c. per pound. Inasmuch as the steel should contain about 3% of this element, it is easy to see that the cost, under the present conditions of nickel production, must prohibit the use of the new alloy for ordinary purposes. It has probably occurred to many engineers, however, that under certain circumstances, as in the construction of long-span bridges, the extra cost per pound might be much more than counterbalanced by the diminution in the weight, particularly of the tension members.

Before venturing to use such a new material the conservative engineer would ask for some definite information on its physical qualities when rolled into plates, angles and rods, under the conditions of every-day practice. To furnish this information, the Pennsylvania Steel Company has made a heat of nickel steel, and has rolled it into common structural shapes, the results being herewith presented. It has also made similar shapes of low phosphorus acid open-hearth steel without nickel. These two kinds of steel were rolled in the same mills, and were tested in the same machines and by the same operator, so that the results are fairly comparable. In order that such an investigation should be conclusive, it would be necessary to make a large number of heats and several tests from each heat, but that is almost out of the question in the case of nickel steel, on account of the expense involved and the fact that there is no present market for the product. On this account only four tons of metal were made.

Two ingots were cast of the nickel steel, one of which had a cross-section of 18 × 20 in. and the other 16 × 20 in. The larger ingot was rolled into four slabs with a cross-section of 16 × 5 in., and two of these were rolled in the universal mill of the Central Iron Works, Harrisburg, Pa., and two were rolled in the plate mill of the Paxton Rolling Mills, Harrisburg, Pa. Both mills made one ½-in. plate and one ¼-in. plate. The amount of reduction on these slabs from the ingot was not so great as might be desired, and it would have been better if a larger ingot and a thicker slab had been used; but as the whole charge weighed only four tons, a larger ingot was out of the question. The smaller ingot was rolled partly into blooms and partly into billets. The blooms were rolled by the Pennsylvania Steel Company into angles of different sizes, while the billets were rolled into rivet rods at the same works.

The rods, angles and plates of the high steel containing no nickel, which is called "hard forging steel" in the tables, were rolled from such blooms and slabs as happened to be on hand at the time, and hence were from different charges. They were made from ingots varying in cross-section from 16 × 20 in. to 24 × 32 in.

The results of the test of nickel steel places the records of the three grades in more convenient form for comparison. The elastic limit was found by the drop of the beam. This was readily determined in the case of the nickel steel and of the softer "forging steel," but was not well marked in the plates of the "hard forging steel." The results are rather disappointing in showing a less superiority of the nickel steel than may be commonly supposed. Special methods of heat treatment might be made to show better results, but if this plan is followed in the case of one grade of steel it should be followed in all others. Judging from the records given, it

seems doubtful if nickel steel offers such marked improvement in quality that it can be employed profitably in ordinary engineering work.

SUMMARY OF THE AVERAGES GIVEN.

Shape of member.	Kind of steel.	Ultimate strength: Pounds per square inch.	Elastic limit: Pounds per square inch.	Elastic ratio: Percentage.	Elongation in 8 in. Percentage.	Elongation in 2 in. Percentage.	Reduction of area: Percentage.
Rounds.....	Nickel.....	86,015	63,575	73.9	20.19	31.00	46.3
	Hard forging.....	87,063	58,055	66.2	16.70	24.44	50.3
Angles.....	Nickel.....	78,065	51,793	66.3	23.94	39.67	52.0
	Hard forging.....	86,960	58,553	67.3	21.75	34.83	43.3
Universal plates, longitudinal.....	Nickel.....	87,820	54,153	61.7	19.25	34.83	43.3
	Hard forging.....	76,970	49,544	64.4	21.07	39.25	52.0
Universal plates, transverse.....	Nickel.....	85,773	58,410	68.1	20.50	37.67	47.0
	Hard forging.....	82,773	50,163	60.6	26.78	32.17	27.4
Sheared plates, longitudinal.....	Nickel.....	78,996	46,654	59.1	16.50	28.92	36.1
	Hard forging.....	85,173	(50,000)*	(58.7)*	18.83	23.17	27.4
Sheared plates, transverse.....	Nickel.....	85,337	58,169	68.1	19.00	35.50	48.3
	Hard forging.....	85,012	(50,000)*	(58.8)*	22.10	39.40	48.4
Sheared plates, transverse.....	Nickel.....	78,918	49,128	62.3	22.03	32.50	50.8
	Hard forging.....	84,377	57,260	67.9	17.13	32.50	43.4
Sheared plates, transverse.....	Nickel.....	84,327	(50,000)*	(59.3)*	21.71	37.00	41.3
	Hard forging.....	.....	.....	.....	.....	.....	.....

* Approximate. Could not determine accurately.

The hard forging steel contained 0.30 to 0.35 carbon; 0.60 to 1.00 of manganese; 0.03 to 0.05 sulphur, and 0.03 to 0.05 phosphorus. The forging steel carried 0.25 to 0.30 carbon, 0.6 to 0.8 manganese, 0.03 to 0.07 sulphur, 0.03 to 0.06 phosphorus, and 0.03 to 0.04 copper.

ELECTRIC POWER FOR MINING.

When the Westinghouse Electric and Manufacturing Company installed an alternating current electrical power transmission plant at Telluride, Colo., in 1891, the electrical world was very much interested in the operation, because it was the first plant of its kind that had ever been installed in this country. The apparatus had been ordered by the San Miguel Consolidated Gold Mining Company, a corporation owning gold mining territory in South Western Colorado mountains. Hitherto it had been commercially impracticable to operate these mines, because the excessive cost of fuel and power at an altitude of 13,000 ft. above the sea level made it prohibitive. It was then that electric power was suggested, which promised to overcome the difficulty, especially since the company owned a waterfall in the San Miguel Valley, which contained sufficient amount of water power to operate all their mines, if it could be made available.

It was then suggested to Mr. Nunn, the general manager of the company, to investigate the Tesla Polyphase system of electrical power transmission. This was done with the result that a contract was entered into with the Westinghouse Electric and Manufacturing Company to install a 100 H. P. A. C. generator and a 100 H. P. motor with the necessary switchboard appliances. The generator was connected with a Pelton water wheel and the current was carried for three miles up the mountains to the Gold King mine. The success of this undertaking was established from the first. The owners of the San Miguel Company are satisfied of this fact and they have recently contracted for an extensive increase in the electrical plant. The additional machines were ordered from the Westinghouse Company some time ago and they are now being installed.

These machines are two 800 H. P. 500-volt quarter-phase generators, running at 7,200 alternations. These generators will be directly connected to two Pelton water-wheels, and two 30 H. P. multipolar generators will be operated as exciters. While these appliances will be installed in the central power house, the company will have a number of sub-stations at the different mines throughout its property. Among these stations will be distributed 12 50-H. P. polyphase Tesla motors; 15 20-H. P. polyphase Tesla motors; 12 100-kw., 100-11600 volts, two-phase three-phase step-up transformers; 10 50-kw., 10000-220 volts; 10 25-kw., 10000-220 volts, and 16 10-kw., 1000-220 volts, step-down transformers. The motors will be attached, either by belt or direct-connected, to operate stamps, pans, hoists, crushers, elevators or pumps. It is expected that this installation will prove the most complete electrically-equipped mining plant in the world. The Westinghouse Company will also furnish all the necessary switchboard apparatus with the plants.

A Polyphase Transmission Plant for Guatemala.—Messrs. Siemens & Halske, of Berlin, have in course of construction a long-distance transmission plant which is to be operated by the "Empresa Electrica de Guatemala," and which is intended to carry electric energy for light and power purposes to the town of Guatemala from a waterfall 22½ miles distant. The system of transmission is the three-phase, at a pressure of 10,000 volts, with step-up and step-down transformers at either end of the line. Power is to be derived from the outlet of a lake giving 2,000 liters per second, with a fall of 87 meters. At present, therefore, some 1,300 H. P. is available. But it is contemplated in the near future to carry out works permitting the water of the lake to be accumulated during the daytime; this will bring the available power to 5,000 or 6,000 H. P. The plant now in view consists of a set of two horizontal Nagel and Raemp turbines of 520 effective horse power each, running at 200 revolutions per minute. Each turbine is coupled direct to a Siemens & Halske three-phase alternator capable of generating 425 kilowatts at a pressure of 350 volts. The current is transformed by a set of four transformers from the pressure of 350 to 10,000 volts, then transmitted to the town by a three-conductor aerial line having an aggregate section of 105 sq. mm., the maximum loss in the line amounting to 10%. On reaching the town the pressure is lowered again by another set of four transformers from 9,000 to 1,000 volts, the current being then distributed to the supply network of the town. The distributing conductors are overhead, carried on iron poles.

* Read before the American Society of Civil Engineers.

NEW RECORDING THERMOMETER FOR ATMOSPHERIC RANGES OF TEMPERATURE.

The novel and valuable feature of the recording thermometer described is that the recording portion may be located at a distance of 25 or 30 ft. from the point at which the temperature is to be measured.

This makes it possible to obtain a continuous record of the outside temperature while the recorder is located at a convenient point within doors where it may be readily observed and its mechanism is not exposed to the detrimental influences of inclement weather.

For cold storage plants where closed rooms are to be maintained at a constant temperature for the preservation of meats, fruits and vegetables, an instrument of this kind is of great value as the temperature may be observed without opening the doors. The recording part (Fig. 1) is an application of one of Bristol's recording pressure gauges. Fig. 3 shows an interior view of the recorder, which consists of a pen arm directly attached to the free end of a tube of flattened cross-section bent into

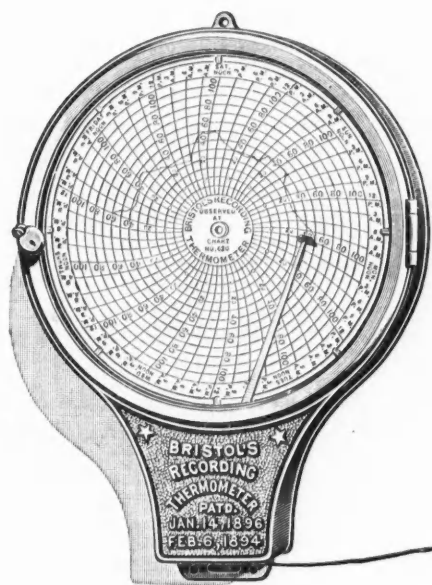


FIG. 1.

quired for barometric changes, as only high ranges of pressure are employed.

This thermometer is manufactured by the Bristol Company, of Waterbury, Conn., and at their New York branch, where one of the instruments may be seen in operation recording the outside temperature.

THE HUNT COUPLING FOR TRANSMISSION ROPE.

The rapid increase in the transmission of power by rope has made prominent one of the minor difficulties attending its use. This is the gradual lengthening of the rope which increases the sag until it becomes necessary either to resplice the rope or to use a take-up sheave with a very long range of motion. Rapid wear of the rope from slipping on the pulleys is frequently caused by lack of sufficient tension.

The Hunt rope coupling which we illustrate is designed to do away with all necessity for resplicing, etc., as it will keep a rope at exactly the

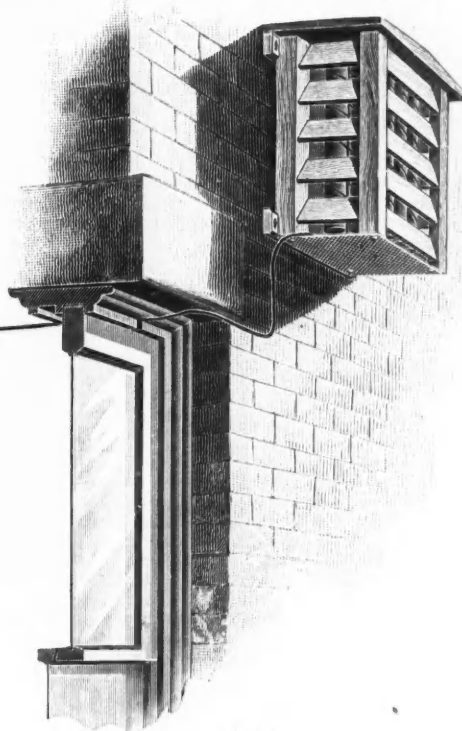


FIG. 2.

BRISTOL'S RECORDING THERMOMETER.

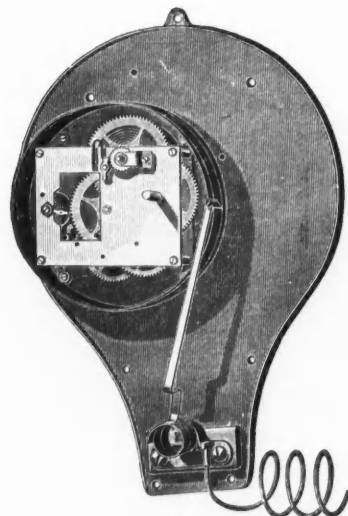


FIG. 3.

helical form. The bulb portion (Fig. 2) is placed at the point where temperature is to be measured. It consists of a series of helical tubes constructed on the same principle as that in the recorder. The helical coils are suspended in a vertical position with their lower ends free, the upper ends opening into the capillary tube connecting them with the recorder.

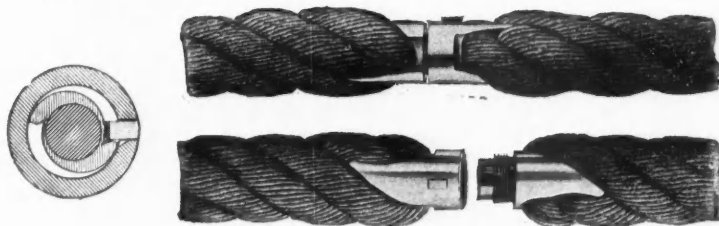
The system of helical tubes forming the bulb portion, the pressure tube of the recorder and the capillary connecting tube are completely filled with alcohol under pressure and permanently sealed. As temperature rises and falls where the bulb is located, there is a corresponding expansion or contraction of the alcohol, which is communicated to the recorder and registered on a seven-day chart graduated to read in degrees Fahrenheit.

Excessive pressures due to increased volume of the non-compressible liquid are provided against by the expansible form of the system of helical tubes of which the bulb is constructed. The total volume of the bulb portion is very large as compared with that in the pressure recorder, thus voiding the necessity of compensating for ordinary changes of temperature in the room where the recorder is located. No correction is re-

quired for the most effective service and long life, and do this with little or no extra time or attention being given the matter, and with no expense other than the first cost of the coupling.

The device is made wholly of aluminum bronze and has a tensile breaking strength of 60,000 lbs. to the square inch, and an elongation of 20% in 8 in., which is equal to the strength and toughness of mild steel. It is simple in its construction, there being but two parts, consisting of a screw and socket. These screw together when the rope is first put on the pulleys, and lock securely, so that the coupling can be separated only by using a wrench of special design.

An important and interesting feature of the coupling when screwed together is an internal swivel and ratchet, which we show in Fig. 3.



THE HUNT COUPLING FOR TRANSMISSION ROPE.

The swivel permits the joint to yield to the curvature of the pulleys while the ratchet holds the parts from revolving on each other and untwisting the rope. The Hunt coupling is made smaller in diameter than the rope with which it is to be used, in order that it may not touch the grooves of the pulleys, even when the rope is worn. The rope of the correct length for the drive when connected up, is spliced in the coupling, and as it wears longer, more "turns" are put into it by revolving one part of the coupling, the ratchet automatically holding all secure when the rope has the proper length and tension.

Where several independent ropes are run side by side on a pulley all can be kept at the same tension with the greatest exactness by putting a few more turns in the slack one when such a condition is noticed. By using this coupling, in a multiple rope drive, any single rope can be taken off in a few minutes and the work done by the remaining ones until it is convenient to put on a new rope, which can be done with equal dispatch and, what is of greater value, the tension adjusted to correspond exactly with the other ropes.

The cost of a rope drive, with this coupling spliced in and installed in position on the pulleys, is usually less than that of ropes spliced on the spot by the purchaser in the ordinary manner, and it is also less than a rope drive with a tension pulley, which, in addition to its cost, frequently requires space that is useful for other purposes. When we consider that a rope requires to be spliced two or three times during its life, while the couplings, having no wear, are permanent, with no further expense after once installed, it will be seen that this improved method is the cheaper as well as the better one.

The advantage, both in the convenience of installation, the facility of adjustment of tension, the perfect control of the sag, and the increased life of the rope from a more equal tension, will recommend the device to anyone who has had experience in this line.

The C. W. Hunt Company, New York City, are the exclusive licensees in the United States for the patent on this coupling, and are prepared to furnish transmission rope of the well-known "Stevadore" brand and of the usual sizes with the couplings spliced in position.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

CONSTRUCTION OF CONTRACT OF GUARANTEE.—A guarantee that a firm shall pay a corporation for all coal it may after such time sell to such firm applies to sales of coal afterwards made to such firm through the receiver of the corporation, since the appointment of a receiver for property by a Court of Chancery does not transfer title to the property.—Philadelphia & Reading Coal and Iron Company vs. Daube (71 Federal Reporter, 583), United States Circuit Court of Illinois.

EVIDENCE OF LOST MONUMENT IN SURVEY.—Where a party was entitled to recover land only upon proof that the place where a quarter-post had originally been set had been identified, so that it was not lost within the rule relating to relocation, a verdict for him was not sustained by evidence which failed to fix the point more definitely than that it was somewhere within a square covered by a circle, the radius of which was 50 ft. or more.—Wilkeson Coal and Coke Company vs. Driver, (43 Pacific Reporter, 889), Supreme Court of Washington.

RIGHT TO FOLLOW DIP IN MINING.—When the outcrop of a vein passes through the end line and one side line of a location, the locator may draw in the other end line to the point of intersection of the vein with the side line, and abandon what lies beyond; and he will then have the same extra-lateral rights as if the claim had been so located in the first instance. Even if the locator does not actually so draw in his end line, and abandon what lies beyond, a new end line will be considered as drawn at that point, and will have the same extra-lateral rights as if the claim had been so located in the first instance. The owner of a location having extra-lateral rights cannot follow the dip within the side lines of a prior location, which has the vein passing through both of its side lines, so that they are to be considered as end lines.—Tyler Mining Company vs. Last Chance Mining Company. (71 Federal Reporter, 848), United States Circuit Court, District of Idaho.

Cyanide Process.—B. de Wilde describes in the *Revue Universelle des Mines et de la Metallurgie* a modification of the cyanide process employed in the Transvaal, the United States and New Zealand. His procedure consists of three operations—the solution of the gold, the recovery of the excess of cyanide, and the precipitation of the gold. He does not find that the addition of oxidizing bodies to the solution of cyanide fails to produce any serious benefit. The mean consumption of cyanide is said to be 2 lbs. per ton of tailings; this quantity is capable of much reduction, probably down to quarter of a pound. The excess of cyanide is recovered by adding to the liquid ferrous sulphate, until a few drops of the filtrate begin to give a blue color on the addition of some drops of a solution of potassium ferricyanide. The gold remains in solution in the state of potassium auro-cyanide. The precipitation of the gold is based upon the following principle: In a solution containing the double potassium auro-cyanide, we precipitate all the cyanogen as aurous cyanide, and cuprous cyanide on acidifying the solution by means of sulphurous acid, and then adding a solution of copper sulphate. The least excess of this salt effects the absolutely complete precipitation of the gold.

