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CONTENTS.

	Page.		
Lead Exports.....	205		
Steel Production in 1896.....	205		
The Eastern Zinc Consolidation.....	205		
Leadville Iron and Manganese Ores.....	205		
Queensland Gold Production.....	205		
Sulphur Production in Sicily.....	206		
Science and Industrial Progress.....	206		
Exports of Steel Rails.....	206		
New Publications.....	207		
Books Received.....	207		
Some Idaho Mining Districts.....	A. Walker 207		
Chrome Ore for Furnace Lining.....	Herbert Lang, George W. Maynard 20		
The Production of Electricity from Carbon at Ordinary Temperatures.....	208		
The Mineral Production of Canada in 1896.....	208		
Bessemer Steel Production of the United States.....	208		
The Randeburg Mining District, California.....	F. M. Endlich 209		
The Bradley Aluminum Patents.....	210		
The Advantages of Parting Dore Bullion at Individual Works.....	Titus Ulke 211		
* Dredging for Gold in Southern River Beds.....	211		
Mining in Yavapai County, Arizona.....	John F. Blandy 212		
* New Single and Double Hoisting Engines.....	213		
The Hocking Valley Coal Region in Ohio.....	213		
Recent Decisions Affecting the Mining Industry.....	214		
Sulphur Production in Sicily.....	214		
Patents Relating to Mining and Metallurgy.....	214		
Notes: Iron Ore Trade in Belgium, 210—Coke from Peat, 210—Bog Iron Ore in Finland, 211—New Russian Manganese Deposits, 211—Coal in Dalmatia, 212—Railroads in Russia, 212—Coal Trade of Austria-Hungary, 212—Iron Production in Spain, 213—Petroleum for British Gas Works, 214—A Traveling Gold Mill, 214—Coal Production in Spain, 214—Russian Petroleum Exports, 214—Iron and Steel Imports in India, 214.			
* Illustrated.			
Personal..... 215	Utah..... 219	Philadelphia..... 221	Salt Lake City..... 224
Obituaries..... 215	Washington..... 219	Pittsburg..... 221	San Francisco..... 224
Societies and Technical Schools..... 215	West Virginia..... 219	Gold & Silver..... 223	Spokane..... 225
Industrial Notes..... 215	Wyoming..... 219	Prices, Statistics, Imports and Exports..... 223	Br. Columbia..... 225
Trade Catalogues..... 215	Foreign: Africa..... 219	Foreign Coins..... 223	London..... 225
Machinery and Supplies Wanted..... 215	Br. Columbia..... 219	Copper..... 223	Paris..... 225
Mining News.	Cuba..... 219	Tin..... 223	
United States:	Mexico..... 219	Lead..... 223	Quotations:
Alaska..... 215	Ontario..... 219	Spelter..... 223	Boston..... 226
Arizona..... 216	Quebec..... 219	Antimony..... 223	Ind. and Coal..... 226
California..... 216	Queensland..... 219	Nickel..... 223	Colo. Springs..... 226
Colorado..... 216	South Africa..... 219	Platinum..... 223	New York..... 226
Idaho..... 217	West Australia..... 219	Quicksilver..... 223	Pittsburg..... 226
Michigan..... 217		Minor Metals..... 223	St. Louis..... 226
Minnesota..... 217			San Francisco..... 226
Missouri..... 218			Baltimore..... 226
Montana..... 218			Miscellaneous..... 226
Nevada..... 218			London..... 227
New Jersey..... 218			Paris..... 227
New Mexico..... 218			Mexico..... 227
Pennsylvania..... 218			Valparaiso..... 227
			Shanghai..... 227
			Denver..... 227
			Philadelphia..... 227
			Salt Lake City..... 227
			Aspen..... 227
			Helena..... 227
			Duluth..... 227
			Mining Co's:
			List of..... 228
			Advt. Index 17
			Advt. Rates 18

Shipments of a considerable quantity of lead have recently been made from the Colorado smelters to Europe by way of Galveston, Tex., going to that port by rail from Pueblo. At present prices of the metal abroad, there is probably more profit in shipping lead in this way than in marketing it in the East, where demand is at present light and sales are made below the European quotations. It is a question, however, how far this trade can be carried on without causing lower prices on the other side. A good deal of Mexican lead, refined in bond, has also been going abroad, and there is a limit to the demand there. The Spanish mines were very active last year, under the stimulus of higher prices, and supplies have been increased until there is some risk that they may exceed the demand; although business is very active all over Europe.

The Bessemer steel production of the United States, as reported by the American Iron and Steel Association, amounted in 1896 to 3,919,906 long tons. This showed a decrease of 989,223 tons, or 20 per cent., from the great output of 1895, but was nevertheless greater than that reported for any previous year except 1892. The figures, which are given in detail in another column, do not, however, fully express the changes in our steel production. They relate to Bessemer steel alone, and in the last five years there has been a rapid growth in the output of open-hearth steel; much greater in proportion than that in Bessemer, though the latter still remains the more important part of our production. Our Bessemer plants now have a capacity of over 6,000,000 tons a year, and their output exceeds that of any other country in the world. Even with the decrease from 1895, the make last year was equal to that of all kinds of steel in Great Britain.

The figures for open-hearth steel are not yet complete, but they will probably be sufficient to bring our total steel production for 1896 up to about 5,500,000 tons.

A short time ago—in the *Journal* for December 5th, 1896—we recorded the end of the long litigation between the Lehigh Zinc and Iron Company and the New Jersey Iron and Zinc Company over the great ore deposit at Mine Hill, near Franklin Furnace in Sussex County, N. J. Since that time negotiations have been in progress which have finally resulted in the combination in one company of about all the zinc mining and manufacturing interests of the East. The new corporation is to be known as the New Jersey Zinc Company, and it will own all the properties heretofore owned or controlled by the New Jersey Iron and Zinc Company, the Lehigh Zinc and Iron Company, the Passaic Zinc Company, the Florence Zinc Company, and also the Mineral Point Zinc Company of Wisconsin. The properties include the extensive ore deposits in Sussex County above referred to, with the works there, at Newark, N. J., at Bethlehem and Florence in Pennsylvania, and the mines in Wisconsin. The company will be an important factor in the spelter market and will practically control the manufacture of zinc oxide or zinc white, which is growing steadily. We understand that the new company will consolidate its works with a view to economy in management, and will introduce improvements on a large scale, bringing its plants and processes up to a high standard.

The Leadville mines will probably be benefited considerably by the increasing demand for the low-grade iron ores, of which they have a very large supply. Heretofore the smelting charges have been such that it would not pay to mine any of these ores which returned less than seven ounces of silver to the ton. These ores are now in demand, and the smelters have not only reduced treatment charges from \$1.25 to 75 cents a ton, but are offering to buy these ores at \$2.50 a ton for all running 45 per cent. iron and carrying three ounces of silver, an addition to this price to be paid for any excess of iron over the proportion named. Under these conditions very large quantities of this ore will probably be mined.

The Leadville manganiferous ores are also in demand just now. It will be remembered that the Illinois Steel Company last year took some 20,000 tons from the mines, and the results obtained with it have been so satisfactory that the same company has contracted to take some 60,000 tons of this ore, to be delivered during 1897. This will be a welcome addition to the shipments of the camp.

Meantime, the strike excitement is gradually subsiding, and though the strike has not been declared off, it is understood that many men are going to work quietly. On the whole, we are pleased to note that the condition and prospects of the Leadville district are improving.

The official returns which we have just received from Queensland show that the total production of gold in that colony in 1896 was 638,212 crude ounces, which is equivalent, at the usual rate for this gold, to 526,525 fine ounces, or \$10,883,272. The increase over 1895 was 15,212 crude ounces, or 2.4 per cent. This is quite encouraging, since a slight reduction had been looked for. The Charters Towers District continues to lead all the others, the gold obtained from that district forming about 40 per cent. of the total yield. It is noticeable that in 1896 about 17.5 per

cent. of the total of the Charters Towers mines was derived from reworking tailings, which is now being systematically done at several of the larger mines. The second district in importance was Crocodile Creek, in which the Mount Morgan mine is included, and which supplied about 24 per cent. of the total.

Queensland is the fourth of the Australasian colonies to have the full report of gold production ready; and the corrected figures will not greatly change our estimate of January 2d. The only important producer which has not yet completed its statement is New South Wales; the outputs of South Australia and Tasmania being comparatively small.

The Queensland production is chiefly from quartz mining, the proportion from placers being small. The increase was chiefly from more active working of the older mines, many of which are now reaching considerable depths; although a good deal of prospecting is going on at the present time.