New York Land Survey.—Verplanck Colvin, superintendent of the State Land Survey, has completed his report for 1895. The surveys have been carried on in the counties of Essex, Franklin, Hamilton, Herkimer and Warren, where great tracts of public lands required immediate attention for the restoration and preservation of their boundaries. At the same time the boundaries of counties, towns and townships have been fixed and permanently marked, and the topographical surveys for mapping purposes have been carried forward over large areas. The original surveys of New York, made in the colonial period, remain as the basis of all land titles in the forest districts, particularly in the northeastern counties; these original surveys were so imperfectly made by the first surveyors and with such insufficient records and total lack of stone monuments as to be now almost effaced and always obscure. Between these uncertain and obliterated boundaries are located some of the choicest forest lands yet remaining in this State, of which the State owns in 3,000 scattered parcels over 700,000 acres, and is seeking title to and will probably yet acquire five times that area for the purposes of the Adirondack Park and the State forest preserve.

Iron Industry in the Transvaal.—Various efforts have been made to take advantage of the concession granted many years ago, which still continues in force, but none have hitherto been successful. The promise of an import duty of £18 13s. 4d. on iron, steel or tin goods ready for sale has

not sufficed to induce capitalists to find money for such an enterprise, in face of the limited and necessarily varied character of the iron and steel imports into the Transvaal, but the imports have of late years increased so rapidly that something in this direction may again be attempted, with more success, before very long. The Rand has been very largely explored with a view to the development of the useful minerals, and about seven miles south of Middleburg there are excellent seams of coal, some of them 8 ft. thick, yielding on assay 87% of combustible matter and 13% of ash. This is a hard steam coal, similar to that of Northumberland, but containing more ash. So recently as 1889, coal from this locality, despite its abundance, was selling at £8 5s. per ton delivered at Johannesburg. One of the most remarkable mineral deposits of the Transvaal is an open working of coal, 10 ft. to 12 ft. thick, belonging to the Rand Coal Company, five miles south of Steen Kool Junction. This coal, which is free from slate, has only 6% to 8% of ash, and is acknowledged to be the premier seam of the country. Fifteen miles south of Middleburg there is an excellent seam of coking coal, and in the same locality there is a deposit of magnetite ore, which assays 66.23% of metallic iron. Iron ore is found in abundance in the same district, varying much in quality, and assaying 20% to 40% of metallic iron. In the "Bush Veldt," some 40 or 50 miles north of Middleburg, a large field of titaniferous iron ore exists, which is of good quality, and this district, unlike the Transvaal generally, also happens to be well wooded—so much so that it has been calculated that within a five-mile radius of the ore deposits there is a 16-years' supply of charcoal for one furnace. The nearest limestone to the Middleburg coal-field is, however, by road, about 50 miles away. This, until a railway is constructed, would be the most costly item, relatively, in the possible development of an iron industry in this district, as the transport of the limestone to the coal-field would cost probably about 60s. per ton, or 3s. per cwt.

PATENTS RELATING TO MINING AND METALLURGY.

United States.

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

WEEK ENDING MARCH 17TH, 1896.

- 556,457. **PROCESS OF MANUFACTURING MANGANESE METAL.** John W. Cabot, Johnstown, and Samuel W. Vaughan, Coopersdale, Pa. The process consists in introducing into a blast or other furnace a charge of slag from Bessemer converters, mixed with coke and limestone in the proportions of not less than 60 lbs. of coke and 60 lbs. of limestone to each 100 lbs. of slag, and reducing the same.
- 556,466. **CRUSHING MILL.** Frank A. Huntington, Oakland, Cal. A roller crushing-mill comprising an inclined crushing-bed, a series of rollers mounted on an axis parallel with the plane of the bed, a rotating driver having a series of hangers secured to it and each extending forwardly to a point in advance of its roller, arms extending from the axis of the rollers to a point in front of the rollers, and pivotally connected with the hangers, rigid guides for the arms and a feed-hopper having multiple delivery chutes, one of which delivers directly in front of each roller.
- 556,502. **ELECTRIC DRILL.**—Max Hebben, Butte, Mont., Assignor of one half to H. W. Turner, Silver Bow, Mont. Combination with a continuous, soft-iron casing having interior pole-pieces of a hollow armature-shaft having an armature adapted to rotate within and be wholly inclosed by the casing which constitutes the field-magnet of the electric motor, a drill-operating shaft longitudinally movable in and adapted to rotate with the hollow armature-shaft, a spur gear loosely mounted on the forward end of the motor and having an interiorly threaded hub meshing with an external thread upon the drill-operating shaft, a counter-shaft arranged in bearings beneath the casing and geared to the spur-gear, a gear loose upon the rearward part of the counter-shaft, an intermeshing gear fixed on the armature-shaft, a spring-pressed clutch sleeved on the counter shaft, and manually operated, means for throwing the clutch against the pressure of the spring, thereby disengaging the clutch.
- 556,509. **PROCESS OF PREPARING OXIDE OF ZINC PIGMENT.** George T. Lewis, Philadelphia, Pa. The method consists of treating the impure zinc oxide with water containing a caustic alkali or its equivalent in solution whereby the sulphur salts of zinc may be dissolved by the water and the zinc combined with sulphur reprecipitated by the alkali, then thoroughly mixing with the wet zinc oxide pulp thus produced oil in quantity sufficient to form a paste pulp with the zinc oxide in order to expel the water and soluble salts from the pulp, and then removing the aqueous solution of salts forced out by the oil to provide a commercially saleable paste paint.
- 556,567. **ORE CONCENTRATOR.** John B. Waring, New York, N.Y. A chamber rotating about a vertical axis and constructed to freely permit the flow of a liquid from its central to its peripheral portion, the chamber comprising a lower portion forming a discharge for the concentrate, an upper portion provided with a number of grooves arranged one above the other and the distance from the axis of the chamber to the bottom of each groove increasing from below, upward, and a connecting portion joining the upper and lower portions of the chamber.
- 556,568. **PROCESS OF PRECIPITATING IRON FROM SOLUTIONS CONTAINING IRON AND ZINC.** Emile Warzee, Brussels, Belgium. Patented in Germany, March 4th, 1894, No. 78,696. The method consists in adding zinc in excess and afterward blowing into the solution a current of air at a temperature of 90° C to produce oxidation, said air also serving to keep the solution constantly stirred.
- 556,626. **ELECTRIC FURNACE.** Adam C. Girard and Ernest A. G. Street, Paris, France. Patented in France May 25th, 1893, No. 230,341; in England July 8th, 1893, No. 13,340; in Germany August 2d, 1893, No. 81,479; in Austria-Hungary August 2d, 1893, No. 41,930 and No. 65,879; in Belgium September 9th, 1893, No. 106,309; in Switzerland September 14th, 1893, Nos. 7,460 and 7,562; in Italy September 30th, 1893, No. 267, and in Spain October 27th, 1893, No. 14,950. A heating chamber, and a passageway through it for receiving the object to be heated, combined with mechanism arranged in operative connection with the furnace and acting upon the object to feed it progressively through the heating chamber, an electrode projecting into the heating chamber, and suitable electric connections for producing a voltaic arc between the electrode and the object.
- 556,690. **PROCESS OF EXTRACTING GOLD FROM SOLUTIONS.** Giles O. Pearce, Colorado City, Colo. The process consists in passing the said aqueous solutions containing gold and platinum through a mass of vegetable carbon, sulphate of iron, oxalic acid and tartaric acid; arranged as shown to generate chemical electric reactions, of these elements, and to reduce and precipitate in the vat or vats the precious metals of gold and platinum, and so continuously preserving the efficiency of the combination.
- 556,691. **METHOD OF SMELTING GALENA.** Carl V. Petraeus, Joplin, Mo., Assignor to Oliver H. Picher, same place. The method consists in treating the ore in an open-hearth blast furnace and saving the lead fume driven off therefrom by screening, agglomerating said fume saved by screening and subjecting it to further smelting for the purpose of reducing it to metallic lead, treating the metal-bearing slag of the open-hearth furnace in admixture with agglomerated fume obtained by similar previous treatments in a low cupola-furnace and saving the fume driven off thereby in a separate screen system, agglomerating the fume so saved and charging it into the low cupola-furnace.

PERSONAL.

MR. HOWARD C. WALKER, vice-president of the Candelaria Durango Mining Company, of Durango, Mex., is in this city on business connected with the company.

MR. HERMANN A. KELLER, who has been superintendent of the Parrot S. and C. Company for almost five years, has resigned his position with the view of devoting his attention for the present to consulting work.

MR. FRANK L. NASON, geologist and mining engineer, has gone to British Columbia to superintend the installation of the plant of the Columbia Hydraulic Mining Company, of which he is the superintendent and engineer.

MR. J. H. BURFEIND, mining engineer and metallurgist, until recently connected with the sulphur mines at Black Rock, Utah, has opened an office at Salt Lake City, Utah, and will devote himself to professional work, examining mining properties and paying special attention to metallurgical operations.

OBITUARY.

We are officially notified by a committee of the Anglo-American Club of Freiberg, Saxony, of the death of ARTHUR VON BRAKENHJELM, a former member of the club.

JOHN M. STARK died in Wyoming, Pa., on March 14, aged 77 years. He was well known in coal-mining circles in the Wyoming regions, and was superintendent of the Pennsylvania Coal Company for a number of years.

JOSE JOAQUIN MUNOZ PALATA, a Spanish mining engineer, died at Caceres, Spain, on February 26th, aged 41 years. He joined the Spanish Mining Corps in 1880, since which time he had been practising his profession in the mining district of Caceres.

DAVID L. SUBLETT, a geologist and civil engineer of note, died in Chattanooga, Tenn., on March 24th, aged 59 years. For many years he has been in the Government service as assistant chief engineer on Tennessee and Kentucky river improvements.

MARSHALL McDONALD, one of the oldest and most widely known coal operators and river men in the Pittsburgh district, died at Sewickley, Pa., on March 20th. He was a member of the Pittsburgh Coal Exchange and of the Cincinnati Chamber of Commerce.

SAMUEL HAUCK died on March 19th, at Mechanicsburg, Pa., aged 70 years. In 1849, when the gold fever was at its height, he went to California, where he remained until 1853, when he returned to Mechanicsburg and bought an interest in the only foundry and machine shop in the town, and by his mechanical genius and industry soon brought these industrial works into prominence among the industries of Pennsylvania.

JOHN C. WINDER died on March 22d at Raleigh, N. C., aged 64 years. He was a graduate of West Point, and was engaged in important civil engineering work in various parts of the country. For four years he was chief associate engineer of the Croton Aqueduct at New York. He was also connected with the Seaboard Air Line, first as general manager, and then as Vice-President until last year, and ranked as one of the ablest railway men in the South.

PIO JOSUE Y BARREDA, a celebrated Spanish mining engineer, died at Barreda, Spain, on February 29th, aged 80 years. In 1845 he joined the Engineering Corps, and from that time he became one of the foremost mining men of Spain, especially in connection with the Real Compania Asturiana. The zinc mining industry of Spain owes much to his labors in Santander. He developed and successfully worked the Reocin mines and distinguished himself in many other ways.

THOMAS LINCOLN CASEY late Chief of Engineers, United States Army (retired), died in Washington, D. C., on March 25th. He was born at Madison Barracks, Sackett's Harbor, New York, in 1831. In 1848 he received an appointment to the United States Military Academy as cadet at large, and four years later graduated at the head of his class. Entering the engineer corps as second lieutenant in 1852, he was assigned to duty in connection with works of improvement in Delaware river and bay. At the outbreak of the civil war he was sent to New England as superintending engineer of the permanent defenses and field fortifications on the coast of Maine. In March, 1865, he was brevetted Lieutenant-Colonel and Colonel "for faithful and meritorious services during the war." As superintending engineer of public buildings and grounds in the District of Columbia he was placed in charge of the Potomac aqueduct, and to him also was committed the completion of the State, War and Navy Department building, the Washington National Monument, the construction of the medical museum and library. From 1886 to 1888 he was President of the Board of Engineers for fortifications and other public works at New York, and on July 6, 1888, he was appointed Brigadier-General and Chief of Engineers by President Cleveland. In October, 1889, he was charged by act of Congress with the con-

struction of the Congressional Library building, and in appreciation of his ability Congress continued him after retirement in charge of the work "until completion." It was in pursuance of this duty that Gen. Casey was stricken down to-day.

INDUSTRIAL NOTES.

The Zanesville, O., Water Works will be improved by the addition of a 7,000,000-gal. pump, for which proposals will soon be received.

The Wagoner Manufacturing Company, Hamilton and Sidney, O., is negotiating for the removal of its foundry and machine shop to Muncie, Ind.

Proposals are wanted by Mr. C. W. Hodgkinson until April 7th for the construction of an iron bridge across the Des Moines River at Emmetsburg, Ia.

The Schoen Pressed Steel Company, of Allegheny, Pa., has succeeded the Schoen Manufacturing Company, the capital stock being increased to \$1,000,000.

The American Tool & Machine Company, of Atlanta, Ga., has been granted a charter, with a capital stock of \$100,000, to manufacture car couplers, machine tools, etc.

The Cornwall Anthracite Furnaces, at Cornwall, Pa., built in 1859, and owned by the Lackawanna Iron and Steel Company, of Scranton, Pa., are being dismantled.

Poulterer & Co., of Philadelphia, have purchased the old Gaylord Rolling Mill, at Portsmouth, O., and the Wampum (Pa.) Furnace. They will dismantle both works.

The Joliet, Ill., Branch of the Consolidated Steel & Wire Company suffered a loss of \$150,000 by fire on March 23d, throwing 500 men out of work. The fire started from the shafting.

Proposals are wanted by R. H. Gamble, city engineer of Lima, O., until April 2d, for the construction of a steel bridge with stone abutments over the Ottawa River at that place.

A. P. Wilmer, secretary of the Wise County Coal Company, Abingdon, Va., wants to correspond with manufacturers of coal washing plants, with a view of contracting for a 400-ton equipment.

A portion of the smelting works of the Pennsylvania Salt Company, at Natrona, Pa., was destroyed by fire on March 21st, involving a loss of about \$100,000, said to be fully covered by insurance.

The Union Iron and Steel Company, of Youngstown, O., is now manufacturing and shipping to Bombay, India, a large shipment of cotton ties which will be used in packing the present crop of cotton.

Northern capitalists, through Dr. E. L. Dodge, of Brooklyn, have purchased 1,300 acres of land in Prince George and Surrey Counties, Va., for \$65,000. The land is said to contain deposits of good clay for brick manufacturing.

The Berlin Iron Bridge Company, of East Berlin, Conn., have a contract with the Carteret Steel Company, of Carteret, N. J., for a steel frame to support the furnaces which are to be placed in the new iron building which the Berlin Company is erecting for them.

The Manufacturers' Advertising Bureau, Benj. R. Western, proprietor; Jas. H. Williamson, business manager and press agency, which has been located for a number of years at 111 Liberty street, New York City, will remove about April 15th to more commodious quarters at 126 Liberty street. This concern is widely known both in this country and abroad.

The Glendon Iron Company, one of the oldest concerns of its kind in the Lehigh Valley, made an assignment last week for the benefit of creditors, naming as the assignees J. Tatnall Lea, of Philadelphia, and Francis C. Gray, of Boston. The financial depression is given as the cause for the assignment. The company's plant is capitalized at \$1,000,000.

The plant at St. Joseph, Mo., which was built for the manufacture of cut nails, is being remodeled by a new company, named the St. Joseph Bar and Axle Company, which proposes to make merchant bar iron, car axles, links and pins. The works are expected to be in operation by the middle of April. G. T. Walker has made the necessary arrangements, and will manage the plant.

A nickel steel Harveyized sample plate, representing the 5-in. armor manufactured by the Carnegie Company for the Russian Government, was tested at the Naval Proving Ground, Indian Head, Md., on March 24th, by Captain Sampson, Chief of the Bureau of Ordnance, and his assistants, at the request of the Russian Government. Six shots were fired at the plate with a velocity of 1,700 ft. a second. Five of the shots were from a 4-in. gun and one was from a 5-in. gun. The plate withstood the shots and passed the test successfully.

The Michigan-Peninsular Car Company, of Detroit, Mich., have placed contract with the Berlin Iron Bridge Company, of East Berlin, Conn., for a new foundry building 160 ft. square. This building is one story high, has a steel framework throughout, and is so designed that the lower chords of the trusses support runways extending the whole

length of the building. These runways carry trolleys having a capacity of 2,000 lbs. By means of these over-head trolleys the molten metal is conveyed quickly and easily from the cupolas to any part of the casting floor.

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.

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GENERAL MINING NEWS.

The Western Oil Men's Association has been recently organized at Toledo, O., and has already a membership of 200 producers, refiners, and others engaged in the oil business in Ohio, Indiana and other States.

ARIZONA.

COCHISE COUNTY.

CASEY.—This mine, in the Dos Cabezas district, has been sold to Hall & Sullivan for \$80,000. This property has been developed to a limited extent and the showing is good.

PIMA COUNTY.

ORO BLANCO DISTRICT.—This district is attracting attention. One of the most promising discoveries is the Sorrel Top, owned by Bogan Bros. & Perry. It is a ledge of silicious porphyry, carrying some \$15 per ton in free gold—a free milling ore, easily crushed and unmixed with any foreign metal that interferes with amalgamation. The Sorrel Top adjoins the Louise, one of the three patented claims known as the Franco-American group recently purchased by the Franco-American Mining and Milling Company. The Hart mine, just south of the Franco-American, is working full blast with its 10 stamps and a complete force on good ore. The Austerlitz group is preparing to start its mill as soon as Mr. Barclay, the head of the company which recently bonded the mine, is sufficiently recovered from a severe illness to resume his duties.

WASHINGTON CAMP.—A press dispatch from El Paso, Tex., states that the Westinghouse interests have secure control of the Washington Camp group of copper mines, and will take possession of the defunct International Copper Smelting Plant in El Paso this week. The price paid for the mines is said to be \$70,000.

YUMA.—The old Yuma mine, about 19 miles from Tucson, has passed into the hands of the Tucson Mining and Smelting Company. This company is paying for all the ore received, and is buying properties in order to get all the ore it can handle.

YAVAPAI COUNTY.

QUEEN GOLD MINING COMPANY.—The incorporators of this company are Samuel Hubbard, Sr., Samuel Hubbard, Jr., W. F. Hull, Alexander Radcliff, Frank Hull and T. G. Norris. The principal place at which they propose to transact business is Prescott. The corporation's work now in hand is the development and operating of the Golden Rule and Missing Link mining claims, situate a short distance west of Prescott, in the Thumb Butte neighborhood and in the Golden Standard mining district. These mines are only a few miles from and in the same mineral belt as the famous Last Chance mine. The district contains many fine gold quartz prospects and yields much coarse placer gold of high grade.

CALIFORNIA.

AMADOR COUNTY.

KENNEDY.—This mine, on the mother lode, one mile north of Jackson, has a good supply of sulphurets on hand. The chlorination works, which have been idle for several months, have started up. Work is going on at the 2,000-ft. level, with large bodies of ore in sight.

NEWTON.—Recently water was taken out of this copper mine and two winzes sunk in the north drift of the 400-ft. level, out of which a number of tons of ore have been mined and shipped to a smelter for a test. The man who is operating the property comes from Arizona and represents some wealthy copper men who will take the property, if the tests prove satisfactory.

(From Our Special Correspondent.)

ONEIDA.—At this mine, two miles north of Jackson, the temporary plant has been completed and the work of sinking the shaft is progressing rapidly. At the depth of 1,800 ft. their surveys show that the ledge will be struck.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

BIG SEVEN.—This mine has been bonded by T. W. Webb, who has a force of men developing it. There are two large veins running through the claim which assay about \$14 per ton. A tunnel is to be run to tap the ledges at a depth of 200 ft.

THORPE.—This mine, on the mother lode, one

mile east of Forth Crossing, has a large body of pay ore in sight. At the 300-ft. level drifting has been done and crosscutting shows the chute to be about 14 ft. wide. The shaft is down 430 ft. and is still sinking.

INYO COUNTY.

(From Our Special Correspondent.)

CONFIDENCE MINING COMPANY.—This company has started up its mill in Death's Valley, about 18 miles north of Saratoga Springs. There are 25 men employed.

KERN COUNTY.

(From Our Special Correspondent.)

NORWAY.—This mine, eight miles northeast of Kohn, in Last Canyon, is comprised of a gravel bank from 300 to 1,500 ft. wide, with a gulch on each side. There are now over 1,000 ft. of tunnels which have paid well on the bed rock with dry washers. A shaft has been sunk in the center of the bank for ventilation. This shaft has been prospected from the top to the bottom and is found to pay from 25c. to \$2.50 per cubic yard.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

CLARK.—At this mine development work is progressing rapidly. The extension of the northeast drift, which is now in 100 ft., is all in ore. The lead is 14 ft. thick in the breast of the drift.

PLACER COUNTY.

(From Our Special Correspondent.)

PAGE & BUCKMAN.—The main tunnel at this mine is being pushed ahead to crosscut the ledge on a lower level. The two-stamp mill is running steadily on pay ore.

HERMAN.—This mine, near Secret Canyon, is being worked successfully. The ledge they are now working is 14 ft. wide and well defined. A good body of ore is being opened up in the lower tunnel, now in about 500 ft., and which crosscuts the ledge about 180 ft. below the surface. The 19-stamp mill, with a force of 20 men, produced almost \$5,000 last month. The milling plant will be increased.

RIVERSIDE COUNTY.

(From Our Special Correspondent.)

DESERT QUEEN.—This mine, near Perris, formerly owned by the McHaney Brothers, has passed into the hands of H. C. Steele and others, of Perris. They will resume work at once.

SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

VIRGINIA DALE.—At this mine, which is located about 120 miles east of San Bernardino the five-stamp mill has been sanded out of sight and abandoned. The mill was located in a depression and recently one of the sand storms, for which this section is famous, completely buried the mill, and as it would involve an outlay of more than its value to dig it out, it has been determined to abandon it and put up a new 10-stamp mill.

SIERRA COUNTY.

(From Our Special Correspondent.)

BUTTES SADDLE COMPANY.—Work is being pushed in tunnel No. 3, which will tap the ore chute with 650 ft. backing. One chute is 95 ft. long and the other 140 ft. The pay chimney averages about 5 ft. in thickness. An upraise was made 140 ft. above No. 2 tunnel, and the ledge was found to be 9 ft. thick. The ore averages from \$5 to \$8 per ton.

RISEING SUN AND EARLY DAWN.—This placer mine at Sierra City has an abundance of water power to run the pump and hoist, and a ditch over 1,000 ft. long has been brought in from Reis ravine, which furnishes about 100 in. for washing gravel. The incline is down 170 ft. and the gravel looks well.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

MONARCH.—This mine is on French Creek. The pay chute is from 3 to 7 ft. wide, the pay ore assaying from \$6 to \$9 per ton.

MOUNTAIN KING.—This mine is located near the junction of Eliza Fork with the north fork of the Humbug Creek. The tunnel 375 ft. long, which taps the ledge at a depth of 400 ft., has been completed. They are now at the east end of the pay chute and have a good ledge 3 ft. wide. The tunnel will be carried to the center of the pay chute.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

GRANT.—This mine is located at Grizzly Gulch near Moccasin Creek on the Mother Lode. The development work done shows the vein to be 48 ft. wide. The rock is free milling, carrying about 2% of sulphurets worth about \$135 per ton. Two shafts have been sunk near the south end of the claim No. 1 sunk at a point 20 ft. from the hanging wall cut the vein at a depth of 50 ft.; at 40 ft. a crosscut was run into the foot wall. Fifty feet north an incline shaft No. 2 has been sunk following the hanging wall to a depth of 45 ft. Tunnel No. 1 has been driven into the hill 80 ft. cutting the vein 25 ft. below the surface and running about 12 ft. into the slate with a branch running parallel with the vein into the slate southward. This tunnel has cut a large number of seams and stringers which are rich in fine gold. In tunnel No. 2 run south of No. 1, at a distance of 120 ft. running ground was met and work was expensive; it was abandoned. Tunnel No. 3 is now in 135 ft. striking the ledge

70 ft. below the surface; they are now 10 ft. in the quartz. Arrangements are being made for first-class machinery for pumping and hoisting. The main shaft will be sunk 500 ft. Water-power is available six months of the year.

RAPPAHANNOCK.—At this mine, 1½ miles northwest of Jamestown on the Mother Lode, a strike has been reported at a depth of 300 ft. The vein shows 20 ft. of rich ore.

COLORADO.

BOULDER COUNTY.

BUCKEYE.—Several strikes in this group were made this week. The ore will be stored until summer, when the new process will be used.

CELESTIAL.—A new hoister is being put in and development will be resumed next week.

LIVINGSTONE.—W. L. Davis and M. F. Chamberlain brought suit this week for damages against C. A. Russell for an alleged wrongful survey made by the latter whereby the developments made on the mine were rendered practically worthless. The plaintiffs were non-suited owing to a flaw in the complaint.

MODOC.—The liabilities hanging over this property have been liquidated and development will be pushed to its fullest extent.

PRESIDENT.—Walcott & Hansell are working this property. The shaft is down nearly 150 ft. and is in good ore.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

ECLIPSE.—The upper level has been driven 350 ft. and it is reported that work through the shaft will commence by April 15th. The present streak is 6 in. wide, with values in lead and silver.

GUM TREE.—Denver parties recently took charge of this mine, and began drifting in the lower level eastward. They opened out a 15-in. of solid copper-lead ore.

PLACER MINING.—Both the Clear Creek and Prince placer companies are getting in shape for the beginning of summer work under the California system of hydraulic mining.

RISEING SUN.—Omaha parties are working this mine, and, after driving the lower level but 30 ft., cut a body of ore which shows up well; 8 inches of the streak running \$150 a ton.

SILVER RING.—The two adits are in 700 ft. each, in both of which there is a showing of mineral. The upper level has a showing of gray copper and runs 300 oz. silver to the ton.

EL PASO COUNTY, CRIPPLE CREEK DISTRICT.

(From our Special Correspondent.)

ANCHORIA LELAND MINING COMPANY.—The Chance on Gold Hill, owned by this company, is doing well and never yielded as much ore as at present. Thirty-six men are employed. On the Chance ground the shoot of ore has been proved to be over 200 ft. long, and has been stoped for over 200 ft. in height, with good bodies of ore. At the bottom of the 250-ft. level the vein varies from two to seven ft. in width, and averages by carload lots from 3 to 5 oz. per ton. The Anchoria Leland Company is erecting a substantial plant for the new shaft which is now 170 ft. deep, two boilers of 80 H. P.

The new machinery will be in working order on or about May 1st next, at the time when all the leases expire. At the depth of 160 ft. a stringer 12 in. wide came in the shaft from the east which assayed 10 and 12 oz. At the depth of 300 ft. the first station will be cut, and a short crosscut extended to the vein, and levels extended both north and south the full 700 ft. which the company owns on the vein. The company is prepared to sink a shaft 1,000 or 1,500 ft. irrespective of the productiveness or otherwise of the veins. The output of Gold Hill has fallen off, and the same remark applies to Battle Mountain, but the output of the other hills have increased though not to the extent that the former two have decreased.

FAVORITE.—This property on Bull Hill is now being worked by the company of the same name. A contract was recently let to sink the present shaft 45 ft. deep, an additional 100 ft., the size of shaft 3½ × 7 ft. within. The company to have a steam hoist ready to work before the shaft is 100 ft. deep. The pay streak in the shaft is about 18 in. of \$64 ore; the rest of the vein sampled, after sorting, from 1½ to 2 oz. The lessees from their surface scratchings, the deepest shaft being less than 80 ft., sold 1,400 tons of ore which netted \$35 per ton.

MIDGET.—This mine on Gold Hill employs 12 men. The shaft has been sunk vertically 300 ft., and a crosscut is being driven east to intersect the Bonanza King vein, which had such a promising appearance at 30 ft. deep. The company will sink the shaft still deeper, in order, if possible, to intersect the New-Moon-Anchor ore-shoot which dips to the south.

NELLIE.—This mine, on Squaw Mountain, is fast coming to the front, and the lessees are working 45 men, as the lease expires on June 1st. The shaft has been sunk 150 ft., and a drift will be extended at that point about 55 ft. before the ore shoot is encountered. The output is now one car every four days of ore sampling from 7 to 10 oz.

NEW MOON ANCHORS.—This company on Gold Hill shipped this week five cars of over 5 oz. ore. The mine employs 42 men. The ore shoots in both shafts improve with depth.

TEMONJ.—This property, on the north slope of Gold Hill, and being actively worked by John E. Smith,

is still without ore. The shaft had been sunk vertically 300 ft. A crosscut was driven east 160 ft. to strike the New Moon-Anchor vein without success. A second crosscut is being driven west to find it the New Moon-Anchor vein having split before it reached the Temonj side lines.

THOMPSON.—This claim on Raven Hill, situated south and east of the Elkton claim, has recently been sold to Chicago people. This claim was formerly owned by the Physicians' Mining and Milling Company, of Denver. A shaft has been sunk 245 ft. and at the 200-ft. level a crosscut has been extended east 154 ft. Twenty tons of rock were taken from the dump, which sampled \$11 per ton, and 30 tons of rock from the opposite side of the dump, but the returns of the latter are unknown. The Chicago purchasers have incorporated the claim under the name of the Thompson Company. Stock \$1,500,000 in \$1 shares; treasury stock, 500,000 shares. A new steam hoist has recently been erected.

VOLCANO.—This claim, located just south of town, is being worked by 12 men, sinking the shaft below the 150-ft. level. The vein is small, yet yields some remarkably rich assays. The formation is granite and there is plenty of water.

GILPIN COUNTY.

(From Our Special Correspondent.)

CARROLL.—A Denver company is reopening this mine on Eureka Hill. The water has been hoisted from the shaft which is being retimbered.

COTTONWOOD.—The first shipment from the camp, of any value, was made last week, a ton of ore from the Greenhorn claim having been shipped to the Denver smelters, realizing \$80.

HAZELTINE.—This mine in Willis Gulch is being restarted by lessees who have retimbered and repaired the tunnel and are erecting a new shaft-house. The property includes a concentration mill, which is to be run on the lower-grade ore. The mine at one time yielded a good deal of rich smelting ore.

HILL.—This mine in Hill Ranch, Elkhorn Gulch, was at one time a large producer, but has remained idle for some years. It has now been taken up on lease and bond by an English syndicate, who are also prospecting on other known gold-bearing veins along the north line of the ranch.

WOOD & BUCKLEY.—Work has been recommenced at this mine in Eureka Gulch. The vein is one of the largest in the district, being said to show over 14 ft. of ore at one point. The ore is pyritous and low grade, but will probably pay for treatment by concentration. The shaft has already been drained, but most of the drifts are badly caved and will take some time to reopen.

LAKE COUNTY.

(From Our Special Correspondent.)

A. Y. AND MINNIE.—It is reported that the owners of this property will adopt a new process for the treatment of their low-grade ores, and will work the mine themselves. In the early days the company had no way of saving on their low-grade stuff, but this has been overcome by a new process.

CITIZENS MINING AND LEASING COMPANY.—This company is now thoroughly organized. Thos. Robson is president; R. J. Allison, vice-president; J. Stillwell, secretary, and J. S. Reef, treasurer. A committee has been selected to find suitable ground upon which to begin development work. The new company is composed of 100 Leadville business men, and will work on the co-operative plan.

DENARGO.—Work is being prosecuted at the 500-ft. level of the Mike & Starr shaft, and 25 tons a day of copper sulphide are being shipped. The stuff is in occasional streaks.

HUMBOLDT.—This property has just been leased to parties who are conducting operations at the 400 ft. or carbonate level. Some very fine mineral has been passed.

LEADVILLE MINE LEASING COMPANY.—This company is developing the Sixth Street property. Seventy-five tons daily of manganese iron and 25 tons of higher grade ore are being shipped. C. E. Osgood is local manager.

LIONS GOLD MINING CO.—This is a new company that is preparing to operate on the Mountain Lion properties on Bald Mountain. This group is largely owned by Chicago people, but owing to some disagreement work was suspended there some time ago.

LONG & DERRY.—The decision of the Supreme Court this week confirming the title of R. B. Estey and others to this property ends a long litigation and important work will follow. The property consists of 50 acres of valuable territory.

MAHALA MINING COMPANY.—The new ore body found in the winze has developed into a fine ore body and 150 tons a day of good ore is now being shipped.

NEW ELKHORN MINING COMPANY (LIMITED).—Mr. F. Robbins, of California, is the new manager in place of T. Kyle resigned. The company is preparing to develop some virgin territory north of Big Evans gulch and a new shaft has already been started.

NEW YEAR CONSOLIDATED MINING COMPANY.—This company has filed suit against the Resurrection Gold Mining Company in the sum of \$100,000. Plaintiff alleges that it was wrongfully ousted from eight claims, none being operated by the Defts.

STAG MINING COMPANY.—These people have

leased the Niles-Augusta property to Mr. George Campion. This ground lies east of the Bison, and a few years ago was a very rich producer. The shaft is down 360 ft., and vigorous new work has been commenced.

TURBOT LEASING COMPANY.—In the Chip shaft the lead body has opened up wonderfully well, and at present shows over 35 ft.; 25 tons a day of good ore are being shipped.

VIVIAN MINING COMPANY.—Operations have been commenced on the stone shaft of this group, located on Rock Hill. The old shaft is being enlarged and retimbered, and will then be sunk to the sulphide contact.

YAK.—This great tunnel is piercing Iron and Breece hills, and is in over one mile. Connection has been made with the south shaft of the Mike & Starr property, and this shaft at a depth of 560 ft. is now the main base of operations. The objective point of the tunnel is Idaho Park.

IDAHO.

OWYHEE COUNTY.

TRADE DOLLAR.—It is reported that an important strike has been made in the main tunnel of the Trade Dollar mine, at Silver City, under the superintendency of James Hutchinson. This tunnel has been following the vein, and has been driven 4,300 ft. It had previously opened several distinct ore chutes from which the large gold and silver production of the property has been maintained. It has now developed another, which seems to be far larger and richer than any of the others. The entire face of the tunnel is said to be in ore. The mine is to be further developed by sinking from the tunnel level at a point 3,000 ft. from the entrance. For this purpose an electric plant is being provided. The new strike is nearly under the apex of Florida Mountain.

SHOSHONE COUNTY.

CONSOLIDATED POORMAN & TIGER.—Fire destroyed the compressor mills of the Poorman & Tiger mines at Burke last week, entailing a loss of \$200,000; fully insured. The fire will probably close down these mines for six months.

KANSAS.

CHEROKEE COUNTY.

(From Our Special Correspondent.)

HOLMES' LEASE.—The Columbia plant has been shut down for four weeks and a new concentrating plant is being put in under the direction of Geo. Cooley. It will be equipped with the latest improved patterns of his steam jigs, being a six-cell rougher and a four-cell cleaner, with a different speed for each screen. A new set of rolls will be added and the machinery will be run by power furnished by a new 60-H. P. boiler and a 50-H. P. engine. The plant when completed will cost about \$7,000. It will probably be in running order in two weeks. Mr. Holmes now has in the bins 400 tons of zinc ore and about \$1,000 worth of chats.

MASTEN LAND.—At the Sunflower mine they are working an upper level on a good run of lead in open ground, which produces about 25,000 lbs. lead ore every week. In the lower level they have a face of zinc ore 30 ft. high which they are unable to work on account of the strong water. This week they are pumping an 8-in. pump and soon as they get the water out will put in a force of men.

RICE, DAVIDSON & BAKER.—On the Masten land is located the Rice, Davidson & Baker mine, in which they started at 80 ft. a 9-ft. drift on a rich run of lead ore in open ground. In six weeks from the time the shaft was started the ore was struck in paying quantities, and last week they made an output of over 20,000 lbs. of lead ore. They have good lead dirt in the bottom of the drift.

RICHLAND COMPANY.—On this company's lease of 10 acres there are nine producing shafts that last week made the following turn-ins: Star, 2,020 lbs. lead and 25 tons crush ore; Black Fly, 4,700 lbs. lead and 40 tons crush ore; Gold Coin, 15,800 lbs. lead and 70 tons crush ore; White Swan, 9 tons crush ore; Jackson & Co., 3,150 lbs. lead, 5½ tons of zinc ore and 50 tons of crush ore; Butterfly, 12½ tons crush ore; Dwight & Co., 2,440 lbs. lead and 11 tons crush ore. The crush ore is sold to the Chatters, who have steam concentrating plants.

TEMPLAR LEASE.—The Annie Rooney mine on the Templar lease is keeping up her old time output. Last week they turned in 232 tons of rough ore, 40 tons of free zinc ore and 15,000 tons of lead ore. The company is running a drift to another shaft that is being sunk for water and will hoist from both shaft and have two wash places. This output will largely increase them.

MICHIGAN.

COPPER.

HURON, ISLE ROYALE AND PORTAGE.—It is said that the option on these copper mines in this district will be closed, and the mines consoldated, opened, and operated. Nathan Leopold, of Chicago, who holds the options, says that English money will put the mines in shape. The amount of the option is supposed to be \$125,000, and it will take \$500,000 more to get the properties in shape for business.

MINNESOTA.

(From Our Special Correspondent.)

NORTHERN MINERAL WORKERS' PROTECTIVE UNION.—Branches have been established on the Vermillion range, at Tower and Ely, both being

large. The society as a whole, though only four months old, has 10,000 members, most of whom are on the lower ranges, while the Minnesota ranges are now both organized.

During the winter about \$175,000 has been the payroll of the active mines in the Mesabi and Vermillion ranges. With the opening of navigation this amount will be increased to at least \$400,000 in addition to the outlay at docks and railway points.

The work of the Duluth & Iron Range Railroad in cutting down grades, straightening curves, laying a double track and otherwise improving the line from its Mesabi junction point to the docks, is a far larger enterprise than is generally supposed and is giving employment to a force of not far from 500 men. Grades are being materially reduced and curves are much less than formerly.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

DUNN IRON COMPANY.—This company, very well known on the older range, has taken options on 33 40-acre tracts in the eastern Mesabi, between Biwabik and McKinley, and will at once begin explorations. Considerable ore has been found on parts of these lands in time past, but generally of rather poor quality. It is hoped that careful work will bring to light large bodies of better ore.

HALE PALMER EXPLORATIONS.—These explorations, on six 40-acre tracts in 34, 58-17, expire April 1st, and will be closed on 160 acres, where a valuable body of ore has been uncovered. It runs about 62% in iron and is low in phosphorus, but the ore is exceedingly fine in texture. A body of ore about 1,000 × 600 ft. has been shown up, and, while no steps have yet been taken to prove its depth, it is known to be very deep.