We publish in another column some interesting figures with regard to the production of sulphur in Sicily. These figures show that although the price of sulphur last year was increased over 30 per cent. as a result of the combination of the producers, there was an increase of about 14 per cent. in the exports and sales abroad, apparently showing that the price had very little effect upon the demand. The Sicilian deposits furnish by far the greater part of the supply of Europe and the Eastern United States. Part of the gain is certainly due to the improved industrial conditions in Europe, and the increased demand for sulphuric acid in the various chemical industries. It is not safe to assume, as our Italian contemporary, the *Rassegna Mineraria* does, that increased prices have been proved to have no effect upon the demand for the Sicilian product. It is true that the effect may not be felt for a year or two, but the supremacy which Italian sulphur has maintained in the markets of the world has been due to the low price at which it has been furnished. Any permanent increase beyond a certain point is sure to promote the search for and the exploitation of sulphur deposits in other countries. In the United States there are already known such deposits, which can be worked at a profit under suitable conditions, and which we believe could be made in time to supply the greater part, or possibly the whole, of our own requirements. There can be no doubt also that a high price of sulphur, if maintained, will promote the use of pyrites in acid manufacture to a very much greater extent than our contemporary thinks probable. A maintenance of high prices for another year or two will certainly show marked results. We are far from wishing that the Sicilian mining industry should again subside into the miserable condition, caused by excessively low prices and adherence to antiquated methods, from which it is just emerging; but economic conditions cannot be neglected, and the Sicilian producers must remember that in the modern business world competition is exceedingly keen, and it is not safe to assume that other countries will neglect the resources which they are known to possess for any length of time.

Science and Industrial Progress.

Never before in the history of the world was progress in industry so rapid as it is at present, and this is due especially to the adoption of scientific methods in manufacturing. The wonderful advance made by Germany in recent years is due especially to its almost universal application of science in industry. The chemist is the mainspring of German industrial progress, a progress that is making very serious inroads into British trade. Every manufacturing works, from Krupp's great steel works down, is now provided with a laboratory, and many maintain very large forces of chemists on original investigations.

No manufacturing industry anywhere can to-day prosper unless it avails itself of the work of the chemist in maintaining uniformity and high quality of product and in devising uses for its "waste products," and the American manufacturers, above all others, have need to profit by the German experience in this direction.

Americans possess cheaper and better raw material in the mineral industry than have any European rivals, and when they make full use of the chemist in controlling the quality of their products, and in pointing out scientific methods of manufacture, where the old "rule of thumb" has heretofore governed, and in indicating how dividends can be made out of "waste products," they will control, and in a great measure supply, the markets of the world. Every large iron and steel works, every cement, pottery and brick works, every ore smelting works, should be provided with a well-equipped laboratory under the management of an experienced and skillful chemist, where investigations for the benefit of the works can and should be carried on continuously.

Our large steel works in Pittsburg, Chicago, and at other points, are already alive to the value of such laboratories, and the Alabama iron masters, who had in the early stages of their iron industry suffered enormous losses for the want of chemists at their furnaces, have made a be-

ginning in the right direction: as a consequence last year the Tennessee Coal and Iron Company made from native ores some 60,000 tons of high-grade basic pig iron, conforming to very stringent specifications—a feat wholly unattainable without the aid of the chemist.

Now in a fit of misguided economy this company is about to reduce its force of chemists to a point that will scarcely be sufficient to do the most necessary analytical work and which must forbid that original research which is at the foundation of all intelligent modern progress. Instead of reducing its force and allowing its efficient chief chemist to leave, this company would be practising a true economy by improving its laboratory and by furnishing him with more assistance and facilities for original investigation.

Where one company cannot afford the expense of a modern laboratory all the furnaces or works in a district might unite in supporting one and thus secure the benefits to all. We recently called attention to a proposal of the Governor of North Carolina to give up the State Geological Survey in order to "economize"; the effect of this would be to withdraw the knowledge of the mineral resources of the State from capitalists, and to "bury its treasures." This species of false economy is apparently popular in the South at present, and in this age of close competition and industrial rivalry its ill effects will quickly become evident in the diversion of capital, and in a retardation of that industrial progress which is the foundation of material prosperity. Economy can and should be practised, but it is often possible to secure it by cutting down salaries of useless, ornamental officials, or by lopping off some dear and unnecessary extravagance in offices or "general expenses." The very worst place to practise it is where it injuriously affects technical progress.

Exports of Steel Rails.

On several occasions during the past year we noted the sale of steel rails by some of our mills for export to Japan, and commented upon the fact that our manufacturers were able to make prices which secured these orders in spite of the competition of English, Belgian and German mills. It was well understood that the advantages possessed in this country—cheap and abundant raw materials and fuel, machinery of the best and latest types and efficient labor—enabled the mills to fill these orders at about \$21.25 per ton, at some profit. These Japanese orders were comparatively small in amount, but they marked the beginning of a new era in our iron trade, and prepared us in some degree to expect what has now happened, though but few looked for such heavy dealings as were announced last week. That an American company should invade the English market and secure heavy orders from some of the largest railroad companies was something so unprecedented that at first it could hardly be realized. A little consideration will show that such a result is quite a natural one under present conditions of the trade.

The English rail-makers have been for some time past very fully occupied, and the price of rails, which two years ago reached its lowest point at \$17.40 (£3 12s. 6d.) per ton at mill—staying there only a very short time however—was gradually increased by the leading makers, who generally act in concert, to \$23.40 at the opening of 1897. Since then it has dropped slightly, and is now \$21.60 per ton. At this price it is quite possible for the Carnegie Steel Company, with its large capacity for manufacture and its admirable equipment, to supply the English market at a profit.

We do not know the exact price at which these English orders were placed, but even if we suppose that they were taken a little below current rates, it would probably be not far from \$21 per ton on dock at the landing port; and at most of the ports on dock means on the cars to which freight can be delivered direct from vessel. At the present time large quantities of heavy freight can readily be contracted for at \$2.50 per ton from New York to a British port, to which 50 cents might have to be added for unloading and dock charges; while the freight and handling from Pittsburg to the shipping port here would be covered by \$1 per ton. This full allowance of charges would make \$4 per ton required to put the rails on the cars of the English railroad; and would leave \$17 per ton for the makers. This is the price at which considerable orders for home delivery have been taken; and as the cost of making a ton of rails now at the mills mentioned is probably below \$15 per ton, it would still leave a good profit to the makers. It is, however, lower than English makers are prepared to go, according to their own statements; for we were told that the \$17.40 price of two years ago was lower than the mills could stand, and at that rate none of them were making any profit, while some were losing.

In most of the current comment these English sales of rails are accepted as a result of the breaking up of the steel-rail pool here. This is a mistake, arising chiefly because the announcement of the sales came almost simultaneously with the break in prices here. The export orders are the result of conditions which now enable our makers to place their surplus products abroad at a cost as low as or lower than that at which the market can be supplied by the home manufacturers. These conditions we have often referred to at length, and briefly outlined in the opening of this article.

This is shown by the fact that rails are not the only form of steel to go abroad. Shipments of billets have already been made and more are to go; and late English papers inform us that Staffordshire mills have begun to use tin-plate bars brought from American mills, and are ordering further supplies. Pig-iron exports are already beginning to be an old story.

One foreign transaction which has come to our knowledge this week is the result of the ending of the rail pool. This is the placing with the Carnegie Company of a contract for 70,000 tons of rails by the Canadian Pacific Railway Company, which has heretofore bought most of its supplies in England. The price is said to be about \$17 at mill.

The American invasion will cause a great sensation in the English trade, and its organs will doubtless seek to convince their readers that it is merely a temporary matter, and can hardly be continued. We believe, on the contrary, that the American competition with foreign mills has only begun; and that British iron-masters will do well to reckon with it as a permanent factor in the trade.

NEW PUBLICATIONS.

GLUCK AUF! 1897. ILLUSTRIRTER KALENDER. Winterberg, Germany; J. Steinbrenner. Pages 162; illustrated.

This is an illustrated calendar or almanac issued yearly for the benefit of those engaged in the mining and metallurgical industries. It is a popular work, having a wide circulation, and has been prepared accordingly. In its general style of contents it follows the publications of the same class by German papers, but because of the matter bearing upon mining and smelting particularly, it appeals more strongly to those engaged in these trades. The title of the almanac, "Good Luck," is indicative of the happy sentiment which pervades throughout, the heavy reading matter and technical side of mining very properly finding no place in it. Story, song, verse and wit are interspersed with the many interesting and instructive sketches.

ONE HUNDRED YEARS: 1796-1896. Philadelphia, Pa.; MacKellar, Smiths & Jordan Foundry. Pages, 96; illustrated.

This beautiful volume has been issued by the MacKellar, Smiths & Jordan Type Foundry to celebrate the one hundredth year of the business, which has been carried on continuously since it was first founded in 1796, by Archibald Binny and James Ronaldson, and is to-day in the hands of their direct successors. The origin of the establishment really dates back further, since the first type foundry in America, which was established by Christopher Saur in Germantown in 1735, was later absorbed by Binny & Robertson. The book gives an interesting history of the typefounder's art in this country and its chief representatives, and an account of the methods now in use. Some specimens of earlier work are presented by way of contrast. The book itself is an admirable example of the typefounders', printers', engravers' and binders' arts; to which the paper-makers' ought to be added also. It would be difficult to find a better specimen of mechanical execution, and on this account alone it would be worth careful preservation by those who are fortunate enough to obtain a copy.