LAKE SUPERIOR CONSOLIDATED MINES.—This company has been exploring under working option a large area of lands in various parts of the range belonging to A. M. Miller, of New York. The option was this week allowed to drop.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The metal market was firmer last week, with pig lead rising toward the close. The price paid for ore last week was about the same as the week before. The top price for zinc ore was \$23 per ton, with an average of a little better than \$21 per ton. The output of zinc ore during the week equalled the amount sold, still leaving on hand about 900 tons of zinc ore unsold. The price paid for lead was \$16.75 per thousand with 50c. added for hauling. The output of lead was about the usual amount, but the sales were less. The turn-in from the different camps were as follows: Joplin zinc, 1,229,020 lbs.; lead, 329,540 lbs.; value, \$19,121. Webb City zinc, 603,560 lbs.; lead, 22,350 lbs.; value, \$6,718; Cartersville zinc, 1,507,230 lbs.; lead, 284,980 lbs.; value, \$21,166; Galena, Kan., zinc, 2,120,000 lbs.; lead, 308,000 lbs.; value, \$24,792; Stott City zinc, 129,400 lbs.; value, \$1,358; Oronogo zinc, 40,160 lbs.; lead, 23,730 lbs.; value, \$683. Totals for the district: Zinc, 5,629,370 lbs.; lead, 968,400 lbs.; value, \$73,838.

CHILWOOD HOLLOW.—The Chicago Consolidated Company, which operates a valuable mine on the Leonard land in Chilwood Hollow, two miles west of Joplin, has awarded the contract for building a \$5,000 concentrating plant to W. E. Johnson. The plant will be equipped with a 100-H. P. boiler, a 100-H. P. automatic engine to run the machinery, a 25-H. P. engine for the pumps, a crusher, two sets of rolls, a six-cell rougher and a five-cell cleaner, three elevators and a friction hoister. When this plant is completed another will be erected at the Nicholasville mine on the Yale & O'Brien lease adjoining the Leonard lease, and the power will be transmitted from the Chicago Consolidated plant to run this plant. Mr. E. Hedburg, the superintendent, has worked hard to develop both of these mines.

MCGEE & CANNON.—This property is located on the Get There lease, near Cartersville. They are drifting at 145 ft. on a 9 × 50 face of lead and zinc ores in hard ground and no water and are producing over 40,000 tons of lead and 10 tons of zinc ore each week, which they concentrate on six hand jigs. In sinking the shaft they went through 90 ft. of hard limestone and 30 ft. of hard flint they were nearly a year in sinking it and it cost about \$2,000. It now is paying good dividends.

QUINTUPLE MINING COMPANY.—This company has leased 105 acres of the Miller land, two miles north of Joplin. There are 21 prospect shafts going down on the lease. In the company's shaft they are drifting at 115 ft. on a 13-ft. face of zinc ore in open bouldery ground, and hardly enough water to clean the ore. The ground is open, and it cost very little money and a short time to sink a shaft to pay dirt. Last week they made their first turn-in of 15 tons of zinc ore. Brien & Co. on this lease struck a good run of lead and zinc ore in soft ground at 35 ft., but will sink deeper to find out how large a face they will have to work.

REX TRACT.—Norsworth Porter & Co. on the Rex lease have moved their plant to their lots near the company's office where they have two shafts down 85 ft., and will hoist dirt from two drifts, each carrying a 12 × 24-ft. face of zinc ore in open ground. They have not enough water and will flume it from the company's pump about 2,000 ft.

WHITE ALLEY.—This company is operating four lots on the Grounds & Irwin lease and has built a first-class concentrating plant equipped with 50 H. P. boiler, a 40 H. P. automatic engine, a 10 in. crusher, 2 sets of rolls, a 4-cell rougher and 4-cell cleaner. They concentrate on the plant 200 tubs of crush ore, producing 8 tons of zinc ore every 10-hour shift. They are drifting at 100 ft. on a 12 × 12-ft. face of zinc ore in open ground and no water. They have a good run of lead ore at 60 ft. which they are not working at present. Last week in sinking a new shaft at 100 ft. they struck a large body of zinc ore in soft ground. The plant was completed on February 1st.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

OLE OLESON.—The Ole Oleson mine, east of the I. X. L. mine, is also showing every indication of opening up a new run of jack and silicate supposed to be a continuation of the run from the I. X. L. The output from the Ole Oleson last week was about 6 tons of silicate and 4 tons of jack.

RINKER LAND.—Yandall & Co. made an output of about 12 tons of zinc ore, but had to shut down owing to the stopping of the pumps for several hours caused by a breakage. Last week Wheat & Co. commenced sinking a shaft as did also Ewing Silman & Barber.

STEWART TRACT.—The rich strike of zinc ore at the I. X. L. mine on the Stewart land is attracting a great deal of attention to that old mine. About 40 tons of crush ore run through the Baldwin plant produced over 12 tons of the highest grade zinc ore making a showing of 30% ore. There are from 15 to 20 tons of crushed ore piled up at the mine to be concentrated.

MONTANA.

JEFFERSON COUNTY.

MAJOR BUDD.—There is a possibility that work will be resumed at this mine near Woodville in the early spring. It is said that the company will begin work by developing the present shaft on the property an additional 100 ft.

STATE AND URSA MINOR.—All the new machinery, hoist and boilers for the development of these mines, located at Little Boulder, are now quite ready for operation. These claims lie 11 miles southeast of Boulder, and are owned by P. A. Largey, George H. Tong, Chris. Johnson and Thos. H. Mitchell, of Butte. The development so far consists of a shaft 160 ft. deep, which will be sunk to the 300 as soon as possible. The vein is between 5 and 6 ft. between walls, and carries between 3 and 4 ft. of ore, which, is said to average \$40 to the ton in gold and silver, about equally divided.

MADISON COUNTY.

BOZEMAN.—This mine which was bonded by J. M. Merrill, John F. Cowan and P. A. Gerner, was this week sold to Henry Albertson, *et al.*, under bond for \$30,000, of which amount \$5,000 had been paid some time ago. The new owners will start at once to develop the property. Ten men are already employed. It is expected that a new 20-stamp mill will be erected as soon as the lumber and machinery can be put upon the ground. The Bozeman lies just one claim west of the Clipper group at Pony. The ore is 8 ft. wide of free milling ore, which is reported to run \$46 in gold.

WHITE PINE.—This mine at Pony has just made a good showing by a recent shipment of ore to Helena. One car of gold ore from this property netted \$1,300. The vein from which it was taken ranges from 8 to 16 in. The mine is owned by Thomas Carmen, and he has taken out about \$100,000 by tunnel development alone, and at no place in the property has a depth been reached below 200 ft.

SILVER BOW COUNTY.

BOSTON AND MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—The Atlantic shaft of this company has reached a depth of over 500 ft., and, while the promoters claim they have no defined ledge, it is known that they have mineral and plenty of it, says the *Butte Miner*. It is also true that they have encountered some very hard granite. With this comes also a large and ceaseless water current that, so far, by vigilance and hard work is being kept under control with the pumps. From three levels the water in the Atlantic is being kept cleared, but work has been practically suspended otherwise for the present.

MINNIE HEALEY.—This mine at Meaderville is to be thoroughly explored by a syndicate composed of James Finlan and Patrick O'Neill, of Butte, and Frank Wilson, of Denver, Colo. The present shaft is 250 ft. deep, but this will be sunk 100 ft. deeper, and crosscuts extended 250 ft. south to cut three leads known to exist in the claim.

MOONLIGHT.—Dave Bricker has struck ore in this mine in Butte, which he bonded for \$90,000, and has made a deal with the owners of the Colusa-Parrot, an adjoining property, by which he secured the privilege of running a crosscut from the lower levels of that property to a point on the Moonlight ground, where he hoped to tap the ledge. Recently the miners ran into a ledge 30 ft. in width, a large proportion of which is high-grade copper ore.

NEVADA.

STOREY COUNTY—COMSTOCK LODGE.

CHOLLAR MINING COMPANY.—At the annual meeting of this company, held in San Francisco, Cal., last week, 84,433 shares were represented and

the following directors elected: A. K. P. Harmon, Charles Hirschfeld, H. Zadig, E. P. Barrett and A. Krauss. The only change was the election of A. Krauss in place of Thomas Cole. A. K. P. Harmon was re-elected president; Charles Hirschfeld, vice-president; Charles E. Elliot, secretary, and H. M. Gorham, superintendent. The company has \$13,981 in its treasury.

HALE & NORCROSS MINING COMPANY.—The Virginia City Miners' Union has notified the President of this company that it will not permit any of its members to work under the new Superintendent. The miners having declined to make definite charges against Superintendent Tangerman, the President has ordered the mine shut down.

POTOSI MINING COMPANY.—At the annual meeting of this company held in San Francisco on March 11th, the old management was re-elected without opposition. The directors are as follows: A. K. P. Harmon, Thos. Cole, Charles Hirschfeld, E. P. Barrett and Thomas Anderson. A. K. P. Harmon was re-elected president; Thomas Cole, vice-president; Charles E. Elliott, secretary, and H. M. Gorham, superintendent. The company has a cash balance of \$8,311 in the treasury. At the meeting 83,000 shares were represented.

Following are extracts from the latest official weekly letters of the mine superintendents:

BELCHER.—The yield of the mine for the week was 33 carloads of ore, averaging \$27.04 per ton.

CONSOLIDATED CALIFORNIA AND VIRGINIA.—In the 1,650 level, on the fourteenth floor the south drift started at the south end of the stope has been advanced 10 ft. through quartz assaying 50c. and \$1 per ton; total length 47 ft. 1,750 level—we continue to extract some ore from the fourth, fifth and sixth floors above the sill floor of this level, working through upraise No. 2, and through the upraise No. 3 carried up from the end of the west crosscut No. 3 on the sill floor of this level. In working to the north on the west side of these openings the ore continues to show a width of 2 ft., assaying about \$34.25 per ton. From these openings and from the north end of the stope in old ground of former workings on the 12th, 13th, 14th, 15th and 16th floors, and from the northwest drift upraise on the east side of the ledge we have extracted 129 tons of ore, the average assay value of which, per samples taken from the cars in the mine, was \$51.46 per ton. From the upraise started at the 207-ft. point in the northwest drift from the main west drift from the C. & C. shaft, at a point 50 ft. above the sill floor, we have worked upward from the seventh to the ninth floor, following streaks of ore which show a width of 1 and 2 ft., and we have extracted therefrom about 40 tons of ore assaying \$21.50 per ton. 1,600 level—The east crosscut from the upraise 23 ft. above the sill floor of this level, at a point 230 ft. south of the north boundary line of the mine, has been extended to a total length of 47 ft. face being in old ground formerly worked, in which appear narrow streaks of ore and fillings that will pay to save. We have extracted from this opening six tons of ore, assaying \$36.35 per ton. 1,000 level.—The north drift from the Consolidated Virginia shaft station on this level has been advanced, passing through porphyry and clay to a total length of 621 ft. It has been connected with the drift run south from the Ophir shaft station on this level. The total extraction of ore for the week amounted to 126 tons, the average assay value of which, per samples taken from the cars when raised to the surface was \$44.74 per ton. The bullion produced from 1,169 tons and 1,630 lbs. of ore, worked at the Morgan mill, was shipped to the office in San Francisco, its assay value being \$24,735.

SAVAGE.—The yield of this mine for the week ending March 16th was 100 carloads of ore, of the average car sample assay of \$29.32 per ton. During the week we shipped to the Mexican mill for reduction over the concentrating plates 364 tons of ore. About 200 tons of this ore was second class. The balance was ore of the previous week's grade. The average battery sample of both lots was \$17.96 per ton. The concentrates average per ton: Gold, \$195.02; silver, \$389.76; total, \$584.78 per ton.

SEGREGATED BELCHER.—The yield of the mine for the past week was 29 carloads of ore, averaging by car sample assay \$30.13 per ton.

NEW MEXICO.

GRANT COUNTY.

SILVER CITY SMELTING AND REFINING COMPANY.—This company, which recently filed articles of incorporation, has leased the Flagler Smelting Works in Silver City and purchased and leased valuable mining properties in this county, including the Texas and Grand Central mines in the Central district and others. A force of men is now at work putting the smelter in condition for business, and enough ore has already been contracted for to insure a long run. Incorporators: George S. Cartwright, of New York; Robert B. Benham, of Philadelphia, and Thomas F. Conway, of Silver City.

TAOS COUNTY.

WASHINGTON.—It is stated that a one-tenth interest in this mine in the Cochiti district was sold last week by H. C. Leeds to J. A. Johnson and M. P. Stamm for \$5,000 cash. Mr. Johnson was already interested in the mine that is causing so much litigation.

OHIO.

HANCOCK COUNTY.

NEW OIL WELL.—Great excitement in oil circles has been created by the drilling in of an oil well on the Marion Cobb farm, in Marion township, seven miles east of Findlay. The well is owned by Thomas C. Kelley, and is flowing at the rate of 1,000 bbls. a day. It is the biggest oil strike in this section in a year.

PENNSYLVANIA.

ANTHRACITE COAL.

BELL'S TUNNEL.—Without any warning a portion of the mining hamlet of Bell's Tunnel, a few miles from Shamokin, began to sink last week. It is claimed by mining men that as soon as the ground thaws the entire village, which consists of 90 dwellings, will sink, and nothing can be done to prevent the catastrophe. The sinking of this tunnel is caused by robbing the pillars in the mine, which underlies the village. Nearly all the families have moved out of their homes.

BUCK MOUNTAIN.—A press despatch from Hazleton states that a very large bed of coal was struck at old Buck Mountain Colliery. This is the tract which Eckley B. Coxe leased before his death, and the discovery fulfills predictions which he then made. The colliery has been abandoned for many years, the former operator believing that the beds had been exhausted. The mine was originally operated by the Buck Mountain Coal Company. Shortly before his death Eckley B. Coxe became convinced that the property was still valuable and that coal enough remained to warrant sinking a shaft. During the past year the plans projected by him have been carried out, and an electric railway to carry the coal from this point to Eckley breaker, a mile distant, was put into operation. A short time ago a tunnel was completed, giving the mine natural drainage. Since then men have been at work hunting for the seam which Mr. Coxe felt certain existed.

HANOVER COAL COMPANY.—Judge Darté at Wilkes-Barre last week handed down an important decision in the estate of the late William R. Maffet. Mr. Maffet during his lifetime leased coal lands owned by him to the Hanover Coal Company, which under the decisions of the Supreme Court virtually amounted to a sale of all the coal embraced in the lease. On the death of Mr. Maffet his widow became entitled to one-third of the royalties. The lease was afterward forfeited by the executor, and the widow demanded a deed from the executor for an equal undivided interest in the new lease and all the coal embraced therein. Judge Darté has ordered that the said executor assign by proper deeds to Anna M. Maffet, widow of the decedent, the equal undivided one-third part of or interest in and to the two coal leases last above referred to, viz., the one of 12th of March, 1875, to the Lehigh & Wilkes-Barre Coal Company and the other of 7th of December, 1895, to Isaac B. Felts and others, with the absolute right to receive one-third the rents or royalties accruing thereon.

BITUMINOUS COAL.

BERWIND-WHITE COAL MINING COMPANY.—A terrible explosion of gas occurred at this company's shaft just east of Dubois on March 23d that killed 13 men. The shaft is about 300 ft. deep, and for some time it has been known that there were traces of gas in the chambers, but precautionary steps were taken and the mine was regarded as safe. The mine is in an early stage of development, otherwise there would have been more men at work at the time of the explosion.

CLEARFIELD, BEECH CREEK, CAMBRIA AND GALLITZIN.—Last Monday the following notice was posted on all the mines in these coal regions: On and after April 1st, miners will be paid 45c. per 2,240 lbs. for mining. Day labor will be paid the same rates as when this price for mining formerly prevailed. The notice means an advance to the miners of 5c. a ton, or 12½% over the wages that have prevailed in the regions named for the past two years.

SOUTH DAKOTA.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

F. G.—A one-third interest in the F. G. group was sold last week by the locator, Captain Griffin, to Rodney O. R. Russell, of Roche, Cornwall, England. The property consists of claims, and the price stated is \$10,000, the purchaser having an option to take the remaining two-thirds within six months. Enough development work has been done to show the existence of a large body of free milling ore.

J. R.—The work of exploration upon this property is now well under way. A claim adjoining the J. R. is under bond to the owners, and a vertical shaft is being sunk 200 ft. with a view to opening the ledge exposed in the old incline further up the hill. On reaching the 200-ft. level the ground will be thoroughly explored for the purpose of finding the lost pay chute.

QUEEN BEE DISTRICT.—The region about the old Queen Bee mill, in Northern Pennington County, after years of silence and practical abandonment is again attracting attention. The find made by a prospector of granulated quartz carrying uniform values of from \$50 to \$60 per ton in free gold, on the Locomotive Claim, led to active prospecting and the discovery of several valuable ledges. A 200-ft. shaft is being sunk by W. O. Temple, of Rapid City. Upon the Patrick Henry lode a large body of decomposed vein matter, averaging about \$5 per ton.

STORM MOUNTAIN.—Theodore Heder is sinking a 100 ft. shaft upon this property, owned by James Jacoby and others, for a one-half interest. The claim is near the Tip Top on Spring Creek, where the discovery of a reef of quartzite carrying good gold values, created quite an excitement last Fall. The find was made by a man named Reynolds, inexperience in prospecting in a formation which no one supposed could carry gold. The region is staked for miles in all directions.

SUNNYSIDE.—A carload of the ore taken out in sinking the 60-ft. incline was shipped to the Kansas City smelter, that the full values of the quartz might be determined. The ore remaining upon the dump after this shipment, some 24 tons, was hauled last week to the J. R. custom mill, where a test run was completed on March 20th, the clean up returning 57 oz. of gold, estimated to be worth \$18 per oz., or, approximately, \$42.75 per ton. The expense of opening this ledge is more than paid, leaving the smelting returns as profit. The quartz is uniform in value. The vein averages about 2 ft. and the ledge is clearly traced for over 200 ft.

TEA HOPE.—It seems probable from late advices that the bond upon these properties to Chicago parties which matures soon, will be taken up. John Ryan, formerly a well known Black Hills mining man, came on from California to report upon the property, and his report is said to have been very favorable. At the date of the examination the Dolcode, one of the included claims, showed at 75 feet a ledge three feet wide well defined, composed of quartz, carrying free gold. Dolcode at the surface was a mere rich seam. It has widened and preserved its unusual values throughout development to its present depth.

TOURNEY PROPERTY.—This mere prospect, located 2½ miles east of Pactola, was relocated last fall by John Tourney. The showing from pan tests in the limited workings was so good that Kansas City parties have bonded the ground. The vein, a strong one, is a contact fissure between porphyritic schist and trachyte.

UTAH.

TOOELE COUNTY.

LUCKY BOY.—This group of mines, located east of the East Golden Gate Mining Company's property at Mercur, was sold last week to Chicago capitalists for \$7,500. Developments will begin on the group at once.

MERCUR GOLD MINING AND MILLING COMPANY.—This company is still figuring on its new mill, and Manager Dern states that work on it would probably begin in May. The new mill is to have a crushing capacity of from 400 to 500 tons daily, but at the beginning the tank capacity will be about 200 tons, and the increase to the full capacity of the crusher will depend largely upon what disposition is made of the present mill.

VIRGINIA.

WYTHE COUNTY.

BERTHA MINERAL COMPANY.—The dressing house of this company, at Bertha, was entirely destroyed by fire on March 14th. The loss is said to be about \$50,000, partially covered by insurance. The fire originated in the bag room of the oxide plant, which was attached to the dressing house.

WEST VIRGINIA.

MARION COUNTY.

FAIRMONT GAS COAL COMPANY.—Edwin Einstein, of New York, has been appointed receiver for this company, of Fairmont by Justice McLean, of the Supreme Court, who has also granted an order dissolving the corporation. The referee, Hammond Odell, reported that all the assets were in West Virginia, consisting of lands at Fairmont, the market value of which is \$2,500, and \$40 in cash. The company ceased mining in 1872, all the coal of any value that could be reached having been mined out, and the plant is in a ruined condition.

TYLER COUNTY.

DEVONIAN OIL COMPANY.—The result of the big strike by this company on the Lloyd Weekly Farm, some 500 or 600 ft. southwest from the same company's big well, on the Kyle farm, was looked forward to with great interest by the trade and certainly was one of the most important wells completed in the entire region for some time. The well started off at a 150 bbl. per hour gait, but has subsided to about 30 bbls. an hour. There are several other wells nearing the sand in this locality, the result of which is anxiously awaited. They are overdue, but drawbacks of one kind or another have delayed their completion.

SHAY AND McMULLIN'S No. 1.—This well on the Dan Weekly farm, located a little over 500 ft. almost directly east of the Devonian Oil Company's No. 1, on the Kyle Farm, was drilled into the pay sand last week, and is reported to be making in the neighborhood of 60 bbls. an hour. This well has been watched closely and is considered important, as it will help in defining the new field.

WYOMING.

ALBANY COUNTY.

(From Our Special Correspondent.)

BLUE GRASS MINING DISTRICT.—This district is situated some 25 miles west of Wheatland, a town on the Union Pacific, Denver & Gulf Railroad, 60 miles northwest of Cheyenne. Active work has been going on in this district for some time, but the matter has been kept very quiet. The ore bodies are from 10 to 12 ft. wide, with granite walls, and

increase in value with depth. Gold and copper are the principal minerals in this district. A large amount of ground has been taken up for placers, and when the season opens there will be great activity along this line.

SPRING CREEK.—Messrs. Story, Wolcott & Co., owners of the Spring Creek Placers in the Douglas district, have given a short time bond on the property to an Eastern syndicate. Consideration, \$30,000.

CARBON COUNTY.

(From Our Special Correspondent.)

ALBION.—A good strike is reported to have been made in this mine on March 13th. At a distance of 85 ft. in the tunnel, which follows the vein, it is said that a rich streak of free milling ore was encountered. The mine has been producing rich ore for some time, and about 60 tons are now stored in one of the cabins awaiting suitable roads for shipment.

WEST SIDE PLACER ASSOCIATION.—Several car loads of machinery for the West Side Placer Association have arrived in Rawlins, and are being transported by bull teams to the company's property on Dry Gulch in the Fourmile district.

FREMONT COUNTY.

(From Our Special Correspondent.)

BURR.—The owners of this mine, in the Lewiston district, are shipping out a carload of ore to be treated by the cyanide process. If satisfactory results are obtained, a cyanide plant will be erected on the property at once. The success of the cyanide process in the treatment of the tailings in that district last season has brought about a revival in the development of the various quartz properties in the entire section and a number of these plants will be erected the coming season.

EMIL GRANIER.—Frank Hinman, manager of the Emil Granier placer property, now owned by the Rock Springs Placer Company, near Atlantic City, has completed all arrangements, and will commence active operations about April 1st. This is considered one of the richest placer deposits in the State.

LARAMIE COUNTY.

(From Our Special Correspondent.)

TABLE MOUNTAIN MINING DISTRICT.—Every day witnesses the arrival of new prospectors and mining experts from all portions of the country, especially from Colorado and Montana. At present the greatest activity is at Granite, a point on the Union Pacific Railroad some 20 miles west of Cheyenne, at Stanton seven miles north of Buford, and at Table Mountain, 25 miles northwest of Cheyenne. The Iron Chief, situated at Table Mountain, shows a well defined ore body of quartz, heavily impregnated with a red and brown hematite of iron on the surface. At a depth of 20 ft. the vein is 2 ft. wide and the formation is changing to a carbonate and runs from \$10 to \$20 gold per ton. The Silver King has an ore body 60 ft. wide between trachyte and lime. At a depth of 16 ft. rich stringers are coming in that assay \$4 gold and 26% copper per ton. The Philadelphia lode, owned by the Success Mining and Development Company, of Cheyenne, situated at Stanton, is a large body of quartz heavily impregnated with iron. The vein is about 10 ft. wide between granite walls. Average samples of the ore across the vein give by fire assay \$18.50 per ton gold. All the ore bodies at Stanton are true fissure veins in granite formation, and from 10 to 50 ft. wide running parallel to each other and have been traced for a distance of 15 miles on the surface. The ore bodies at Granite lie between granite and lime. Mill runs made on the ore at a depth of 10 ft. give \$28 per ton gold. Several parties from Cripple Creek have purchased properties at this point and are busily engaged in sinking shafts and making arrangements for permanent work. The Union Pacific, Denver & Gulf Railroad passes within five miles of Table Mountain. The management is putting in a station at the most accessible point, and arrangements are being made to put on a hack line April 1st. A hack line is also to be put on between Buford and Stanton.

FOREIGN MINING NEWS.

CANADA.

BRITISH COLUMBIA.

CENTRE STAR.—Two boxes of giant powder exploded in this mine on March 14th. Four men were killed and two fatally injured. The men were thawing out the powder in a hot-water tank in a crosscut about 70 ft. from the mouth of the tunnel. The cause of the accident is unknown.

NOVA SCOTIA.

CAPE BRETON COPPER COMPANY, LIMITED.—The stockholders meet in Boston, March 28th, to consider and vote on a proposition submitted by the board of directors to increase the capital stock from \$1,000,000 to \$2,000,000. The additional stock is to be used in extending the operations of the company.

MEXICO.

SONORA.

XAVAROS SILVER MINES.—It is said that arrangements are being made to explore the silver veins in the mountains near Xavaros, where a very promising discovery was reported nearly two years ago.

SOUTH AFRICA.

TRANSVAAL.

WITWATERSRAND GOLD PRODUCTION.—The output of the Witwatersrand mines in February was 187,018 oz. gold, showing an increase of 18,840 oz. over January, but a decrease of 2,277 oz. from February, 1895. For the two months to February 29th the report shows 315,196 oz. gold, against 346,758 oz. for the corresponding period in 1895, and 301,684 oz. in 1894.

LATE NEWS.

All hope of saving the 60 miners who were entombed in a mine at Brunnerston, near Wellington, New Zealand, on the 28th inst., by an explosion of fire-damp, which killed five men outright, has been abandoned.

From Madagascar under date of March 27th.—Under instructions received from France, mine prospecting permits issued lately have been cancelled, and such permits hereafter will be granted to French citizens only.

The Southwest Oil and Gas Company has been organized in New York, its present capital stock being \$250,000, with the right to increase hereafter. The main office of the company will be in New York, with a branch in Pittsburg, Pa., and it is stated that it has secured leases extending over 15,000 acres of land in Pennsylvania and West Virginia, which are to be explored for oil and natural gas. The leases are on the belt extending through Southwest Pennsylvania and into West Virginia.

At the March meeting of the Western Foundrymen's Association in Chicago, the following resolutions were adopted:

"WHEREAS, This association has been requested by the Foundrymen's Association of Philadelphia to join in a call for the first national convention of foundrymen, to be held in Philadelphia, May 12th, 13th and 14th, 1896; therefore be it

Resolved, That in view of the fact that the Western Foundrymen's Association has no control of the arrangements for this national convention, it is the sense of this association that the joining in this call should be confined to members of the association only as individuals; and

Resolved, That the Western Foundrymen's Association request its members to attend the convention; and

Resolved, That the secretary be requested to send the names of those individual members who desire to sign the call for the convention to Mr. Evans, secretary of the Foundrymen's Association of Philadelphia."

There was a long and interesting discussion on the question of the best system of apprenticeship to the trade.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 27.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending March 21st, 1896, compared with the corresponding period last year.

	1896.		1895.
	Week.	Year.	Year.
Pennsylvania Railroad.....	71,589	789,950	843,855

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending March 21st, and for years from January 1st, 1896 and 1895:

	1896.		1895.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	45,865	546,658	443,778
Barclay, Pa.....			
Beech Creek, Pa.....	74,971	786,161	655,247
Broad Top, Pa.....	11,614	112,331	121,279
Clearfield, Pa.....	103,839	1,134,288	1,008,569
Cumberland, Md.....			635,485
Kanawha, W. Va.....	161,026	864,225	848,149
Phila. & Erie.....	1,025	12,367	30,386
Pocahontas Flat Top.....	180,659	744,079	733,363
Totals.....	381,999	4,200,022	4,472,256

† Week ending March 14th.
‡ " " " " " " March 7th.

	1896.		1895.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	21,026	221,595	206,053
Pittsburg, Pa.....	37,120	456,154	487,824
Westmoreland, Pa.....	37,985	452,950	566,663
Totals.....	96,131	1,129,799	1,260,540
Grand totals.....	478,130	5,329,821	5,732,796

Production of coke on line of Pennsylvania Railroad for the week ending March 21st, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 88,908 tons; year, 1,034,781; to corresponding date in 1895, 1,358,313 tons.

Anthracite.

So far as actual market conditions are concerned there is no change to report of the anthracite coal trade. New business is still light and deliveries on old orders are still being made. A prominent buyer assures us that deliveries on an order which he placed during the first week in February will not be completed until sometime in May. Buying has not been active, the movement of coal has been sufficient to absorb the production and although statistics are not published it is certain that the restriction of the output has been adhered to as stocks in the hands of producers are, almost without exception, much

lighter than they were at this time last year. Prices have continued steady. There are some individual operators who make "concessions" in prices amounting to 10 or 20c. per ton, but the companies are maintaining the "circular," which remains \$3.60 for stove, \$3.35 for egg and chestnut and \$3.10 for broken, all net on board.

Some excitement was created during the week by the publication in a daily newspaper of an interview with a "prominent coal man" in the course of which it was stated that the "combination was broken." The facts in the case are that there is no change in the *entente cordiale* which has existed in the coal trade for the past two months. There has at no time been any illegal "combination" so there is none to be "broken." At the time the percentage question was settled it will be remembered that a committee was appointed to draw up some plan or form of agreement for the conduct of the companies. Such violent opposition developed in the press and in the legislatures of New York and New Jersey that the officers of the companies decided to take no further action. It was for this reason that the monthly meetings of the sales agents was somewhat ostentatiously abandoned and it was asserted that no especial restriction was even recommended. One of the members of the committee on organization above referred to stated to our representative that the committee was doing nothing and did not even report progress, because the actions of the companies had been so misrepresented that it was judged best to go no further. All the companies are desirous of avoiding a repetition of the events of 1895 and are conducting their business with that experience before them. Incidentally, they have come to the conclusion that it is better not to speak "for publication."

With this in view, it is intimated that no more meetings of the sales agents will be held, and that each interest will henceforth mine as much or as little as it deems best. At the same time, and as the result of "informal" talks, it is the opinion of the sales agents that the market will take about 3,000,000 tons during April, and the output will be restricted accordingly.

NOTES OF THE WEEK.

The statement of the Philadelphia & Reading Coal and Iron Company is as follows for February, and the three months of the fiscal year from December 1st to February 29th:

	February.	Three mos.
Gross earnings.....	\$1,504,340	\$5,574,150
Expenses.....	1,705,389	5,835,278
Loss from mining.....	\$201,049	\$261,128
Fixed charges.....	95,000	285,000
Deficit.....	\$296,049	\$546,128

Expenses for the three months include colliery improvements amounting to \$222,599 in all.

Bituminous.

The soft coal trade this week is extremely active and ore producers generally are not quite able to supply the demand. This condition is probably due to the advance in prices announced to take effect on April 1st. All consumers are desirous of securing an additional cargo or two at the lower figures prevailing now, and sellers have had to refuse some orders calling for delivery before the first of next month. After that date it is more than likely that the market will be dull for some days, though all producers are now striving to secure contracts at the "combination" rates. It will require some time for buyers to assure themselves that the higher prices are really going to rule. For some years past buyers have been accustomed to lower figures at the beginning of each contract season and this year the reverse will happen as an advance of at least 15 or 20c. is ordered. It was, of course, only a matter of time when rock bottom should be reached. According to the interests composing the association the bottom was reached last year and an upward reaction was to have been expected. After all, the advance will not net the producing companies much more than last year's schedule, for not only have the railroads advanced their through rates, but also the miners in all the regions have had their wages raised 5c. per ton, and other labor has been advanced proportionately to take effect on April 1st. We are assured that the difficulties with certain interests to which we referred in our last issue have now been adjusted, and the association is on a stronger basis than ever. It is expected that contracting at the new rates will begin early in April, and will continue until summer.

Transportation from mines to tide is extremely slow, and it is felt more keenly than usual just now when everybody is putting forth every effort to get coal shipped before the 1st. Most producers have large quantities of coal on the way and large numbers of vessels awaiting it, so that it is shipped promptly on arrival. Transportation superintendents will spend some unhappy hours and hear some unpleasant remarks from now until the 1st. The car supply is short, which, after all, is natural, considering the large tonnages now delayed on the way. Some of the producers do not hesitate to say that the shortage of "empties" is a plot on the part of the railroads to delay the coal long enough to enable them to get the advanced rate next week.

In the vessel market sailing craft and barges for around the Cape are extremely scarce with rates advancing on account of the demand. The advance is already great enough to offset the coming railroad

rate increase and has caused coal to be sent to New York harbor shipping ports for shipment in Sound and New York harbor barges, on which no advance in rates has taken place yet. At the lower shipping ports vessels are very difficult to charter and light draught ones are not to be had at all. We quote rates as follows from Philadelphia: To Boston, Salem, Portland, Portsmouth, Wareham and Bath, 90c.; Providence, New Haven, New Bedford, Bridgeport and other Sound ports, 80c.; Lynn and Newburyport, \$1.

Buffalo, N. Y. March 26.

(From Our Special Correspondent.)

The anthracite coal trade is dull for local, near by, Western and Canadian towns and villages. No orders excepting for the immediate requirements of consumers may be expected until the spring quotations are made known.

Bituminous coal is a shade more active as some consumers are buying in anticipation of the advance in prices to be made April 1st. Manufacturers are busy as a rule. Stocks of coal ample for all requirements.

The heavy snow storm, which continued for over 20 hours the end of last week, hindered travel and transportation by railroads at this end of the State.

There is a strong movement looking to the establishment of a United States Department of Commerce, as suggested by the National Association of Manufacturers. The idea has been indorsed by the National Board of Trade and many commercial bodies who have passed resolutions urging Congress to establish this department.

It is very evident that the Pennsylvania Coal Company intend selling their five acres of land in Buffalo, with the trestles and coal pockets thereon. The land is very valuable, having railroad and canal frontages of 1,500 feet each; also a mile or more of railroad tracks. Mr. Selleck, their coal agent, here, says: "The company has been doing business for 25 years at this port but for the last 10 years the coal shipping business of the lakes has steadily grown worse. The competition of the railroads is so fierce and their equipment has been increased and bettered to such an extent, that the future of the lake trade is not good. Last year we sent no coal to Milwaukee and but little to Chicago. A small fortune has to be paid out each year in taxes, etc. The idea is to sell the whole thing in a lump."

The outlook for an early opening of navigation continues unpromising; but vesselmen and shippers are not worried at all over the matter; as a rule a late opening insures higher rates of freight and a steadier demand for vessels.

Chicago. March 25.

(From Our Special Correspondent.)

The anthracite coal trade for this vicinity during the past week has not been to anybody's liking, and consequently dealers are more aware than ever that the present inactive state of the market means little profit to anyone. There are a great many coal dealers in Chicago, and the fight for the limited amount of business transacted during the past winter has been severe. Combined with the small tonnage of coal placed must be taken also into consideration the prices obtained.

It is a matter of doubt whether anthracite coal sold during an entire winter ever before at the low price obtained during the past five months. Stocks of anthracite coal held by dealers are not over large, and it is not probable that any active effort will be made to fill up until some activity springs up. It is not thought that the price on hard coal will advance any by May 1st, and that is the date from which summer prices are fixed.

Bituminous coal has been in somewhat better demand, but not enough to show any marked improvement in the market. Some of the larger manufacturing concerns have bought more freely, but on the whole trade is depressing. Prices are uncertain.

Pittsburg. March 26.

(From Our Special Correspondent.)

The Coal Trade.—The market since our last has been an active one. A further rise in the rivers was followed by heavy coal shipments to the Southern and Western markets, consisting of 170 boats, 119 barges, containing 7,500,000 bu.; this will be followed by others. Business in the harbor was very active; between the boats arriving with empties and the boats leaving with tows for the lower ports there was plenty of excitement along the wharf. The empties were forwarded to the pools and will be loaded in time for the fleet that is now coming up to return with another tow. The railroad coal trade is still occupied with the uniformity question, which will most likely be satisfactorily arranged. Operators are awaiting the opening of lake navigation, when they expect to do even a larger business than last year, although they must concede 40% of the lake trade to the Ohio operators against 37% last year. The expected increase in Northwestern business will give them more than 4,000,000 tons, the amount sold last year.

From the miners' standpoint the situation appears brighter than for many months past. At Phillipsburg, Pa., the following notice has been posted on the tipples: On and after April 1st the employees of this company will be paid 45c. per 2,240 lbs. for mining. Day laborers will be paid the same rates as when that price for mining formerly prevailed.

The Hays coal plant on the Monongahela resumed on Monday after being closed a long time pending a settlement.

The 70c. rate in the Pittsburg district secures the Ohio miners an advance of 6c. per ton, which will be paid by all the operators.

Connellsville Coke.—The shipments of coke from the region which have been fluctuating for several weeks dropped off again last week. The furnacemen have been making a stiff fight for a reduction below the \$2 rate, but the coke operators have been just as firm in refusing. Those in a position to know say that a better condition of the iron trade is expected after April 1st and that the demand will increase sufficiently to justify firing additional ovens. A summary of the week shows 12,198 ovens in blast and 5,750 idle; estimated production of 115,258 tons; week's decrease 2,228 tons. The H. C. Frick Coke Company has blown out 40 ovens at the Wynn plant. The Pennsville plant blew out eight ovens. In the running order 4,579 ovens made six days, 6,005 ovens five days and 1,614 ovens made four days. The coke shipments from the region amounted to 6,724 cars; week's decrease, 21 cars. The shipments were as follows: To Pittsburg, 1,977 cars; to points East, 1,063 cars; to points West, 3,679 cars. Prices are fairly maintained. Furnace coke, \$2; foundry \$2.30; crushed, \$2.31 f. o. b. cars at ovens.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 27, 1896.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	March 25, 1895.	March 27, 1896.	Jan., '95	Jan., '96.	Tons.	Tons.
Anthracite.	31	20,005	51	33,270	271,197	437,348
Coke.	121	131,611	137	162,676	1,797,313	2,116,929
Charcoal.	17	3,765	19	5,360	57,329	61,840
Totals	172	155,381	207	201,306	2,125,839	2,618,217

The iron market is to day in a doubtful and hesitating condition. The main question just now is whether the present condition of uncertainty will pass away and demand increase as the spring opens, or whether we are to drag along until the fall elections are over. The most encouraging point in the prospect of an early adjournment of Congress. No one now expects any action on the currency question from that body, and when the session is closed there will be at least a period of quiet and the certainty that business will not be disturbed by any more senseless war talk. The doubtful point is in the action of the conventions of the two political parties, and the possibility that the issues really important to business may be evaded and an effort made to put them aside for others which no one really wants to stir up or discuss over again.