NEW SOUTH WALES: THE MOTHER COLONY OF THE AUSTRALIAS. 1896. Edited by Frank Hutchinson. Sydney, N. S. W.; Government Printer. Pages, 370; with maps and illustrations.

The Australasian colonies generally are quite alive to the advantages to be gained by making their resources and progress known, and New South Wales is the foremost in this direction. The present volume is intended for distribution wherever it is likely to be of service, and has been carefully prepared to show the growth and present condition of the colony. The papers have generally been prepared by experts, and contain a great deal of information, largely in a condensed form. There are special articles on mines and metal mining; on coal mining; on agriculture; on the wool industry; on timber; on water and irrigation, and a number of other topics, including the constitution and laws of the colony, its social and economic conditions. A good deal of space is given to commercial relations and trade. A little more space might have been given to mining, which has had such an important part in the history of the colony. The article on Mines and Mining, by W. H. J. Slee, occupies only 12 pages, and that on Collieries, by John Mackenzie, 8 pages more; which is hardly enough for the proper treatment of the subjects.

Generally speaking, however, the book has been well prepared and ought to be of service to the colony, as well as to those who think of settling or investing there. It is well illustrated and is accompanied by several maps, and ought to convey a fair idea of the country.

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.

North Carolina and its Resources. Raleigh, N. C.; Published by the State Board of Agriculture, 1896. Pages, 413; with map and illustrations.

Glück auf! 1897. Illustrierter Kalender für alle Angehörigen und Freunde des Berg- und Hüttenwesens. J. Steinbrenner. Winterberg, Austria. Pages, 162.

The Undeveloped Coal Fields of Nova Scotia. By E. Gilpin, Jr., Inspector of Mines. Halifax, N. S.; Reprinted from the Transactions of the Nova Scotia Institute of Science. Pamphlet; pages, 16.

Report of the Department of Mines, Nova Scotia, for the Year Ending September 30th, 1896. Charles E. Church, Commissioner of Public Works and Mines. Halifax, Nova Scotia; Queen's Printer. Pages, 76.

Elektrochemische Übungsaufgaben für das Praktikum sowie zum Selbstunterricht. Zusammengestellt von Dr. Felix Oettel. Halle a. S., Germany; Wilhelm Knapp, 1897. Pamphlet; pages, 53; illustrated.

Fourteenth Annual Report of the Bureau of Labor and Industrial Statistics of Michigan, for the year ending February 1, 1897. Charles H. Morse, Commissioner of Labor. Lansing, Mich.; State Printers. Pages, 436.

Recueil de Procédes de Dosage pour l'Analyse des Combustibles des Minerais de fer, des Fontes des Aciers et des Fers. Par G. Arth. Paris, France; Georges Carré et C. Naud, 1897. Pages, 313; illustrated. Price in New York, \$2.80.

Twenty-Fourth Annual Report of the Director of the Mint to the Secretary of the Treasury, for the Fiscal Year ended June 30th, 1896. Hon. Robert E. Preston, Director of the Mint. Washington, D. C.; Government Printing Office. Pages, 591.

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.

Some Idaho Mining Districts.

Sir: The immense area of mineral territory, extending from Warren's to Pierce City, which includes the camps of Florence, Elk City and Dixie, is to be the scene of extended mining operations this season. This territory is all free-milling gold ore on the surface, and in early days was the field of operations for placer mining which equaled California in richness. New reduction plants are being erected all along this belt of mineral, a distance of 230 miles. This territory is drained by Clearwater and its tributaries on the west and Salmon River and its branches on the east, both gold-bearing streams. Two new five-stamp mills are being erected in Pierce mining district this season, one on the Golden and the other on the Bi-metallic group. There are now five five-stamp mills in Pierce, all in active operation. In Elk City development work is being actively pushed and they are attaining greater depth before erecting reduction works. The ledges are larger but the values are not so high as they are in Florence or Pierce. The Blue Drazon is producing a large amount of ore and a mill will be built in the spring. The dredging plant in Elk was a financial success this season and big clean-ups are expected in the coming season.

In Florence, the best gold-bearing ledges have so far been found; Warren's has a few properties, notably the Little Giant, which has been a big producer, although the actual tonnage handled has been small. The Little Giant has produced \$195,000 from 1,670 tons of ore, the greatest depth attained being 187 ft. The Washington mine, in Florence, from a depth of 50 ft. produced \$47,000 from 2,500 tons of ore. In Florence there are at present four steam hoists in active operation, also two more on the road between Lewiston and Florence, which will be running by March 1st. There are also two five-stamp mills and one 10-stamp mill on the way. Recent development on the Banner has opened up an extensive body of ore in the west drift; in the shaft there is at present 32 in. of high-grade ore; and other mines show well.

Florence, Idaho, Feb. 1, 1897.

A. WALKER.

Chrome Ore for Furnace Linings.

Sir: I am obliged to Dr. Egleston for the valuable reference which he has furnished concerning the use of chrome ore for furnace linings. I find on further conversation with Mr. Ropp, of the Selby Smelting Works, that I hardly did the subject full justice from his standpoint, since he finds it necessary to repair the chrome linings of his colossal reverberatory but once a month instead of once a week—an important difference. There seems to be no limit to the endurance of this substance when thus used, and I fully expect to see its use extending in reverberatory practice.

OAKLAND, CAL., Feb. 13, 1897.

HERBERT LANG.

Sir: In confirmation of Professor Egleston's statement in relation to the use of chrome ore in open-hearth furnaces in his communication in your issue of February 6th, I call your attention to the note on page 470, Vol. II., 1893, *Journal of the British Iron and Steel Institute*, where it is stated: "Hitherto the chrome ore used in the lining of open-hearth furnaces has been employed in lump form for that purpose. Now the ore mined near Schweidnitz in Silesia, is converted into a kind of cement. To ordinary fire-resisting cement is added a mixture consisting of 33 to 42 parts of chrome oxide, 18 to 22 parts alumina, and 18 to 22 magnesia, mixed with 10 per cent. of its weight of aluminum acetate."

This is manifestly an unnecessarily expensive mining, as subsequent experience has demonstrated. In Vol. II., 1895, page 506, *Journal of the British Iron and Steel Institute*, reference is made to an article in *l'Echo des Mines*, Vol. XXI., page 584, in the following words:

"According to P. Speier chrome ore linings for reverberatory furnaces have been successfully adopted in French, German and Russian steel-works. The bottom and walls of the furnace are lined with chrome ore in large blocks, united by a cement formed of two parts of chrome ore finely ground, and one part of lime as free from silica as possible. The introduction of chromium from the lining into the bath of molten steel takes place to a very limited extent. The iron chromate is decomposed only under the influence exerted by the reagents and oxidizing alkaline substances. Heat alone is insufficient to decompose chromate of iron, which may float in a bath of molten steel covered with basic slag without dissolving. One of the principal conditions of success in the employment of the chrome ore lining consists in carefully picking the pieces of ore used, which should be of uniform composition, which is found to be from 36 to 40% of chromic oxide, 18 to 22% clay, 9 to 10% magnesia and at most 5% silica."

The consumption of chrome ore in open-hearth basic furnaces in the United States amounts to about 1,800 or 2,000 long tons annually. The

Pittsburg supply has been for the most part from the Province of Quebec. The requirement is for an ore of not less than 45% chromic oxide, but I am informed that the shipments have rarely averaged as high as this. The ore is used in lump form for patching the sides of the basic-lined furnaces, and is found far more convenient and durable than a slurry of dolomite.

There are at least two manufacturers of chrome brick in Pittsburg. The standard bricks measure 9 in. \times 4 $\frac{1}{2}$ in. \times 2 $\frac{1}{2}$ in. and weigh 9 lbs.; they are very hard and durable. They are used as a neutral parting between the basic hearth and silica roof. The iron chromate is not acted upon by silica or lime and magnesia at high metallurgic temperatures. The irregular supply of chrome ore and its high price has undoubtedly had much to do with its relatively limited employment as a refractory. The opening up of the large deposits on the west coast of Newfoundland by the Halifax Chrome Company will, it is believed, result in the employment of chrome ore to a much larger extent for basic linings and also for the manufacture of chrome steel.

A trial lot of 145 tons, containing 49.9% chromic oxide, was shipped to Pittsburg last fall for linings and bricks, and 40 tons to the Nova Scotia Steel Works, at New Glasgow. Large shipments will probably be made during the current year.

GEO. W. MAYNARD.

NEW YORK, Feb. 6, 1897.

THE PRODUCTION OF ELECTRICITY FROM CARBON AT ORDINARY TEMPERATURES.

At a meeting of the New York Electrical Society, held in Columbia College Library in New York, February 24th, Mr. Willard E. Case, of Auburn, N. Y., read a paper upon a subject which seems to open almost indefinite possibilities of development in the future. At present, he said, we have only crossed the boundary line of this field, and it is hardly possible to estimate the results. His paper was on the "Production of Electricity from Carbon Without Heat or at a Low Temperature," and is, we believe, the first presentation of the subject. He referred to the experiments of Ritter as far back as 1801, and to the thermo-electric batteries constructed at a later date which produced electrical energy at a comparatively small cost. At present it is estimated that the generation of energy through heat involves a waste of not less than 75%. The extent of the loss may be estimated when it is said that all electricity produced for commercial purposes at the present time, except that obtained from water power, is derived ultimately from the consumption of carbon, usually in the form of coal.

A battery or cell consisting of plates of tin and platinum forming the electrode, immersed in a solution of chromic chloride, was shown. When the cell is heated the electrolyte becomes active and chlorine leaving the chromic chloride combines with the tin. This chemical action generates electricity and is continued until the tin plate is all converted. When the cell is cooled this combination is broken up and the chlorine returns to the chromium, while the tin falls as a metallic precipitate to the bottom of the cell in the form of crystals ready to renew the operation. The cell is a heat engine, a reversible voltaic cell which passes through a complete cycle; it must be heated to operate and cooled to regenerate itself.

A more practical battery of the same class was also shown which converted heat into electrical energy, consuming 2 $\frac{1}{2}$ ft. of gas per hour and generating 12 $\frac{1}{2}$ watts.

In the case of the galvanic battery, the waste through the different heat processes is done away with, but the zinc of the plates is so expensive as to make the method commercially impracticable as a substitute for steam. The cheapest materials which can be suggested are coal or carbon and the oxygen of the air, if they can be utilized. The main point has been to find a cheap substance which will act on coal and develop electrical currents, and whatever process is adopted must be as durable and as simple to use and handle as the steam boiler and dynamo at least. Many methods of producing electricity direct from carbon which have been tried were described, including the Bradley-Crocker cell, in which oxygen was obtained from fused sodium manganate, and allowed to act upon the coal in the same vessel. The electrolyte of this cell was caustic soda. The Jaques cell, which has been recently much discussed, was also referred to as an advance in this direction. But Mr. Case believed that another line must be taken up. He said that we have a wonderful example of the conversion of potential energy of carbon directly into work in the animal economy, which is developed at the expense of the oxidation of the material supplied by the food with an efficiency twice as economical as in the case of the steam engine. One-fifth of the potential energy is converted into work; four-fifths is converted into heat. But we must remember that the human body must be able to exist in the arctic regions as well as in the tropics, that the engine-room must always be kept warm, and to ensure this average temperature in all parts of the earth and under all conditions the four-fifths of what apparently is waste energy is necessary to maintain the race.

In the human economy the oxygen of the air is taken up by the blood in the lungs. It is carried through the arteries and attacks the tissues, giving up its oxygen, and so oxidizing them, and thus producing heat. When work is done, the equivalent of the heat disappears as work, and when work is not done, the temperature rises, perspiration and evaporation take place, and the temperature is kept at its normal condition through this safety valve. In other words, expressed electrically, there is local action as in a battery.

Observe in the first place that nature prepares the food which it consumes to perform its functions. The food is taken into the stomach and digested. A great part of it is useless—the best part is selected and is transformed into a condition in which it can be easily oxidized at a low temperature, the blood acting as the carrier of the oxygen. Does this not give us a hint that we should follow this course likewise, and prepare the material for our carbon-consuming batteries? The oxygen of the air we always have with us; so have we many carriers of oxygen, but no attempt has yet been made along this line, except that illuminating and other gases have been used.

To illustrate this subject Mr. Case showed a cell consisting of two electrodes, one of carbon surrounded by powdered carbon in a porous cup

and one of platinum, both being immersed in an electrolyte of sulphuric acid in a glass jar about 1 in. in diameter and 6 in in height. If we introduce into this electrolyte some chlorate of potash, peroxide of chlorine is formed, which decomposes; its oxygen attacking the carbon, oxidizes it without heat, the chlorine being set free at the platinum pole; electricity is generated with an electro-motive force of 1.3 volt, varying with the amount of the oxidizing agent and the kind of carbon. The action is perceptibly strong. This experiment would indicate that that there are more foot-pounds in a pound of carbon than has been generally supposed unless the additional energy in this instance comes from the chlorine peroxide. In this case we have a cell in which carbon is oxidized without the application of heat and at normal temperatures; in which oxygen in unstable composition is readily given up to the carbon, the product being carbonic acid gas, as proved by analysis. Mr. Case thinks, therefore, that he has the right to assume that a large proportion of the potential energy of the carbon is converted into electrical energy. The point is that we have in this cell conditions analogous to those taking place in the human system, at least to the extent that carbon is oxidized at the normal temperatures under which we live, and its potential energy converted into electricity.

In the human blood hæmoglobin is the carrier of oxygen, absorbing it through the lungs, and it has the power to oxidize carbon and hydrocarbon, as the body provides them without external heat. (To illustrate this, Mr. Case exhibited a very striking experiment in which electrical energy was produced by the oxidation of hæmoglobin in solution in water.) In conclusion he said: "What I want to express is this: In this battery carbon is completely oxidized at normal temperature by oxygen, which is held in loose combination. So it is done in the human body, and we know that to be a very efficient machine. Therefore I see no reason to think that it is necessary for us to use high temperatures. Keep without the second law of thermo-dynamics, search for a suitable carrier of oxygen or some cheap source of oxygen supply and hydrogen or carbon, or a carbon compound easily oxidized. Does it not seem logical that by following along this line and by preparing the material to be consumed, as nature does in the human body, we may yet be able to reach the desired end with economy? Is it not probable, judging from human experience, that within the wide range of materials some cheap means can be found?"

Mr. Case also said that the experiments so far had not been carried on at all on commercial lines, but on a purely scientific basis, but he believed in the possibility of a commercial solution in the future. The chemicals used in the experiments are too expensive for general use, and the object was to show that the potential energy of the carbon can be transformed into electricity without waste. The possibilities for the future are yet to be realized.

THE MINERAL PRODUCTION OF CANADA IN 1896.

We have received from the Geological Survey of Canada the advance statement of the mineral production of the Dominion for 1896. The statement is issued at an earlier date than in any previous year, a fact due to the efforts of Mr. L. L. Brophy, statistical assistant to the Survey.

The value of the total production is given as follows: Metallic, \$8,039,640; non-metallic, \$15,087,665; estimated for products not returned, \$500,000; total, \$23,627,305. This shows an increase of \$1,627,305 over 1895; of \$2,727,305 over 1894; and of no less than \$11,627,305 over 1886.

The quantities and values of the metallic products in 1896 were as follows:

	Quantity.	Value.
Gold.....	.....	\$2,519,206
Silver, oz.....	3,205,343	2,147,589
Nickel, lbs.....	3,500,000	1,155,000
Copper, lbs.....	9,385,556	1,021,148
Lead, lbs.....	24,199,977	721,384
Iron ore, tons.....	88,206	181,313

The increases shown in this list, as compared with 1895, were: Gold, \$899,306; silver, 1,429,660 oz.; copper, 596,394 lbs.; lead, 1,124,085 lbs. Nickel showed a decrease of 388,525 lbs., and iron ore of 14,591 tons. The gain in the precious metals, lead and copper was due to the British Columbia mines.

The most important of the non-metallic products is coal, of which 3,743,234 tons were mined, an increase of 229,738 tons over 1895; the gain coming entirely from the Nova Scotia mines, as British Columbia showed a decrease.

We hope to give the table in full in our next issue, and meantime congratulate our neighbor on the growth of her mineral industries as shown in this report.

BESSEMER STEEL PRODUCTION OF THE UNITED STATES.

The American Iron and Steel Association has completed its statistics of production of Bessemer steel in the United States in 1896, and they are this week published by Manager James M. Swank in the *Bulletin* of the Association. The figures include the complete production of Bessemer steel ingots and Bessemer steel rails in the United States, except the comparatively small quantity of standard rails and street rails which were made by manufacturers from purchased blooms. In the statistics of ingots produced are included the production of the few Clapp-Griffiths and Robert-Bessemer plants, and also the production of steel castings by all Bessemer works and the single Walrand-Legenisel plant at Chicago.

The total production of Bessemer steel ingots in 1896 showed a decrease from 1895 of 989,222 tons, or over 20 per cent. The production of 1895 was much the largest in our history. The following table gives our production of Bessemer steel ingots in the last ten years, in long tons:

Years,	Bessemer ingots	Years,	Bessemer ingots.
1887.....	2,936,033	1892.....	4,168,435
1888.....	2,511,161	1893.....	3,215,686
1889.....	2,930,204	1894.....	3,571,313
1890.....	3,688,871	1895.....	4,909,128
1891.....	3,247,417	1896.....	3,919,906

Notwithstanding the decrease, the output of 1896 was larger than that of any year previous to 1895, with the exception of 1892.