The important news of the week is the result of Cleveland conference of ore-men, which came to a close last Saturday, when it was announced that prices had been fixed at \$4 per ton for standard Bessemer—high grade Norrie—at Lake Erie ports, \$3.35@3.75 for iron Mountain or Mesabi ores. This is an advance of \$1.10 over last year. The conference further decided to reduce the allotment heretofore made for the season by 2,000,000 tons, in view of the probable lighter demand. The last matter is of minor importance, however, for nobody believes that the limit, which is now about 8,000,000 tons, will be adhered to should the demand for ore be good. There is a general impression that prices will be maintained, and the effect has been to prevent any further shading on pig iron. With \$4 ore and \$2 coke the Western furnacemen claim that Bessemer pig cannot be sold much below \$13 per ton, Pittsburg. Foundry grades can be placed at present quotations with some profit, but there will not be room for much reduction in price. An opportunity will be given to place Southern iron in the tidewater markets, which will not be neglected.

The much-talked-of foreign order for rails turns out to be 10,000 tons for Japan, and it has been taken by the Carnegie Company. The price, of course, is not stated, but it must have been low enough to meet the bids of the English and Belgian makers. Rail orders here continue very light, and, while it is well to build up an export trade, it might be well also for the rail-makers to consider whether a reduction in the present high price would not encourage home orders. The maintenance of the \$28 quotation in the face of the reduction in almost all other iron and steel products does not seem to us to show good judgment.

A good deal has been said in the daily papers about shipments of Alabama pig iron to England. Inquiry shows that the only shipment made has been on a trial order for 1,000 tons from Glasgow, which was filled from the Sloss furnaces.

One of the curious cross-currents of trade has been shown this week in the purchase of a lot of cotton ties from a Youngstown mill for shipment to Bombay, India. This is intended, perhaps, to test the possibility of opening a new trade—and perhaps to hint to English makers that it is possible to retaliate for the low prices at which they have been placing ties in our cotton ports.

The failure of the Glendon Iron Company has not had an encouraging effect, though it was not un-

expected among those who are well posted. The company's affairs can probably be adjusted without loss.

NOTES OF THE WEEK.

Representatives of a number of the makers of soft steel are now holding a conference in New York, with a view to the adoption of some agreement to adjust and maintain prices. The success of the conference seems to depend on the action of two or three of the large Western mills, which are not represented.

The report of the Tennessee Coal, Iron and Railway Company covers 11 months, the fiscal year having been changed to end with December 31st, instead of January 30th. The report shows that the undivided profit brought forward from 1894 was \$902,511. Out of this amount, \$729,413 has been employed in writing down the value of assets as depreciation, leaving \$173,098 to carry forward to 1895. The net earnings of 11 months of 1895 amount to \$995,793. These earnings and balance amount to \$1,168,891, from which there has been paid out for interest during the fiscal year \$375,535, and charged to profit and loss account, \$206,770 to represent accrued interest on the bonded debt not yet due. After charging also bad debts with \$21,280, and loss on the sale of treasury bonds \$22,241, there remains a balance of undivided profits to be carried forward of \$543,064. The bonded debt of the company is \$9,132,716, having been reduced \$252,584. The floating debt has been increased by \$205,094, while the surplus of free assets over unfunded liabilities increased \$316,624. The fixed charges are now \$47,884 per month.

New York. March 27.

The local market has been rather a waiting than a specially active one, though some transactions of considerable size are reported. The cold and stormy weather has rather delayed the beginning of building operations, and thus affected the market for structural iron and steel, which, however, still promises to be the most active section for sometime to come. No new large buildings are noted this week, but the amount of work already in hand is very large, and more is promised. There is also a great deal of building begun or arranged for on the upper West Side of the city, say from 100th to 125th streets and from Columbus avenue to the Riverside Drive, and while most of the new buildings in this section are five-story apartment houses, the quantity of iron used in this class of work is continually increasing, as we have already noted, and in the aggregate a very considerable quantity of iron and steel will be used this season. The large buildings to go up on the West Side this year are some of the new Columbia College building, the new wing of St. Luke's Hospital, the new wing of the Museum of Natural History, and, further up, the New York University.

The placing of contracts for the material for the new electric lines north of the Harlem River has been delayed by litigation over the franchises, but a good deal of work may be expected during the summer.

Pig Iron.—There have been some heavy sales, chiefly to the pipe foundries. Some of them, which have secured good contracts, are putting in heavy stocks of which Southern iron forms an important part. The pressure to sell by Southern furnaces continues, and has resulted in some shading of prices. A conference of Southern furnacemen has been held this week; but the result has not been made public. We must report most Southern brands from 25 to 50c. a ton lower, with a consequent shading on all Northern brands except a few old favorites.

We quote for Northern brands as follows: No. 1 foundry, \$13@13.25; No. 2, foundry, \$12.25@12.50; grade forge, \$11.50@11.75. For Southern iron prices are: No. 1 foundry, \$11.75@12.25; No. 2 foundry, \$11.25@11.75; No. 1 soft, \$11.50@12; No. 2 soft, \$10.75@11.25; grade, \$10@10.50. All prices are for tidewater delivery.

Cast Iron Pipe.—No new contracts are reported this week, but there is plenty of inquiry and a number of small contracts to place.

Spiegeleisen and Ferro-Manganese.—No business is noted, and quotations are unchanged and nominal at \$19@20 per ton for spiegeleisen and \$47@47.50 for ferro.

Steel Billets and Rods.—Little business is noted, and no change in prices. Billets can be had at \$19.50 @ \$20, tidewater delivery. Rods are quoted about \$25.75@26, tidewater delivery.

Merchant Iron and Steel.—Business has not been active, and small orders are less plentiful. Bars are somewhat demoralized and the prices have been cut. We quote for common bars, 1.15@1.25c; refined bars, 1.25@1.50c; soft steel bars, 1.25@1.35c. Other quotations are as follows: Open hearth machinery steel, 1.50@1.60c.; steel hoops, 1.50@1.60c.; steel axles, 1.65@1.80c.; links and pins, 1.65@1.80c.; tire steel, 1.85@2c.; spring steel, 2.10@2.25c. Rivets are 2.20@2.30c. for steel, and 3@3.30c. for iron.

Plates.—Business is quiet and prices about the same. Universal millplates are 1.45@1.55c. For steel plates we quote: Tank, 1.45@1.55c.; boiler shell, 1.55@1.65c.; good flange, 1.80@1.95c.; firebox, 2.10@2.50c. Charcoal iron plates are 2.20@2.30c. for shell, 2.70@2.80c. for flange, and 3.20@3.30c. for firebox. Some of these quotations can be shaded on good orders.

Structural Iron and Steel.—This has been rather an off week, for reasons noted above,

In prices there is no change. We quote for angles, 1.45@1.55c.; channels, 1.60@1.75c.; tees, 1.65@1.75c.; beams (up to 15-in.), 1.65@1.75c. for large lots and 1.90@2.10c. for small orders.

Steel Rails and Rail Fastenings.—Rails are unchanged at \$28 per ton at mill, or \$28.75 at tide-water for standard sections. Girder and street rails are \$28@32 per ton at mill, according to section. No new business is noted.

Rail fastenings are not in much demand, and some pressure to sell is noted, which may lead to reductions. Quotations are: For fish and angle-plates, 1.25@1.35c.; spikes, 1.65@1.80c.; bolts, 1.95@2.05c. for square nuts, and 2.05@2.15c. for hexagon nuts.

Scrap Iron.—Demand is lighter, but there is not much good foundry scrap offering. We quote \$9@ \$11 per ton, according to size and quality of lots. A good sized lot is reported placed at \$10.50, delivered at New Haven.

Buffalo.

March 25.

(Special Report of Rogers, Brown & Co.)

Except for a little spurt in sales of Southern iron the local market has been uneventful. These transactions have been effected by making close prices, and we shade down the quotations of last week to correspond more closely with actual sales of this class of iron. As the season advances the consumption of pig iron in this section seems to increase and there exists a general impression that the value will be good whether prices are as satisfactory or not. We quote on cash basis f. o. b. cars Buffalo, as follows: No. 1 foundry strong coke iron, Lake Superior ore, \$13.50; No. 2 foundry strong coke iron, Lake Superior ore, \$13; Ohio strong softener, No. 1, \$13.70; Ohio strong softener No. 2, \$13.20; Jackson County silvery No. 1, \$15.25@15.75; Southern soft, No. 1, \$12.50; Southern soft No. 2, \$11.90. Hanging Rock charcoal, \$18; Lake Superior charcoal, \$14@14.50.

Chicago.

March 25.

(From our Special Correspondent.)

There has been no change of importance in the condition of the iron and steel market at this center. The tendency appears to be for consumers to hold off until buying is an absolute necessity, and then it is done on a small scale as a usual thing. The pig iron market remains dull. Rails and billets have had but a small demand and structural material is slow. There is a tendency to better prices in some lines, but the market on the whole is unsteady. There are some indications of a more active buying, inquiries suggesting much business are coming in.

Pig Iron.—Probably 4,000 tons of pig iron were sold from this market during the past week. The majority of sales were for carload lots, the only large sale being one of 1,000 tons charcoal iron. Dealers are hoping that since ore prices are settled, and the furnaces will soon know just what prices will be for the Spring trade, buying will soon begin again more freely. There is no class of iron that is in special demand and no one industry is buying more actively than any other. Prices are fairly well maintained: Lake Superior charcoal, \$13.50@14; local coke foundry No. 1, \$12.50@13; local coke foundry No. 2, \$12@12.50; local coke foundry No. 3, \$11@12; local Scotch foundry No. 1, \$12.50@13; local Scotch foundry No. 2, \$12@12.50; local Scotch foundry No. 3, \$11@12; Southern coke No. 1, \$12.35@12.85; Southern coke No. 2, \$11.60@11.85; Southern coke No. 3, \$11.35@11.60; Southern No. 1, soft, \$11.60@11.85; Southern No. 2, soft, \$11.35@11.60; Southern silveries, No. 1, \$11.85@12.35; Southern silveries, No. 2, \$11.60@11.85; Jackson County silveries, \$14.50@16; Ohio silveries, No. 1, \$15@15.50; Ohio silveries, No. 2, \$14.50@15; Ohio strong softeners, \$15@15.50; Alabama car-wheel, \$16.85@17.35; malleable Bessemer, \$13; coke Bessemer, \$13@14.

Bar Iron.—Not much business has been booked by the mills from this center during the week. There are some inquiries for fairly large quantities but the buying is slow. Bar iron prices are: common iron, 1.35c. and refined 1.40@1.45c.

Structural Material.—There is some business in building and bridge shapes, but the market on the whole is rather dull. Three or four small bridges out of town are being figured on. Prices are not steady. Beams and channels, 1.65@1.70c. Plates, 1.60c.; angles, 1.55@1.60c.; tees, 1.70c.

Steel Rails.—A few thousand tons of rails have been sold for the week in small quantities. Rails are quoted \$29 and up according to specification.

Billets.—But few sales of billets have been made and the market for this material is very poor. The Illinois Steel Company, however, are not quoting on billets and that may have something to do with the present condition. Rods are in poor demand. Billet quotations are \$19@19.50 and rods \$26.

Old Rails and Wheels.—A sale of 250 tons of old wheels at \$13.50 is noted. Old rails are not sought for.

Cleveland, O.

March 26.

(From Our Special Correspondent.)

Iron Ore.—Official announcement has been made by the Ore Dealers' Association that during the season of 1896 the price of Bessemer iron ore would be based on \$4 for Norrie, which is regarded as a standard Bessemer. The price of Norrie last spring was fixed at \$2.90, so that the scale agreed upon is \$1.10 above last year. During the past six months, however, ores of the grade of Norrie have been selling for from \$4 to \$4.25 or better. As compared with these latter prices there is, therefore, no advance. The prices for the other ores have not yet been an-

nounced, and it is stated by ore men that the details have not been fully worked out. At any rate, there have been no sales of the new ore reported. It is said that there will probably not be any sales of consequence for two weeks or longer. At least, some of the shippers are not looking for them to materialize before that time.

Another statement which has been made by the ore men is that the estimated output of Bessemers for 1896 is now placed at 7,500,000 to 8,000,000 tons. The estimated production made several months ago was 9,500,000 tons. The outlook was then much brighter than now and ore was going forward from the Lake Erie docks more freely. This present estimate is for Bessemers only. Assuming that the figures are an approximate guess of what the year will yield in the Bessemers and the outlook is that the total production of Bessemers and non-Bessemers will exceed 11,000,000 tons, or more than last year. It was thought at this time last year that the Bessemers would be brought down to the extent of about 6,500,000 tons. The actual figures were 2,000,000 tons better. Requirements of the non-Bessemers are, perhaps, more a matter of uncertainty than of the steel-producing ores, for the former have keener competition to meet, the Southern irons making a good showing in sales in this territory recently. One particular in which the foundry irons from Lake ores are at a disadvantage is the high price of coke as compared with the coke prices in the South. The agreement as to prices does not cover the non-Bessemers and dealers are as yet considerably in the dark as to what the ores will bring this year. At present the better ores of this class are held at \$3.

The Lake situation is still dead. Ore men are not looking around for tonnage actively and perhaps will not until some sales are made. Ves-elmen say that they have practically been offered \$1 for season charters from the head of the lake, but that they will not accept an offer of this kind. They are asking \$1.10, or even better. Present indications are that navigation will not be open to Lake Superior before the last week of April. Sales of ore from Lake Erie docks this week are unimportant.

Pig Iron.—During the last day or two a firmer tone has been observed in the local market for Bessemer pig. It does not amount as yet to any very decided advance in prices nor to very large sales or inquiries. The strength is attributed to the announcement of the advance in ore prices. It is said that Bessemer pig cannot be produced and sold at Cleveland for \$12, the quotation of last week, if in its production the new ore at \$4 is used. From this low range there has been a recovery of about 50c, but trading is light.

There have been some considerable sales of gray forge irons during the past few days and the pipe foundries have been buying quite freely. The general outlook is much better than it was two weeks ago. Buyers have been covering a part of their wants at prices which they seem to be thinking are the bottom. Foundry irons are quiet with no change in values. Gray forge is quoted at \$10.75; Ohio Scotch, No. 1, at \$12.50, No. 2 at \$12; Northern strong at \$13 for No. 1, and \$12.50 for No. 2.

Pittsburg.

March 26.

(From Our Special Correspondent.)

Raw Iron and Steel.—Business during the week has developed no general improvement. Bank clearings and the tonnage and earning reports of the transportation companies show a larger business than that in progress a year ago, but there is much complaint of unsatisfactory conditions in many of the industries. More pronounced dullness has characterized the iron and steel trade and the general price position has continued weak. Production still exceeds consumptive requirements and stocks are accumulating; the uncertainty of the financial and business situation still holds the iron and steel trade in check. Consumers' wants are admitted to be large, but it seems so difficult to raise money that purchases are deferred until accommodations can be procured; in the meantime the unfilled orders on the books of the furnace and mill men are generally being wiped out, and prices are said to be cut by concerns that are short of business. That this policy is ruinous to all in the long run is obvious, for prices are not high; experience proves that when prices pass a certain point the consumption simply stops and the most profitable condition of the trade is when prices are just below that figure, but a reduction in prices from the present level would not stimulate consumption at all. Still it is impossible to deny that quotations for certain products are weakening, and if they decline much farther the coke men will have to recede from their \$2 price. Those consumers that bought sparingly are in need of supplies; the plant that purchased 20,000 tons within a short time made a very profitable investment, and the price of pig iron will not disturb it for some time to come. Bessemer and Mesabi ore have been advanced by the Cleveland ore syndicate, Bessemer to \$4 per ton; Mesabi to \$3.40 and \$3.75. These are the producers' figures; consumers will be heard from later. The market was firmer on the announcement, and in some instances a slight advance was obtained. Furnacemen have different opinions in regard to the advance in ores; they all agree that the advance puts a stop to cheap pig-iron for the present. So far we have learned of no sales of ore at the advanced prices.

Heavy sales of Southern pig iron are reported during the past ten days. The Tennessee Coal and Iron Company was among the largest sellers. Youngstown parties are said to have purchased 10,000 tons at a

Birmingham furnace on a basis of \$6.25 cash; the furnace refused to make further sales at that price.

COKE SMELTED, LAKE AND NATIVE ORE.		BLOOMS, BILLETS AND SLABS AT MILL.	
Tons.	Cash.	Tons.	Cash.
5,000	Bessemer, Apr., May, Pitts. \$11.85	3,000	Billets, Apr., May, at mill \$17.50
3,500	Gray Forge, Apr., May, June, Pitts. 11.00	2,000	Billets, Apr., May, at mill 17.75
3,500	Gray Forge, n xt 3 months, Pitts. 11.00	1,000	Billets, Apr., May, at mill 17.40
3,000	Bessemer, Apr., May, Pitts. 12.15	500	Billets, Apr., May, at mill 17.25
3,000	Gray Forge, Apr., May, June, Pitts. 11.00	SKELETON IRON.	
2,000	Gray Forge, Mar., Apr., Pitts. 10.95	1,000	Sheared, Pitts. \$1.45 4 m.
2,000	Bessemer, Apr., May, Pitts. 12.00	1,030	Wide grooved, Pitts. 1.30 4 m.
1,000	Bessemer, Mar., Apr., Pitts. 12.25	380	Narrow grooved, Pitts. 1.30 4 m.
500	Off Bessemer, prompt delivery, Pitts. 16.90	SKELETON STEEL.	
500	Gray Forge, spot, Pitts. 11.00	650	Wide grooved, Pitts. \$1.15 4 m.
400	Off Bessemer, spot, Pitts. 11.50	600	Narrow grooved, Pitts. 1.15 4 m.
300	No. 1 Foundry, prompt delivery, Pitts. 13.50	400	Sheared, Pitts. 1.37 1/2 4 m.
330	No. 2 Foundry, prompt delivery, Pitts. 12.50	BLOOMS, BILLETS AND BAR ENDS.	
100	No. 3 Foundry, spot, Pitts. 11.75	500	Billet and bar ends, Pitts. \$13.00
100	Mill Iron, prompt delivery, Pitts. 11.00	SHEET BARS.	
CHARCOAL.		550	Delivered, Pitts. \$20.00
50	Cold Blast, Pitts. \$4.00	STEEL WIRE RODS.	
50	No. 2 Foundry, Pitts. 17.00	1,000	5-gage, delivered, Pitts. \$22.50
50	No. 1 Foundry, Pitts. 18.00	SPELTER.	
25	Cold Blast, Pitts. 24.00	50	Prime, Pitts. \$4.10
MUCK BAR.		FERRO-MANGANESE.	
600	Neutral, delivered, Apr., Pitts. \$20.75	50	80% Pitts. \$50.00

Philadelphia.

March 27.

(From our Special Correspondent.)