The following table gives the production of Bessemer steel ingots by States in the last four years in tons:

States.	1893.	1894.	1895.	1896.
Pennsylvania.....	2,126,220	2,334,548	2,378,924	2,292,814
Illinois.....	314,829	581,540	866,531	780,105
Ohio.....	318,141	363,974	719,954	568,535
Other States.....	426,496	291,251	343,719	278,452
Total.....	3,215,686	3,571,313	4,909,128	3,919,906

The following table shows the production by States of Bessemer steel rails for four years in long tons:

States.	1893.	1894.	1895.	1896.
Pennsylvania.....	639,431	606,866	837,043	663,086
Illinois.....	232,290	225,869	324,050	310,847
Other States.....	164,662	71,285	104,988	128,949
Total.....	1,036,383	904,020	1,266,081	1,102,882

The production of steel rails in 1892 was 1,458,732 tons, or greater than that of any year shown in the table. The growth of the steel production has been due chiefly to the application of steel to other uses.

THE RANDSBURG MINING DISTRICT, CALIFORNIA.

Written for the Engineering and Mining Journal by F. M. Endlich.

The Randsburg Mining District, located in Kern County, Cal., about 45 miles northwest of Mohave Station on the Southern Pacific Railway, and 26 miles north of Kramer Station, on the Atlantic & Pacific Railroad, has attracted marked attention of late. In two respects this new camp materially differs from many others. It has paid its own way thus far without the assistance of outside capital, and it has made no appreciable efforts to place its mines and prospects upon the market, nor has it sought to induce investments therein. Yet, to-day the town of Randsburg, with its suburbs of Johannesburg, Dutch Flat, Jerusalem Flat, Fiddlers' Gulch and other euphoniously named settlements, contain upward of 3,500 people, without counting about 1,200 more located in the neighborhood. Of this entire population of 3,300 not more than about 350 men are under pay at the various mines. From the very beginning, however, work upon the veins has paid and the camp has largely been developed by the immediate proceeds therefrom.

It is too early, as yet, considering the somewhat meager underground developments, to advance any definite opinion as to the detailed geologic and mineralogic characteristics of the metal-bearing formations and their valuable inclusions. It can only be said that the former, apart from the schistose rock which forms the bulk of the mountains, represent a highly metamorphosed series, more or less altered by thorough decomposition and by the intercalation or transverse irruption of porphyritic intrusions and dikes. Although the greatest depth thus far attained upon any vein is 150 ft., enough can be seen to show that marks of persistency and reasonable regularity of veins are not wanting.

Naturally the ores near the surface are decomposed—free milling—and it seems probable that this condition will persist to a depth of 200 to 250 ft. It can, however, even now be established that the main gold-bearer (silver occurs only in small quantities) has been and will be pyrite, although chalcocopyrite will probably partly replace this lower down. There is also reason to expect the occurrence of tellurides at greater depths. It is not likely that the quartzitic character of the ore will change nor that very heavy bodies of feriferous or cupriferous ores will be encountered. Down to the levels at present reached the gold is almost entirely free, but with continued work the ores will require concentration in addition to amalgamation and suitable treatment of the concentrates, if not, indeed, some leaching process for the entire output from certain veins. Meanwhile there are many thousands of tons amenable to treatment in the old-fashioned gold mill.

A brief synopsis of the leading properties now in operation, many of which were located less than a year ago, shows as follows:

The Rand Mining Company, composed of Messrs. Burcham, Moors, Singleton and Reddy, takes the lead, at present, in showing up quantities of ore. Its principal claims are the Olympus, Rand, Yellow Aster and Tribby, although the company owns 10 or 12 claims, partly placers, in addition thereto. It can truthfully be said that these four claims constitute a "mountain of gold-ore," reaching an elevation of 700 ft. (4,500 ft.) above the upper part of the camp (3,775 ft.). In value the ore ranges from \$5 per ton to several thousands. Well defined veins have determined the main locations, but the country-rock lying between them is literally impregnated with gold for thousands of feet. It would be foolish, with present exploitation, to ascribe any definite value to this rock, but all tests thus far made, seem to indicate that with a reasonably cheap method of treatment the entire mass could be profitably worked.

About 1,400 ft. of work has been done by the company, including a shaft about 150 ft. in depth. Ore shipments to mills and smelters have yielded returns as high as \$180 per ton, although the average grade of milling ore ranges from \$12 to \$30. About \$15,000 in shipments are credited to these mines. At present 10 claims of the group are under option, a three-quarter interest therein having been bonded for \$150,000.

The Butte Mining and Milling Company.—Messrs. Tate, Ramey, Summers and Stanton are the owners. Three of the company's claims have been systematically worked since last June, employing an average force of 25 to 30 men. At first the main vein was worked by means of an open cut, but now the company has five shafts ranging from 65 to 145 ft. in depth. The horizontal distance over which work extends on the same vein (reaching beyond the limits of this company's property) is but little short of 2,000 ft. The veins in this locality dip rather steeply in a northerly direction, but offer admirable facilities for exploitation by both tunnel and shaft.

Nearly all of the ores from these mines contain from 2 to 7 oz. of silver per ton. First-class ore runs, in gold, from \$120 to \$200; second-class

from \$20 to \$30 and the waste from \$8 to \$15 per ton. This classification will be considerably modified with the advent of suitable facilities for reduction. Thus far this group of mines has yielded, since June, 1896, between \$50,000 and \$60,000.

The Wedge Claim is a small fraction lying west of the Butte. Although it covers but a little more than 40 lin. ft. of the vein, it was sold for \$4,000 in October last and is said since then to have recouped its purchase price several times over. It is evidently on a pay chute of the vein and the ore is very rich besides forming a vein varying from 6 in. to 5 ft. in thickness.

The Good Hope and 400 (ordinarily known as the Kenyon) adjoins the Wedge and seems to contain the major portion of the rich chute. Mr. Kenyon and his son are working this unusually rich mine in a very leisurely manner. From the grass-roots down the ore has been rich, until now, at a depth of 105 ft. on the incline, the vein shows 12 feet of ore which averages \$90 per ton. Within the first 12 ft. down from the surface the shaft yielded 6 tons of ore which returned \$2,800 from the mill. Mr. Kenyon is not stopping, but resting tranquilly in the agreeable assurance that he can break down plenty of rich ore during any calendar-week in which he may elect so to do. The sorted ores from this mine readily run \$400, the first-class \$200 to \$250, the second-class \$60 to \$110, the ordinary milling-ore \$30 to \$50 and the waste \$10 to \$18 per ton. It is estimated that Mr. Kenyon has shipped about \$17,000 from his mine during the past six months.

Beyond the Kenyon this same vein runs into the Little Butte, but has not yet been properly opened on this claim.

The Black Hawk Mining Company comprises Messrs. Wilson and Kuffel, the Richards Estate and some quite recent owners. About 500 ft. of work has been done by the company on its group of 17 claims, and a number of shipments have been made, ranging in value from \$60 to \$120 per ton. About 1,600 tons of milling ore is broken, awaiting the erection of an efficient plant.

The Yucca Mine has recently come to the front as a prolific and rich producer. The ores run exceptionally high, even for Randsburg, and are milled by the owner, Mr. Koehn, at his mill on the Dry Lake, about 20 miles distant.

The Solomon Mine is one of a large number owned by Mr. Bull and the Ashford Brothers, three enterprising young Englishmen, whose patience, good judgment and strict attention to their own business have made them the possessors of a number of producing claims. Their deepest workings are down about 150 ft. and show neither a diminution of ores nor of values.

The Hawkeye, owned by Messrs. Fifield and Price, shows about 190 ft. of workings, with good ore of the usual grades.

The Napoleon, owned by Mr. Garlock, who operates an 8-stamp mill at Cow Wells, 10 miles distant from Randsburg, has been shipping ore worth from \$80 to \$140 per ton. Work on this claim has been so arranged as to admit of a heavy output at any time.

Messrs. Kelley & Richardson recently made a strike near the Olympus which netted them \$7,000 per ton in ton-lots. They have completed nearly 300 ft. of work with eminently satisfactory results. Their ordinary first-class ore runs \$600 to \$700, their average shipping ore about \$150 per ton.

The St. Elmo, owned by Messrs. Drouillard, Pyle and Burgwatt principally, is a somewhat unusual occurrence. In the open desert, about 6 miles east of Randsburg, one of the gentlemen was seated on a boulder, when he discovered that it contained innumerable cavities filled with gold. Systematic search uncovered a strong vein beneath sage-brush, sand and clay. The first 730 lbs. of ore shipped therefrom netted about \$1,400. Since then the first-class ore runs about \$600, the lowest grade about \$120 per ton. The ore is not decomposed, nor is it free-milling. The vein was evidently in the course of a glacier; the disintegrated rock was gradually scored off, and eventually the planed-off outcrop was covered with the typical products of the desert.