Pig Iron.—Now that the long strain is over, and gilt-edge prices for ore and coke have to be submitted to, we have drawn a long breath and are getting down to business. To-day and yesterday iron men's mail swelled considerably, but it may be next week before results will crop out. The point is, our people are waiting for business. The forge iron buyers are discouraged, the foundry buyers are less anxious as stocks are accumulating, and threatenings of concessions at Southern points are disturbing our calculations. The crude production is apparently ahead of the probable requirements, as far as we can see through the fog to-day. Therefore everybody is waiting. Enough promises have gone out by makers and agents as to prices to make consumers feel safe for a while, and as to the summer, it can take care of itself. No 1 is selling at \$13@ \$13.50; No. 2, \$12.50; forge, \$11@11.50; Bessemer, at furnace, \$13.

Steel Billets.—It now looks as if buyers will have to relinquish the hope of \$19 billets. There was a sale yesterday at \$19.60, but buyers will not act precipitately. They have stock, and if manufacturers drive production there will be, buyers think, a better price than the \$19.75 now quoted.

Merchant Bars.—When the car builders who have been holding orders just far enough from our cage to keep clear of our claws place their orders, some of the country mills now doing next to nothing will fill up. Agents who are posted say there is a good deal of car building iron wanted for the second quarter of the year. Common, 1.25 for iron, and 1.30 for steel.

Skelp.—The manufacturers are boldly holding up prices on paper, but there are signs of weakening on the market, growing out of an offer or two for a large lot. Asking price, 1.27 1/2, but it don't go.

Pipes and Tubes.—As to cast, there is quite a stir. As to wrought, we are told there is a good deal of talk but not much business. In tubes big concerns are making special quotations even on small jobs.

Merchant Steel.—Carriage and wagon steel and iron is active.

Sheet.—A better demand is reported at one or two works in a small way.

Plate.—Manufacturers have seen a good deal of work slip through their fingers by reason of competitive freight rate advantages. All mills have some work. There is much promised, but a good deal of it leaks out. Tank plates are 1.40; universals, 1.45; shell, 1.5; flange, 1.60@1.70; fire-box, 1.85@2.00.

Structural Material.—Small orders are dropping in. There is quite a rush in large buildings, more than for years. Philadelphia is getting out of her old dwelling-house offices into office buildings. A dozen or more are under contract. Angles are 1.40. Beams, small, 1.50; large, 1.80.

Steel Rails.—Manufacturers expect to close for some large lots of girder rails during April.

at factory. Blue vitriol, \$3.75@\$.41, according to size of order.

Brimstone.—We quote for shipments, best un-mixed seconds, \$15@15.25. Thirds are 50c. less. Spot or nearby is \$16 for seconds.

Fertilizing Chemicals.—This market has continued quiet on the whole, though the Southern demand has been fairly good. Quotations are without marked change from last week, and we quote as follows: Sulphate of ammonia, gas liquor, \$2.40@2.50; bone, \$2.30 @2.55. Dried blood, high grade, \$1.75@1.80; low grade, \$1.60@1.70 per unit. Azotine, \$1.80. Concentrated phosphate, (30% available phosphoric acid), 70@71 1/2c. per unit. Acid phosphate, 13% to 15%, av. P2O5, 57c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P2O5, 90@92c. per unit. Acidulated fish scrap, \$12, and dried scrap with few or no sales, nominally \$21 f. o. b. fish factory. Tankage, high grade, \$19@20; low grade, \$18@19. Bone tankage, \$21; ground bone, \$19@20. Bone meal, \$21 @22.50.

Sulphate of Potash: 90-95%, New York and Boston, \$1.90 1/2; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 48-53%, New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk, \$1.02; Southern ports, \$1.03 1/2.

Muriate of Potash.—New prices for muriate are: New York and Boston, 1.75c.; Philadelphia, Baltimore and Norfolk, 1.76 1/2c.; New Orleans, 1.78 1/2c., for 80@85% (basis of 80%), in lots 25 tons and upward.

Kainit.—Quotations for 1896 are as follows: New York, Boston, Philadelphia and Baltimore, \$8.55 per ton; Norfolk, \$8.90, and New Orleans, \$9.05 per ton, for 25 tons and upward. Sylvinit at the same ports is quoted at 36 1/2c., 37 1/2c. and 38c., respectively.

Nitrate of Soda.—Spot, \$1.70@1.75; future arrivals, \$1.72 1/2@1.75.

Liverpool. March 17.

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

Outside of deliveries on running contracts, there is little passing in heavy chemicals. Soda ash is in limited demand and quotations nominal, the spot range for tierces being about as follows: Leblanc ash, 48%, \$4@4 5/8 per ton; 58%, \$4 5/8@4 10/8 per ton; ammonia ash, 48%, \$3 2s. 6d.@3 10s. per ton; 58%, \$3 7s. 6d.@3 12s. 6d. per ton net cash; bags, 5s per ton less. Soda crystals inanimate at \$2 7s. 6d.@2 10s. per ton, less 5% for barrels, and 7s. less for bags. Caustic soda steady, but there is not much going on. We quote spot range, according to market, as follows: 60%, \$6 5/4.@6 10s. per ton; 70%, \$7 5s.@7 10s. per ton, net cash; 74%, \$8 5s.@8 10s. per ton; 76%, \$9 2s. 6d.@9 5s. per ton, net cash.

Bleaching powder neglected and prices nominal at about \$7 2s. 6d.@7 5s. per ton net cash for hard wood packages, according to export market. Chlorate of potash dull, at 4 1/2d.@4 3/4d. per lb., for any position. Bicarb. soda in fair request, at \$6 15s. per ton, less 2 1/2% for the finest quality in 1 cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia is rather slow at about \$8 12s. 6d.@8 15s. per ton, less 2 1/2% for good gray, and 24s. for 25% in double bags, f. o. b. here, according to quantity. Nitrate of soda is well maintained on spot, at \$8 5s.@8 7s. 6d. per ton, less 2 1/2% for double bags, f. o. b. here, according to quality and quantity. Carb. ammonia, lump, 3 1/4d. per lb.; powdered, 3 1/4d. per lb., less 2 1/2%.

Valparaiso, Chile. Feb. 15.

(Special Report of Jackson Brothers.)

Nitrate of Soda.—The Combination has not yet been formally signed, and, although some slight difficulties have cropped up meanwhile, everything points to a satisfactory settlement within a few days. Producers have shown some anxiety to dispose of their present stocks for guaranteed sailing previous to March 31st next, at comparatively lower prices than those asked for April and later deliveries, as thereby they avoided that said stocks formed part of their combination quota, and had it not been for the scarcity of suitable tonnage, transactions in prompt shipments would have been considerably larger; this demand for ready vessels has caused an improvement in freights, which have advanced 2s. 6d. per ton, and sellers have had to lower their limits for 95% from 5s. 3 1/2d. to 5s. 2 1/2d without being able to increase sales. For forward shipment holders are very firm, prices having risen fully 2d all round for 95% and, although paid in some instances, buyers are less disposed to do so at the close. We quote: 95% March sailing guaranteed at 5s. 2 1/2d.; April, 5s. 5d.; May-June, 5s. 7d.; July-August, 5s. 8d.; September-October, 5s. 9d., while the 96% class can be had at 5s. 6d. for March sailing, with no sellers for forward. The price of 5s. 2 1/2d. with 25s. all round freight stands in 7s. 1 1/2d. per cwt. net cost and freight without purchasing commission. Reported sales are 1,188,000 quintals.

The inquiry for ready vessels to load nitrate guaranteed sailing in March enhanced rates for this produce, several vessels being taken up at 22s. 6d., 23s. 9d. and 25s. successively. For forward loadings vessels are freely offered at 23s. 9d. for nitrate. The disposable tonnage on the coast is reduced considerably, amounting now to only 35,235 tons. We quote as follows: For nitrate to United Kingdom ports, 25s.; to United States, 23s. 9d. to Hampton Roads or order.

MINING STOCKS.

Complete quotations will be found on pages 318 and 319 of mining stocks listed and dealt in at:

- New York, Boston, Philadelphia, Baltimore, Pittsburgh, Denver, Colo., Aspen, Colo., Colorado Springs, Duluth, Minn., Helena, Mont., Salt Lake, Utah, San Francisco, St. Louis, Paris, France, Mexico, Shanghai, China, Valparaiso, Chile, London, England.

NEW YORK, Friday Evening, March 27.

No improvement in the mining stock market can be reported this week. There is always a certain amount of inquiry for mining securities, but the public obstinately refuses to grow enthusiastic over any particular stock, and the result is that nothing in the way of real activity is ever felt. The Consolidated Stock and Petroleum Exchange continues to do business in a more or less perfunctory manner, and does not seem to care to exert itself in order to revive public interest in this once popular form of speculation.

The New York Mining Exchange has not gone out of business. A new board of directors has been selected and also the following officers: H. A. Ammon, president; C. Vey Holman, vice-president; William Brandreth, treasurer. O. P. Pell continues as secretary. The latter reports that there is more inquiry for mining stocks, and also that the new board of directors will use every effort to conduct the business of the exchange as it should be conducted. So far as we are able to judge, the volume of business done this week at the new exchange can scarcely be said to justify the existence of the institution.

At the Consolidated Stock and Petroleum Exchange trading in general was also very quiet. The Comstocks were in very little request, and only the stereotyped sales are reported.

The Colorado shares were not so active as they have been. Of the Cripple Creek stocks Victor shows transactions of 900 shares at \$6.50@6.75. Mr. R. H. Reid, secretary of the Victor Gold Mining Company, has issued the following statement for February: Balance on February 1st, 1896, \$47,638; receipts from ore sales, \$36,163, and from insurance, \$236. The disbursements for the month were, Operating expenses, \$14,941; Dividend paid, \$20,000. This leaves a balance on March 1st, 1896, of \$49,156. The ore statement is as follows: Ore mined, 195 tons; ore from stalls, 1,180. The ore mined returned 474 oz. of silver, and 1,125 oz. of gold. The stull ore returned 1,137 oz. of gold. The average net value of the ore mined was \$132, and of the stull ore, \$8.66 per ton.

The Horn Silver Mining Company, of Utah, has decided to pass the regular quarterly dividend, which was to have been paid on March 30th, owing to the fact that it has not been earned. The policy of this company has been to keep its surplus above a certain figure in order to be prepared for any emergency. Although there is a comfortable surplus on hand now it was deemed prudent to pass this dividend.

Boston. March 26.

(From Our Special Correspondent.)

The feature of the market is dullness, and the week has been rather a slow one. Calumet & Hecla has been rather an exception to the market, advancing from \$305 to \$309 1/2; this stock frequently has spurts of its own, independent of the general market. Arnold declined from \$1 1/4 to \$1, and Atlantic from \$19 1/2 to \$17.

Boston & Montana had a break, from \$79 to \$73, with unusually large transactions in the stock, reaching nearly 7,000 shares to-day alone.

Butte & Boston has ceased to be active, hanging around \$1 1/2@1 1/4. The committee having in charge the reorganization state that no immediate steps will be taken; that the company's affairs will need thorough overhauling meantime.

Franklin, in sympathy with the market, fell off from \$14 to \$12; Kearsa off from \$11 1/2 to \$10 1/2; Osceola from \$27 to \$25; Old Dominion from \$17 1/2 to \$15; Quincy from \$130 to \$125, but this is \$4 off for the extra dividend, due April 10th.

Tamarack met a gain with a bear attack, and dropped from \$110 to \$96, closing \$97. Tamarack, Jr., is \$1 1/2 off, at \$14 1/2, and Wolverine fell from \$7 1/2 to \$7. Tecumseh showed a single sale at \$3 1/2, without change.

The gold stocks are again out of favor. Boston & Cripple Creek seems to have deserted the market; no sales since last Friday at 30c., same as before. Gold Coin is gradually settling, and is now 62 1/2c. against 75c. last week. Merced has had the worst break of all, going down from \$30 to \$19, and closing \$20. The report of the shutting down at the mine caused the first break in the stock of some \$3 or \$4 per share, and although the report was denied, apparently officially, the stock did not rally at all. There is an uneasy feeling with the public, which is having its effect on the market. There are rumors of an assessment. Pioneer has been much less active than usual, but at lower figures, declining from \$9 to \$7 1/2 and closing at \$8; the great speculative movement seems to be over, at least for the present. Santa Ysabel has shared the fate of others, declining from \$15 1/2 to \$13 1/2 and closing at \$14 1/4. Altogether this has been a lively week in the gold mining properties. It is reported that work has been resumed on the Santa Rosa of California with a force of 35 men, and that nearly all of the \$10,000 required to put the company in condition has been raised.

Chicago. March 25.

(From Our Special Correspondent.)

The market has been firm and fairly active on the Chicago Mineral and Mining Board throughout the week, the interest centering largely in Sunnyside-Gilpin. The fluctuations for this stock were within a range of three cents and closed firm at the opening price. This company is now erecting a new plant for the treatment of its own ore and it is a steady shipper.

Bullish reports are constantly coming regarding Finance. Three shipping shafts will be completed within the next month. A telegram from Cripple Creek to-day announces an average of \$90 per ton from a mill run, just made of two cars of its ore.

Of the C. C. G. M. Bonding and Leasing Company 27,000 shares were sold at 7c., and this stock is now held firm at 10c.

Cripple Creek & Central City has advanced 1 1/2 over last week's closing price. The mine is now a regular shipper. Rhyolite has for some time shown a declining tendency, and closed two cents off for the week. Two new properties have just been listed, the Sun Dance, of Arizona, and the Cripple Creek Golden Group, of Cripple Creek.

Mr. C. C. Chapin, a member of the Exchange, recently returned from Cripple Creek, presented to the Board an elegant specimen of gold-bearing rock weighing 25 lbs., and containing \$600 in gold. This specimen was tendered on behalf of Mr. Frank P. Lauthlin, owner of the Christmas mine, and will grace the Board's cabinet of mineral specimens.

The following table gives the highest prices with sales of the stocks recorded on the Chicago Mineral and Mining Board for the week ending March 25th:

Table with columns: Stocks, Mar. 19, Mar. 20, Mar. 21, Mar. 23, Mar. 24, Mar. 25, Sales. Lists various stocks like Boston & C.C., Capazone, C.C. & C.C., etc.

Total shares sold, 627,700.

Cleveland, O. March 26.

(From Our Special Correspondent.)

The iron ore stocks are very quiet this week. The transactions that are done are for small holdings, and the prices are about the same as last week. Buyers are not in the market, and the possible sellers recognize the conditions, and are not offering their shares freely. Following are current quotations:

Table with columns: Name of Company, Par val., Bid., Ask. Lists companies like Aurora, Chandler, Cleveland-Cliffs Iron Co., etc.

Colorado Springs, Colo. March 21.

(From Our Special Correspondent.)

Although the market during the first part of the week ruled fairly firm, the close has shown some weakness, and with but few exceptions prices declined in proportion. One of the prominent brokers here voices the sentiment of many people when he states that he considers the present declining tendency to be of benefit to the market in general. Too many unreliable companies have been incorporated, and their stocks advertised for sale, so that the really reliable companies have suffered to a greater or less extent. These "wildcats" cannot flourish save in a booming market, whereas the legitimate concerns desire rather a moderately active market provided it is steady.

The inquiries from the East have been growing somewhat fewer. Brokers, however, state that they have a fair amount of buying orders on hand, though at lower figures than now rule. If the market should continue to go down these orders might be filled, and the decline checked. Should that happen, a reaction upward is to be expected.

BY TELEGRAPH.

Messrs. Gardner & Co. furnish the closing quotations of the Colorado Springs Mining Stock Ex-

change for the week ending March 26th, as follows:

Table with 7 columns: Name of Company, Mar. 20, Mar. 21, Mar. 22, Mar. 23, Mar. 24, Mar. 26. Lists companies like Alamo, Anaconda, Arcentum Juniors, etc.

In addition to the above quotations Messrs. A. Pick & Co., of New York, furnish the following:

Table with 7 columns: Name, Mar. 20, Mar. 21, Mar. 23, Mar. 24, Mar. 25, Mar. 26. Lists companies like Bankers, Des Moines, Gold & Globe, etc.

Salt Lake City, Utah. March 21. (Special report of James A. Pollock.)

The stock market was a trifle slow and seemed to be awaiting the development of outside buying power, yet the events of the week have not been entirely unfavorable from an investment point of view.

Ajax just about held its own, there being some considerable business in the stock at about the previous week's figures. Several important strikes have been reported from the properties.

Bogan continues to hold up well. Bullion-Beck showed an increase of strength. The dividend of 15 cents per share has been distributed.

Centennial Eureka stockholders have shown their supreme faith in the board of directors by unanimously ratifying the option on the stock of the company at \$90 per share, net.

Mammoth was considerably stronger in the bidding, and held at about the previous week's figures. Since the company paid the last of its debt it has been adding good profits to its surplus.

The stock of the Overland Gold Mining Company, whose properties are located directly north of and adjoining the Sunshine, was put on the market yesterday at 50 cents per share, only a limited amount of the 80,000 shares of treasury stock being for sale.

Lack of information from the Sunshine management, coupled with the desire of a few of the early subscribers of the stock to liquidate, prevented that stock from advancing to the figures which it should in all justice maintain.

San Francisco. March 21.

(From Our Special Correspondent.)

The market was a little more active this week, and on one or two days there was quite a show of animation. It was rather forced and spasmodic, and did not go far enough to raise prices materially.

The refusal of the Hale & Norcross miners to work under Mr. Tanagerman was a topic of interest, and was very freely discussed. The alleged reason was a fear that the economies of the new management would extend to a reduction of miners' wages.

There is some comment on the fact that the negotiations for the renewal of the privileges of the Bank of France are still suspended, and nothing has been done in the matter for several months.

Speculation and all business are suffering from the political situation. Just at present matters are quiet, but everyone is in suspense, and the general feeling is of doubt as to the future.

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THE NEW EXCHANGE.

The Call Board of the Gold Mining Exchange commenced business in an informal way on Monday, March 16th, at 10:30 a. m. The list of stock which are all California gold properties is as follows: Amalie, Kern County; Providence and Champion, Nevada County; Grant, Tuolumne County; Kennedy and Keystone, Amador County; Savannah, Fresno County; Thorpe, Calaveras County. Several good mines are under consideration and the engineers of the Exchange are now examining a promising property in Fresno County.

Paris. March 15.

(From Our Special Correspondent.)

Our stock market has been rather quiet this week and the changes have not been marked. The most active dealing has been in the metallurgical stocks, which are still showing increases in price.

The copper stocks have been quiet this week, with slight losses in quotations on very small dealings.

The South African gold stocks have been very quiet, with prices rather weak, but no considerable fall in prices. There is still much discussion of the best way to rebuke the managers who have been using the money and influence of their companies to foment political troubles.

Huanchaca (silver) was quoted this week at 70 fr., but since then has fallen to 72:50 fr., on unfavorable rumors. It was at first reported that there had been an explosion of gas in the mine, which seemed a little improbable for a silver mine.

The tendency toward investments in Russia continues. The stocks of the older companies, like Dombrowa are all in demand and strong. There has been considerable interest lately in Prokhoroff Company, which has a large coal property in the Donetz basin.

The six great railroad companies and the State railroads together last year used 8,241 tons of steel rails. This was the smallest quantity used in any year since 1890. In 1894 the companies' purchases were 110,609 tons of rails; in 1893 they were 129,338 tons; in 1892, nearly twice as great as last year, or 163,840 tons, and in 1891 they were 112,858 tons.

The foreign merchandise trade of France for the two months to February 29th, is reported by the Ministry of Commerce as follows:

Table with 3 columns: Imports, Exports, Total. Lists items like Food, Raw materials, Manufactures, etc. for 1895 and 1896.