The Stine Gold Mining Company, consisting mainly of Los Angeles capitalists, Messrs. Lindenfeld, Ebinger, Ehrhardt, Stine and others, has utilized the abraiding, glacial action, and are working a series of placer mines immediately adjoining the St. Elmo mine. The gravel and dirt near the surface contain about \$2.60 gold per ton, and near bedrock show the amazing amount of \$16 per ton. Channe's are now being found which exceed even this latter figure. The company's expert, Mr. Gould, has made a new departure in working this ground. With a 15-H. P. gasoline engine he runs a rock-breaker of suitable construction, an appliance for separating boulders and a gang of dry washers. When in full operation this plant has a daily capacity of about 250 tons. Some slight difficulties had to be overcome, but the ultimate success of this novel arrangement is beyond question.

In and near Randsburg about 4,000 claims have been located. Of these 450 have been recorded and somewhat less than 120 are being worked with more or less vigor.

Randsburg suffers from lack of water and milling facilities. The nearest are 10 miles distant. It is expected, however, that during within a short time the Mojave Land, Water and Mining Company will develop water within 2 or 3 miles of the camp and promptly erect a mill of suitable construction. A conservative estimate places the net returns on Randsburg ores, from smelters and mills, since March, 1896, at about \$240,000, the ores on dumps at about \$200,000, and the ores ready to stope at about \$800,000 to \$1,000,000. Much of the ore is, of course, entirely worthless at present, but with proper milling facilities the camp could, to-day, easily furnish a supply of not less than 350 to 400 tons per day. Mining and other work is gradually assuming proper shape under the guidance of competent men, among whom may be prominently mentioned Mr. J. S. MacNeish, the well-known engineer of Colorado and Idaho. It will not be many months before the attention of capitalists will be drawn to this singularly self-reliant camp and then its progress will take care of itself as well as of those who cause it.

It is not too much to say that if a discovery like that of Randsburg had been made in Colorado, the district would now have 15,000 inhabitants, ample water-supply, mills, leaching works and all appurtenances of a flourishing "El Dorado."

Nevertheless, and in spite of the never-absent croaker, it is safe to say: "Randsburg has come to stay!"

THE BRADLEY ALUMINUM PATENTS.

In the *Journal* for February 20th, page 182, we referred to the decision of the United States Circuit Court of Appeals vesting in the Cowles Company the title to certain patents issued to Charles S. Bradley. This decision is final, as there is no further appeal possible in a case of this kind.

The patents in litigation were three in number: No. 464,933, issued as of date December 8th, 1891; No. 468,148, February 2d, 1892, and No. 473,866, April 12th, 1892. Of these the second, No. 468,148, is the most important, for the others cover very similar ground. As the matter is of importance in the aluminum manufacture, we give herewith two of the drawings accompanying the patent, and also an abstract of the specifications. The applications for these patents were made in 1888.

According to these, the invention relates to a process of effecting by the electric current the separation or disassociation of aluminum from its ores or compounds, or the decomposition in a similar manner of other like highly refractory metallic compounds of which aluminum may be considered a type. Hitherto this process has been carried on by subjecting the fused ore to the action of the current in a crucible or other refractory vessel placed in a heating-furnace where the temperature is sufficiently high to keep the ore in a melted condition; but the greatest difficulty is encountered in preventing the destruction of the crucible with this mode of working the process, for it has been found that, in the case of cryolite especially, which is a double fluoride of aluminum and sodium, the fused ore unites or fluxes with the crucible itself, and that the gas liberated in the process of reduction (fluorine gas) attacks the material of which the crucible is composed, and the consequence is that the crucible is quickly destroyed. This destructive fluxing action takes place to a greater or less extent in treating almost any material and is greatly aggravated by the fact that the crucible is subjected to heat from without, but even in the case of materials which do not exert a fluxing action the mere mechanical action of the external heat is sufficient to make it almost impossible to prevent

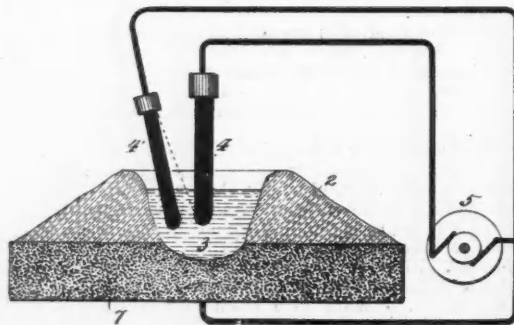


FIG. 1.

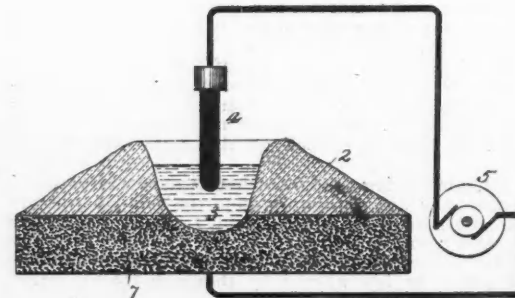


FIG. 2.

THE BRADLEY ALUMINUM PATENTS.

the cracking of the crucibles. The main object of the invention, therefore, is to dispense with the external application of heat to the ore in order to keep it fused. In order to accomplish this object an electric current of greater strength or intensity than what would be required to produce the electrolytic decomposition alone is used and the ore is maintained in a state of fusion by the heat developed by the passage of the current through the melted mass, so that the electric current is employed to perform two distinct functions, one of these being to keep the ore melted by having a portion of its electrical energy converted into heat by the electrical resistance offered by the fused ore, and the other being to effect the desired electrolytic decomposition, by which means the heat, being produced in the ore itself, is concentrated at exactly the point where it is required to keep the ore in a state of fusion.

Another feature of the invention consists in dispensing with the crucible for holding the ore and in employing a body of the ore itself to constitute the vessel or cell in which the reduction takes place, which is not destroyed by the chemical action of the fused ore and the gas liberated, and which therefore admits of the process being continuous, nothing being required but the charging of fresh ore as fast as the reduction goes on, either from without or from the sides or walls of the heap itself.

According to the description a body of the ore, more or less pulverized, is piled upon a hearth of any suitable material in the shape of a truncated cone, and a cavity or basin is excavated in the top of the heap to contain the fused portion of the ore which is to be treated electrolytically. In order to fuse the ore at the start, two electrodes of a suitable material, such as already used in like processes where fusion has been effected by an external furnace, are connected, respectively, to the two poles of a dynamo-electric machine or other source of current, brought first into contact, then separated sufficiently to produce an electric arc, and then thrust into the ore lying at the bottom of the cavity or basin, where the ore soon fuses by the heat of the arc and becomes a conducting electrolyte through which the current from the electrodes continues to flow. The arc of course ceases to exist as soon as there is a conducting-liquid—the fused ore—between the electrodes, and the passage of the current then takes place through the fused ore by conduction and the heat is produced as it is in an incandescent lamp. The arc is merely used to melt the ore in the beginning and the ore is kept melted by incandescence, so to speak, the metallic aluminum being gradually deposited at the cathode and the fluorine gas being set free at the anode so long as the ore is maintained in a state of fusion. As soon as the action is properly started the electrodes should be moved a little farther apart, in order that the metal set free at the cathode shall not form a short circuit between the electrodes or be attacked by the fluorine set free at the anode. For the purpose of perfectly managing and controlling the process, the electric generator or source of current is so arranged that the

strength of the electrolytic current may be properly regulated and the mass of ore thereby kept at the proper temperature. The most efficient way to accomplish this is to raise or lower the electro-motive force of the generator by any of the well-known methods employed—for example, in incandescent electric lighting.

It is evident that furnaces of various forms built of various materials may be employed without departing from the invention. Instances of two such modifications are illustrated in the drawings, Figs. 1 and 2, which are given. In Fig. 1 the body, 2, of ore is heaped upon a slab of carbon, 7, which is connected to one of the poles of the dynamo-electric machine, 5. The electrodes 4 and 4' are first brought together and inserted in the basin, 3, into the contained ore and then separated to form the arc, as previously described, and when the heat has melted down a portion of the ore so as to form a conductor, the electrode 4' may be withdrawn and the operation thereafter continued between the electrode 4 and the carbon slab 7. In Fig. 2 the arrangement is the same, except that the electrode 4' is omitted, and in this instance the operation is started by first establishing contact between the electrode 4 and the carbon slab 7, and then the former is withdrawn as soon as a sufficient quantity of fused ore is present to conduct the current and effect the required results.

The claims of this patent are as follows:

"1. The process of separating or dissociating metals from their highly refractory ores or compounds, non-conductors in an unfused state, of which the ores and compounds of aluminum are a type, which consists in fusing the refractory ore or compound progressively by a source of heat concentrated directly upon it rather than by an external furnace, and as it becomes fused effecting electrolysis by passing an electric current there through between terminals which are maintained in circuit with the fused bath, whereby the process is rendered continuous, substantially as set forth.

"2. The continuous process of separating or dissociating metals from aluminous or like highly refractory ores or compounds, non-conductors in an unfused state, which consists in progressively fusing the refractory

ore or compound and as it becomes fused electrolyzing it by passing an electric current therethrough of sufficient volume to continue and maintain the fusion and effect electrolysis and adding fresh material from time to time to preserve the bath constant, as set forth.

"3. The process of reducing metals from that class of highly refractory ores and compounds, non-conductors in an unfused state, of which the ores and compounds of aluminum are a type, which consists in fusing a portion of the refractory ore or compound to be treated, in establishing an electric current through said fused portion, and by such current producing simultaneously progressive fusion of such ore or compound and continuous electrolysis of the same as fused.

"4. The process of separating or dissociating aluminum from its ores or compounds, consisting in fusing and maintaining the fusion and electrolytically decomposing the ore or compound by the passage of the electric current therethrough, substantially as set forth.

"5. The continuous process of separating or dissociating aluminum from its ores or compounds, consisting in fusing and maintaining the fusion and electrolytically decomposing the ore or compound by the passage of the electric current therethrough and charging the bath with fresh quantities of the ore or compound as the reduction proceeds, substantially as set forth.

"6. The process of separating or dissociating aluminum from its ores or compounds, consisting in fusing and maintaining the fusion and electrolytically decomposing the ore or compound by the passage of the electric current therethrough and regulating the strength of said current in accordance with the requirements of the fused mass, substantially as set forth."

Iron Ore Trade in Belgium.—Belgium imported in 1896 a total of 2,056,567 metric tons of iron ore, an increase of 198,933 tons over 1895. The exports for 1896 were 383,931 tons. The imports were chiefly from France and Germany.

Coke From Peat.—According to the *Revue Industrielle*, a Norwegian chemist, Mr. Rosendahl, has succeeded in converting peat into a dense and compact fuel resembling coke. The peat is heated in retorts furnished with valves and the temperature is gradually brought up to 250° Cent. When this heat is reached the valves are closed and the temperature maintained for about seven hours. The tar and gas products are retained in the coke in this way. The yield is said to be about 80%, and the product shows about 65% carbon, 16% oxygen, 6% hydrogen, 3.7% water and 5% ash. The heat of combustion is about equivalent to that of a good quality of coal. The cost in Norway is said to be from 90c. to \$1 a metric ton. A company is to be formed in Norway to make this peat-coke.

THE ADVANTAGES OF PARTING DORÉ BULLION AT INDIVIDUAL WORKS.

Written for the Engineering and Mining Journal by Titus Ulke.

The advantages to refiners of parting their doré bars and selling fine bullion instead of doré bars, are as follows: 1. Remelting losses are avoided and secured more promptly. 2. The value realized is greater. 3. The cost of parting is considerably lower than the parting toll charged.

As the Moebius process is deemed the cheapest of all doré parting processes, it alone will be considered here, although parting by acid has almost as great advantages.

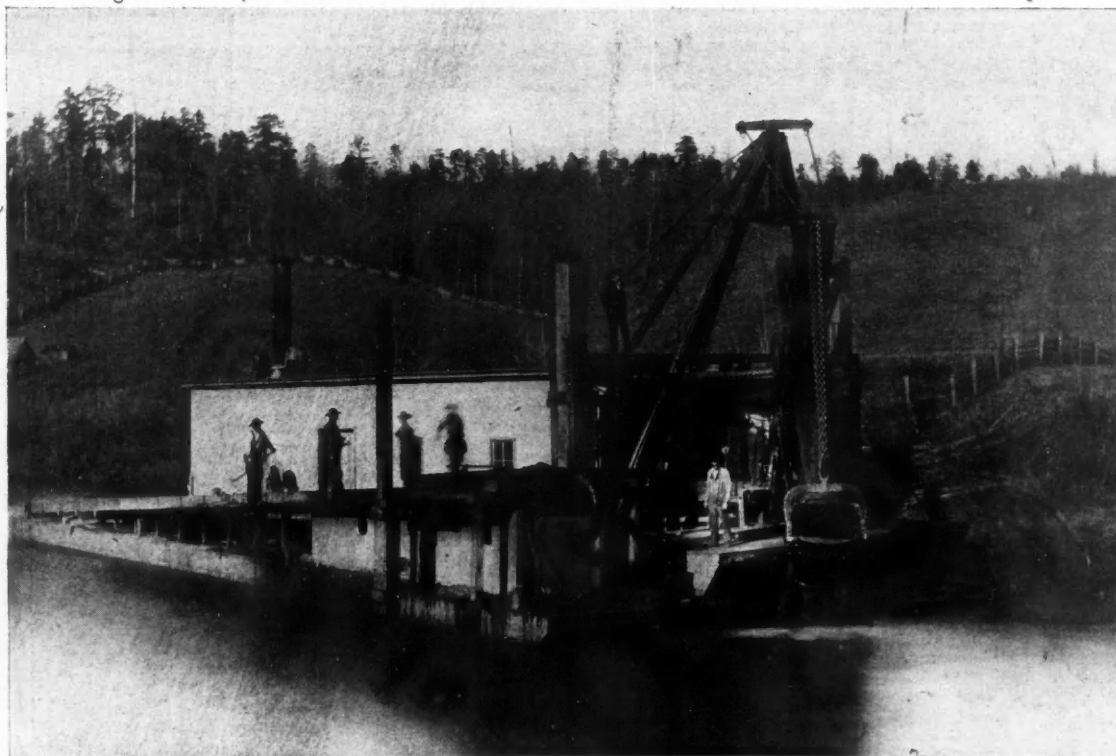
A Moebius installation for parting 30,000 oz. of 98% of doré bullion daily, and producing silver 999 fine and gold 990 fine can now be contracted for delivery at New York for less than \$8,000. The bullion can be parted in such a plant at guaranteed maximum cost of $\frac{1}{4}$ c. per ounce, exclusive of a royalty of 0.1c. per ounce, or a lump cash payment of \$10,000 for the use of the Moebius patent.

Custom refiners, to obtain a good sample for assay, remelt the bars shipped to them, and, after melting, report a net weight which is often considerably lower than the original bullion weight. The difference goes into slag, scrap and flue-dust. Such values lost to the shipper are largely recovered, if he parts his bullion in his own works. It is not customary,

DREDGING FOR GOLD IN SOUTHERN RIVER BEDS.

In the Dahlonega District in Georgia some effective work has been done from time to time in working the river beds for gold. In some cases the plan adopted has been to divert the course of the stream and then work over the dry bed, but this is usually too expensive a plan except with the smaller streams. The Chestatee River has been a favorite field of operations, and has usually given good returns, but it is at many points a difficult stream to operate in, owing to the fact that its bed is full of rocks and boulders and it is frequently interrupted by shoals and banks of hard slate. Messrs. T. N. and J. W. Birch have been working this field for some time and have decided that the best and most expeditious plan was to dredge up the gravel and other material from the river bed and pass it over or through suitable amalgamating apparatus to save the gold. To carry out this plan they went to the Marion Steam Shovel Company, at Marion, O., for the machinery needed.

The plant furnished consists of one of the company's Barnhart steam shovels mounted on a barge, and of a separate boat carrying the gold-saving apparatus. The first of the engravings herewith is a view of the plant in operation. The material taken up from the bottom of the river is jumped into the hopper of the sluice boat. The shovel is of the Marion



PLACER DREDGE BOAT ON THE CHESTATEE RIVER IN GEORGIA.

on the other hand, to remelt fine bullion for sampling, as is the case with doré bars received, and any loss in weight is therefore avoided.

Custom refiners never pay for less than whole tenths of a fineness on silver, nor for mere traces of gold. This item is certainly of consequence when many doré bars are shipped, as each bar is assayed separately, and the losses are, therefore, liable to be multiplied. The fractions of gold thus lost to the shipper are saved if he runs a parting plant, as the small quantities of gold difficult to assay correctly are then concentrated into a single bar.

Doré bullion can be parted at a total average cost of less than $\frac{1}{4}$ c. per ounce as against $\frac{1}{2}$ to $\frac{3}{4}$ c., the lowest toll at which refiners agree to part doré.

The rapidity of getting the metal in marketable shape is another advantage of such a parting plant. As it does not take over 3 to 4 days to secure fine bullion from the doré charge, and as fine bullion is practically paid for immediately after delivery and assay, the money can be obtained for this bullion in 4 to 5 days after charging. On the other hand, when doré bars are shipped, generally two weeks elapse before settlements are made.