Excess imports, 71,981,000. The increase in imports was very large in February. The greater part was in raw materials.

It seems to be definitely decided that a new Chinese loan of 400,000,000 fr. will be brought out by the Anglo-German syndicate which has been negotiating with the Chinese government for some time.

There is some comment on the fact that the negotiations for the renewal of the privileges of the Bank of France are still suspended, and nothing has been done in the matter for several months.

Speculation and all business are suffering from the political situation. Just at present matters are quiet, but everyone is in suspense, and the general feeling is of doubt as to the future.

MEETINGS.

Table with 4 columns: Name of Co., Location of office, Date, Time. Lists meetings for Bozeman, Cleveland, Colo. C. & I. Co., etc.

ASSESSMENTS.

Table with 5 columns: Name of Co., Loc'n., No., Dlnq., Sale, Amt. Lists assessments for Belcher, Brunswick Cou., Bullion, etc.

*New assessment.

DIVIDENDS.

Table with 4 columns: NAME OF COMPANY, Current Dividends, Paid since Jan. 1, 1896, Total to date. Lists dividends for Aetna Con., Alaska-Mexican, etc.

* February dividend paid.

This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information.

STOCK QUOTATIONS.

BOSTON, MASS. Table with columns for Name of Company, Location, Par value, and dates from Mar. 21 to Mar. 26. Includes companies like Allouez, Arnold, Atlantic, etc.

NEW YORK. Table with columns for Name of Company, Location, Par value, and dates from Mar. 11 to Mar. 27. Includes companies like Alamo, Alice, Alliance, etc.

* Official quotations Boston Stock Exchange. Total sales, 64,955.

* Official quotations Con. Stock & Petroleum Exchanges. Total sales, 19,340.

INDUSTRIAL COAL AND COAL RAILROAD.

Table with columns for Name of Company, Par value, and dates from Mar. 21 to Mar. 27. Includes companies like Balt. & Ohio, Ches. & Ohio, Col. C. & I. Dev, etc.

PITTSBURG, PA. Week ending Mar. 26.

Table with columns for Name of Company, Location, Par value, Bid, Ask, and Selling price. Includes companies like Mansfield, N.Y. & C. Gas Co, etc.

* Official quotations N. Y. Stock Exchange. Total shares sold, 70,545.

* Official quotations Pittsburg Stock Exchange.

COLORADO SPRINGS, COLO.

Table with columns for Name of Company, Par value, and dates from Mar. 16 to Mar. 21. Includes companies like Ajax, Alamo, Am. Iron & Steel, etc.

ST. LOUIS, MO., STOCKS. Week ending Mar. 24.

Table with columns for Name of Company, Company's Office, Par Value, Bid, Asked, and Last Dividend. Includes Central Lead, Con. Coal, etc.

Total shares sold: Listed, Unlisted. * Official quotations and sales Colo. Springs Mg. Stock Assoc. * Board of Trade Exchange.

SAN FRANCISCO, CAL.

Table with columns for Name of Company, Location, Par Value, and dates from Mar. 21 to Mar. 27. Includes Alta, Belcher, Best & Belcher, etc.

* Official telegraphic quotations, San Francisco Stock Exchange.

BALTIMORE, MD. Week ending Mar. 25.

Table with columns for Name of Company, Loc, Par value, Bid, Ask, and Name of Company, Loc, Par value, Bid, Ask. Includes Balt. M. & S. N. C., etc.

* Official quotations Baltimore Stock Exchange.

MISCELLANEOUS SECURITIES. Mar. 25.

Table with columns for Name of Company, Location, Par Value, Bid, Ask. Includes American Coal, Chattanooga Ore & Iron, etc.

LONDON. March 14.

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations. Lists various mining companies like Alaska-Treadwell, Elkhorn, Harquahala, etc.

DENVER, COLO.

Table with columns: NAME OF COMPANY, Par value, Mar. 16, Mar. 17, Mar. 18, Mar. 19, Mar. 21, Mar. 21, Sales. Lists companies like Agate, Alamo, Amity, etc.

PARIS. Week ending March 13.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Divs. last year, Prices. Lists companies like Acieries de Creusot, Firminy, etc.

All the companies are located in Colorado. Total shares sold: Listed, 251,550; unlisted, 588,800.

PHILADELPHIA, PA.*

Table with columns: NAME OF COMPANY, Location, Par value, March 19, March 20, March 21, March 23, March 24, March 25, Sales. Lists companies like Acet. L.H. & P., Bethlehem Iron, etc.

MEXICO. Week ending Mar. 19

Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Prices. Lists companies like Amistad y Concordia, Angostus, etc.

NOTE.—In most Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Prices are in Mexican dollars.

VALPARAISO, CHILE.* Fortnight, Feb. 15.

Table with columns: NAME OF COMPANY, Capital, Share value, Last Dividend, Prices. Lists companies like Arturo Prat, Caracoles, etc.

* Special Report of Jackson Bros. Values are in Chilean pesos or dollars.

SHANGHAI, CHINA. Feb. 21

Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Price. Lists companies like Jelebu Mfg. & Trad., etc.

* Special Report of J. P. Bissett & Co. The prices quoted are in Shanghai taels.

SALT LAKE CITY, UTAH.* Week ending Mar. 21.

Table with columns: Name of Company, Par value, Bid, Asked, Actual selling price, Name of Company, Par value, Bid, Asked, Actual selling price. Lists companies like Ajax, Alliance, etc.

* Special Report of James A. Pollock. † All the companies are located in Utah.

ASPEN, COLO.* Week ending Feb. 12

Table with columns: NAME OF COMPANY, Location, Par value, Bid, Asked, Sales, Price. Lists companies like Alta Argent., Argentin-Juniata, etc.

* Special Report of J. F. MacMillan. Total sales, 97,600.

HELENA, MONT.* Week ending Mar. 14.

Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bid, Asked, Shares sold, Price, Date. Lists companies like Am. Dev. & M. Co., Bi-Metallic, etc.

* Special Report of Samuel K. Davis. Total shares sold, 148,700.

DULUTH, MINN.* Week ending Mar. 21.

Table with columns: NAME OF COMPANY, Location, Company's Office, Par value, Bid, Asked. Lists companies like Adams Iron, Biwabik Mt. Iron, etc.

* Special Report of S. E. Smith.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and Amount of Last. Includes entries for Adams, Alaska, American Belle, etc.

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. + The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. † Previous to the consolidation in August, 1884, the California had paid \$31,330,000 in dividends and the Cons. Virginia \$42,390,000. NOTE.—Corrections to this table are made monthly. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

CLASSIFIED LIST OF ADVERTISERS.

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

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

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

1439 WANTED - A PRACTICAL MECHANIC, to have charge of large hoisting and compressing machinery, and also supervise machine shop, at an iron ore mine in Michigan. Must be a draftsman. Address A., ENGINEERING AND MINING JOURNAL.

1440 WANTED - GRADUATE OF TECHNICAL SCHOOL as assayer and assistant to the manager of gold mine in Oregon. No practical knowledge required. Salary to start with, \$75 a month; will increase soon if services are satisfactory. Address R. H., ENGINEERING AND MINING JOURNAL.

1441 WANTED - ASSAYER AND METALLURGICAL CHEMIST wanted as assistant in private assay laboratory in Chicago; must be able to give instruction to students in such branches and make himself generally useful. Really competent men only need answer. Give full details as to age, experience, ability and salary expected, which must be moderate. Address ASSISTANT, ENGINEERING AND MINING JOURNAL.

1442 WANTED - A MAN THOROUGHLY familiar with brass and copper sheet rolling, and capable of making a detailed report upon the same. Address SHEET BRASS, ENGINEERING AND MINING JOURNAL.

1443 WANTED - A CHEMIST, PRACTICALLY familiar with the manufacture of fine medicinal chemicals. One who has been, or is employed in one of the large plants of this sort, preferred. A good opportunity for a young man to show his ability. Address Z., ENGINEERING AND MINING JOURNAL.

1444 WANTED - YOUNG MAN, GRADUATE in chemistry, possessing high-grade technical ability and originality, for position in new electro-chemical industry. One residing in or near New York City preferred. Give references and particulars. Address ELECTRO-CHEMISTRY, ENGINEERING AND MINING JOURNAL.

1447 - WANTED - FOR A GOLD MINE in Georgia, competent assistant foreman; also nine miners experienced in the use of power drills as head men; chance for family without children to take charge of boarding house for 40 men; references required; state wages expected for steady work. Address GOLD STAR, ENGINEERING AND MINING JOURNAL.

1448 WANTED - A CHEMIST WELL UP in the manufacture and analysis of salts. State age, experience and salary expected. Address SODIUM, ENGINEERING AND MINING JOURNAL.

1449 WANTED - ASSAYER AND CHEMIST at gold mine using cyanide process. Have references and experience. Address C. N., ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

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MINING AND MECHANICAL ENGINEER, who has made a speciality of the construction and operation of cyanide and chlorination mills, thoroughly familiar with best modern practice, will accept position as superintendent of works, or with large mining machinery manufacturers, where such knowledge will be of advantage, can bring full line of plans and details. First-class references. Address C. and C., 206 Boston Building, Denver, Colo. No. 17,382, April 18.

A COMPETENT ASSAYER DESIRES POSITION, after April 1, either in the United States, Mexico or South America. At present with the largest smelter in the East. Address H., ENGINEERING AND MINING JOURNAL. No. 17,378, April 4.

MINING ENGINEER - GRADUATED FROM Columbia School of Mines, would like position of assistant to superintendent, in charge of mines or reduction works. Address L. H. B., ENGINEERING AND MINING JOURNAL. No. 17,377, April 18.

EXPERIENCED COPPER METALLURGIST is open for engagement. Economic manager, and well posted in all latest improvements. Speaks Spanish fluently and would go to Mexico. Best references. Address COBRE, ENGINEERING AND MINING JOURNAL. No. 17,380, April 18.

POSITION WANTED - BY AN EXPERIENCED young chemist and assayer. Graduate of a well-known technical school, and has managed a commercial analytical laboratory. Can give all references. Address S. A. E., ENGINEERING AND MINING JOURNAL. No. 17,383, April 11.

WANTED - POSITION AS MANAGER OF gold mine or assayer. British Columbia preferred. Best of references. Address H. K. WALTON, Box 407, Central City, Colo. No. 17,384, April 18.

CHEMIST WANTED FOR A VIRGINIA Furnace Works. Must work very accurate and be able to give proof of his ability. A good position for a good man. Address E. J. S., ENGINEERING AND MINING JOURNAL.

MINING ENGINEER (AGE 25) DESIRES engagement as assistant manager, chemist, assayer, or other suitable employment with mine or smelter after May 1st. Expert accountant. Address, P., ENGINEERING AND MINING JOURNAL. No. 17,385, April 25.

Contracts Open.

PIPE SEWERS. - Sealed proposals will be received by the Mayor and City Council of Eufaula, Ala., until April 23, 1896, for constructing pipe sewers and for furnishing sewer pipe (separate bids). Extent of proposed work is 7 3/4 miles of pipe sewers from six (6) to eighteen (18) inches in diameter. Plans and specifications will be on file at the office of the City Clerk, and copies of specifications, forms, etc., may be obtained from the City Clerk, after March 20, 1896.

MARBLE WORK AND METAL WORK. - Office of Building for Library of Congress, Washington, D. C. Separate sealed proposals will be received at this office until the 7th day of April, 1896, and opened immediately thereafter in presence of bidders, for furnishing and delivering the following materials and work, namely: 1. Marble floor tiling for the two West curtains; 2. Mosaic floors for Main Stair Hall and three corner Pavilions; 3. Marble and Granite floor for south curtain; 4. Miscellaneous woodwork; 5. Bronze and iron park lamp-stands and lamps. Specifications, general instructions and conditions, and blank forms of proposal may be obtained on application to this office. BEHNARD R. GREEN, Supt. and Engineer.

WATER-WORKS. - Sealed proposals will be received by the Mayor and City Council of Eufaula, Ala., until April 23d, 1896, for constructing a system of water-works, and for furnishing the materials for the same. Works will embrace approximately 10 1/4 miles of pipe, stand-pipe, and other appurtenances. Plans and specifications will be on file, and may be seen at the office of the City Clerk, and copies of specifications, forms, etc., may be obtained from the City Clerk after March 20th, 1896.

WATER-WORKS. - Sealed proposals for furnishing and laying 10 1/4 miles of cast iron pipe, specials and gates, sizes 4 in. to 12 in., will be received by the Board of Water Commissioners of the Village of Nyack, at their office at Nyack, N. Y., until April 8th, 1896. Proposals will be received for material and labor separately, or material and labor combined. Specifications may be obtained and plans seen at the office of the Commissioners, at Nyack, N. Y., after March 20th, 1896. A bond of \$10,000 with sureties will be required from the contractor, and a certified check for \$500 must be deposited with proposal.

CEMENT. - U. S. Engineer office, Mobile, Ala. - Sealed proposals for furnishing hydraulic cement, gravel or crushed stone or broken stone and sand at McGreys Shoals Landing, Tombigbee River, Ala., will be received here until April 9th, 1896. Information furnished on application. WM. T. ROSELL, Major, Engineers.

BRIDGE - Bids will be received at my office in Hawkinsville, Ga., until May 6th, 1896, for furnishing material and placing iron or steel viaducts to west side approaches to river bridge, at Hawkinsville, in lieu of present wooden structure. Total length of said approaches is about four hundred (400) feet. Bids are asked on two hundred (200) feet of same, with privilege of whole length. The right to reject any or all bids is reserved. For further particulars address me, at Hawkinsville, Ga., P. T. McGRUFF, Ordinary Pulaski County, Ga.

BRIDGE - Office Commissioners of Roads and Revenues, Fulton County, Georgia, Atlanta, Ga. - Sealed proposals will be received at this office until the 6th day of May, 1896, for furnishing all material and labor and building complete, ready for use, the Bridge over Peachtree Creek on Peachtree road, about five miles from the City of Atlanta, in accordance with plans and specifications prepared by Grant Wilkins, Engineer, copies of which can be had by bidders upon application to the undersigned or to the Engineer. Each bid must be accompanied by a certified check for the sum of Two Hundred and Fifty Dollars, payable to C. A. Collier, Chairman Commissioners of Roads and Revenues of Fulton County. The right is reserved to reject any or all bids. All proposals to be addressed to the undersigned, and must be made upon the blank form for proposal attached to the specifications. ANTON L. KONTZ, Clerk Commissioners Roads and Revenues for Fulton County, Atlanta, Ga.

WATER-WORKS. - Sealed proposals will be received by the Town Board of Sullivan, Ind., until April 18th, 1896, for the construction of a complete system of water-works, including pumping plant, stand pipe, filter, dam, six miles of 12 to 4 in. pipe, 49 hydrants. Each proposal must be sealed and addressed to the Clerk of the Board and must be accompanied by a certified check equal to 5% of the amount bid, made payable to Fred Hoke. The Town Board reserves the right to reject any and all bids. Maps, plans and specifications may be seen and examined at the office of the Town Clerk, or at office of Engineer at Indianapolis, to whom all inquiries may be addressed. WAKE GILES, President, Fred Hoke, Clerk, JOHN J. HAINSWORTH, Engineer, 66 Ingalls Building, Indianapolis.

BRIDGE. - Bids will be received at my office, in Hawkinsville, Ga., until the 6th day of May, 1896, for furnishing material and placing iron or steel viaducts to west side approaches to river bridge, at Hawkinsville, in lieu of present wooden structure. Total length of said approaches is about four hundred (400) feet. Bids are asked on two hundred (200) feet of same, with privilege of whole length. The right to reject any or all bids is reserved. For further particulars address me at Hawkinsville, Ga. P. T. McGRUFF, Ordinary, Pulaski County, Ga.

STONE. - U. S. Engineer Office, Cincinnati, O. - Sealed proposals for furnishing and delivering about 7,612 cu. yds. of stone for Lock No. 7, Kentucky River, near High Bridge, Ky., will be received here until April 1st, 1896. Information furnished on application. JAMES F. GREGORY, Maj. Engrs.

MATERIALS FOR CONCRETE. - U. S. Engineer Office, 1428 Arch street, Philadelphia, Pa. - Sealed proposals for furnishing and delivering cement, broken stone and sand at Finn's Point, N. J., will be received here until April 9th, 1896. Information furnished on application. C. W. RAYMOND, Maj. Engrs.

CONCRETE. - U. S. Engineer Office, 1428 Arch St., Philadelphia, Pa. - Sealed proposals for furnishing and delivering cement, broken stone and sand at Finn's Point, N. J., will be received here until April 9th, 1896. Information furnished on application. C. W. RAYMOND, Maj., Engrs.

PUMPING ENGINE. - Office Board of Trustees of Water-Works, Sandusky, O. - Sealed proposals will be received at the office of this Board, in the city of Sandusky, O., until the 1st day of May, 1896, for remodeling a 3,000,000-gal. pumping engine now in the pumping station of the water-works of said city, according to specifications therefor, which are on file in the office of said Board. All proposals must be on blanks which may be obtained at the office of the said Board. Each bid must be accompanied by a certified check, drawn to the order of the Secretary of said Water-Works, in the sum of \$300, as a surety that if the bid is accepted a contract will be entered into. The right is reserved to reject any or all bids. P. J. CROSEN, President; ADAM KOLB, O. DEHNEL, Trustees; C. A. JUDSON, Superintendent.

WATER-WORKS. - Notice is hereby given that the Village Council of the Village of Hector, Minn., will construct a system of water-works for the supplying of water for public and private use in said village and will let the contract for the construction of the same to the lowest responsible bidder.

All bids for the construction of said system of water-works must be received by the Village Recorder of said village until April 15, 1896. Said system of water-works will be constructed in accordance with the plans and specifications for the same now on file in the office of the Village Recorder of said village. The Village Council of said village hereby reserves the right to reject any and all bids. JAMES CHAPMAN, Village Recorder.

BRIDGE. - Bids will be received at my office in Hawkinsville, Ga., until the 6th day of May, 1896, for furnishing material and placing iron or steel viaducts to west side approaches to river bridge, at Hawkinsville, in lieu of present wooden structure. Total length of said approaches is about four hundred (400) feet. Bids are asked on two hundred (200) feet of same, with privilege of whole length. The right to reject any or all bids is reserved. For further particulars address me, at Hawkinsville, Ga. P. T. McGRUFF, Ordinary, Polaski County, Ga.

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MEETINGS.

THE REGULAR ANNUAL MEETING OF the Stockholders of the Bulwer Consolidated Mining Company will be held at the office of the company, Room 33 Nevada Block, No. 309 Montgomery Street, San Francisco, Cal., on Wednesday, the eighth (8th) day of April, 1896, at the hour of one (1) o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting.

Transfer books will close in New York City on Thursday, March 26th, 1896, at 3 o'clock P. M., and at San Francisco on Saturday, April 4th, 1896, at 12 o'clock M.

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COMPETENT ASSAYER DESIRES SITUATION. Graduate Missouri School of Mines, '87. Can take charge of sampling works or assist mine manager. Address O. L., Denver office **ENGINEERING AND MINING JOURNAL,** 206 Boston Building, Denver, Colo. No. 17,386, April 25.

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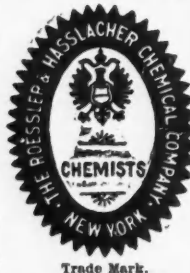
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