Bog Iron Ore in Finland.—The Finland furnaces use chiefly the bog iron ore found in the province. The production of this ore does not seem to be increasing; in 1894 it was 68,244 tons, and in 1895 it was 65,818 tons, while for 1896 the output is estimated at 62,000 tons.

New Russian Manganese Deposits.—According to the London *Iron and Coal Trades Review*, considerable deposits have lately been developed in Jekaterinoslav, in Russia, in the form of pyrolusite. The ore is found at a depth of 6.4 to 32 m., of an average thickness of 1.42 m., while the maximum thickness is 2.49 m. The average content of manganese in the ore appears to be 44%, and the deposits are stated to be favorably placed for export. Indeed, a considerable business has already been opened up in supplying works in the South of Russia.

Company's usual construction, the dipper being made as nearly watertight as possible, so that in the time required to dump the load very little is lost.

The sluice boat is a barge 80 ft. long, and about 75 ft. is occupied by the hopper and sluiceway. The latter is of the usual form, the gravel passing through it slowly over riffles filled with quicksilver. The floor of the boat is of 3 in. plank, painted and tarred. The hopper is of $\frac{3}{4}$ -in. iron, set in a timber frame, and having an opening about 2 ft. wide into the sluice. In operation two men are placed on each side of the sluice to remove boulders or other obstructions. On some later plants designed by the Marion Company arrangements are provided by which it is possible to screen the material, after it has been washed to such an extent that any gold that might adhere to the boulders would be saved; after which, by a suitable grizzly, the boulders are kept from going through the sluices, and are carried off to one side and dumped out of the way.

The gold in the river bed is somewhat widely distributed so that it is necessary to work on a large scale to make the operation profitable. The greater part of the gold is free, but a little is coated or oxidized. In operation it has been found that practically all the free gold and a portion of the other is saved. Very little gold is found caught or amalgamated beyond the fourth riffle in the sluice, and it is the intention of Messrs. Birch hereafter not to clean up anything beyond the fourth riffle. When the sluice is worn out and has to be replaced, the boards will be burned up and whatever gold may be in the cracks or caught on bottom can be recovered from the ashes by panning.

Usually the excavation by the dredge is carried down to the hard stratum called bedrock, and then from 1 ft. to 2 ft. into this stratum, in order to get any gold that may settle. The depth cut out varies, the maximum being about 14 ft. below the bottom of the river.

The nature of the material encountered is illustrated by the second engraving, which is from a photograph of Mill Shoals, on the Chestatee River.

It takes to operate the plant illustrated four men on the sluice boat, four men for the dredge (an engineer, a crane-man, a fireman and a roustabout), these, with the night watchman, who completes the force

making nine men in all. The tailings are carried back and deposited in the excavation back of the dredge, so that in working the other portions of the stream it is not necessary to re-handle the material.

The operators, Messrs. T. N. and J. W. Birch, state that in several months of continuous operation they have found the plant both powerful and easily handled, and the breakage has been insignificant, having been confined to one sprocket-wheel. This is a remarkable record, considering the quantity of material handled, and its nature. The digging is practically all in either cement gravel deposits or hard slate, and there cannot be any work which will more severely test the different qualities of an excavating machine. They further state that the machine does the work well and rapidly, and unless they strike a solid bed of rock, they are able to handle any portion of the rough work.

MINING IN YAVAPAI COUNTY, ARIZONA.

Written for the Engineering and Mining Journal by John F. Blandy.

Yavapai County, in Arizona, is able to give a good account of itself for the year 1896. There have been improvements all along the line and especially in gold mining. If we look first at the Congress mine we find that there has been an increase of production over the previous year of about \$100,000. During the past year they added a cyanide plant for the

in slow process of development, as the prospector seldom has funds enough to do much work on his claim.

Three new mills are now in process of erection and several more are in contemplation as soon as the mines are sufficiently developed. Three mills have been running pretty regularly on mixed ores; that is, ores carrying gold and silver in connection with lead, zinc and copper.

In the *Journal* of January 23d there was an inquiry for argentiferous zinc-lead ores. Your correspondent says: "An examination of the sources of supply of such ores has caused me to conclude that, while ores may be abundant, it is still difficult to locate sources where the supply is in shape to be easily obtained in sufficient quantities." I would refer the writer to the Lynx Creek District, 12 miles from Prescott, and the Gladiator mine, in the Bradshaw District. Besides these, there are several other veins in the county. No one vein may at all parts of it supply the requisite amount of zinc or lead, but it should be no trouble to add enough of either to bring the whole lot up to standard. The probability would be that the lead would have to be added, and we should not have far to go to get the supply. These ores carry from \$10 to \$20 in gold and 12 to 60 oz. silver. The only question to be answered is, can such ores bear the cost of transportation to the point where they are wanted, or would they be treated on the spot? Furthermore, will the presence of iron sulphide and possibly 1% or 2% of copper be a detriment?

But two silver mines are being worked in Yavapai County, as they are only worked in a small way by chloriders. The production, although of very high grade, is not likely to affect the price of that metal. The United



MILL SHOALS ON THE CHESTATEE RIVER IN GEORGIA.

purpose of working the old tailing piles, which are very large, and lately they have been adding to its capacity. Besides they have added a roasting plant for the purpose of handling all the ore from the mine instead of shipping the concentrates to the smelters.

About four miles from the Congress mine is the Planet-Saturn. This mine has been opened in the last 18 months by about one mile of shafts and drifting, and an abundance of ore has been found to supply their new plant for some years to come. They have erected a large and complete plant for the treatment of ore, consisting of roller machinery and leaching vats by the cyanide process. The works got under way on January 1st and the last report from there is that all is working quite satisfactorily.

The next largest gold mine is the Crown King, in the Bradshaw District. They have largely increased the yield, making a return of something over \$20,000 per month. The condition of the mine has much improved, as the sinking of the main shaft to the 400-ft. level has shown the body of pay ore to have increased very much in length.

The Little Jessie has been working continuously and is paying off its debts at the rate of about \$5,000 per month. It is still producing the high grade of ore—assorted—which it has had from the beginning. Many tons have been shipped during the year which assayed 20 oz. per ton. At the McCabe they have still pursued the policy of opening the mine and are now 400 ft. down, with some thousands of feet of drifts. As all of this work has been paid for by the mine, it speaks well for the deposit.

These are the five leading gold mines of the county. To this list may be added the Placerite, which has worked a good part of the year and has paid well to the owner. All of the above are exclusively gold mines which have run continuously. Besides these there are 11 small mills which have run much on custom ore as well as that from the mines attached to the mills. They have not been running continuously, sometimes stopped for want of water and sometimes for want of ore. There has been about \$50,000 of gold from assorted ore sold by chloriders to the sampler. Many new and promising veins have been discovered and are

Verde is the only copper mine in the county, and as that is so well known to the public, it needs no comment.

There is general activity in every section of the county, and there are more visitors here seeking mines than was ever known in the county before. Altogether, the outlook for the future is better than ever before. A long spell of rainy weather causes great rejoicing among the placer miners, as they are assured of a bountiful supply of water for months to come. Their total production does not swell the public fund very much, but it is a big item to them. The hydraulic giant on Lynx Creek has been running for some time, handling 1,000 yds. per day, and the probabilities are that it will continue to work for some time. This is a longer campaign than it has ever had since it was established. In addition to this the company's amalgamator is handling about 1,000 cu. yds. daily. The yield of Yavapai County in gold for the year 1896 has been \$1,579,659, an increase of 25% over that of 1895.

Coal in Dalmatia.—Coal has been discovered in the Ruda Valley, near Sinj, in Dalmatia. Explorations have showed a seam from 1 to 1.5 meters thick, but broken up by bands of limestone. The coal is of very good quality, and a colliery is to be started.

Railroads in Russia.—Outside of the Siberian Railroad extensive improvements are to be made in Russian railroads. The Ministry of Ways of Communication intends to order this year 455 new locomotives, 300 passenger cars, 200 oil tank cars and 10,000 freight cars. About \$5,000,000 will be spent in building new branch lines.

Coal Trade of Austria-Hungary.—During 1896 the fuel imports of Austria-Hungary included 5,174,321 tons of coal, 19,981 tons of brown coal and 491,028 tons of coke. Exports included 658,367 tons of coal, 7,562,720 tons of brown coal and 116,607 tons of coke. The brown coal, or lignite, exported is from the Bohemian mines, and goes to Germany.

NEW SINGLE AND DOUBLE HOISTING ENGINES.

The accompanying illustration shows a hoisting engine of the semi-portable type, with double drums, built by the Webster, Camp & Lane Company, at Akron, O. It is of the same type as those used in mining; but the hoist shown in the engraving was built for use on the works of the Chicago Drainage Canal. The general design of the engines is similar to that of the hoists which the company has been building for years past; but these engines embody a number of improvements and represent the latest types of this very serviceable machine.

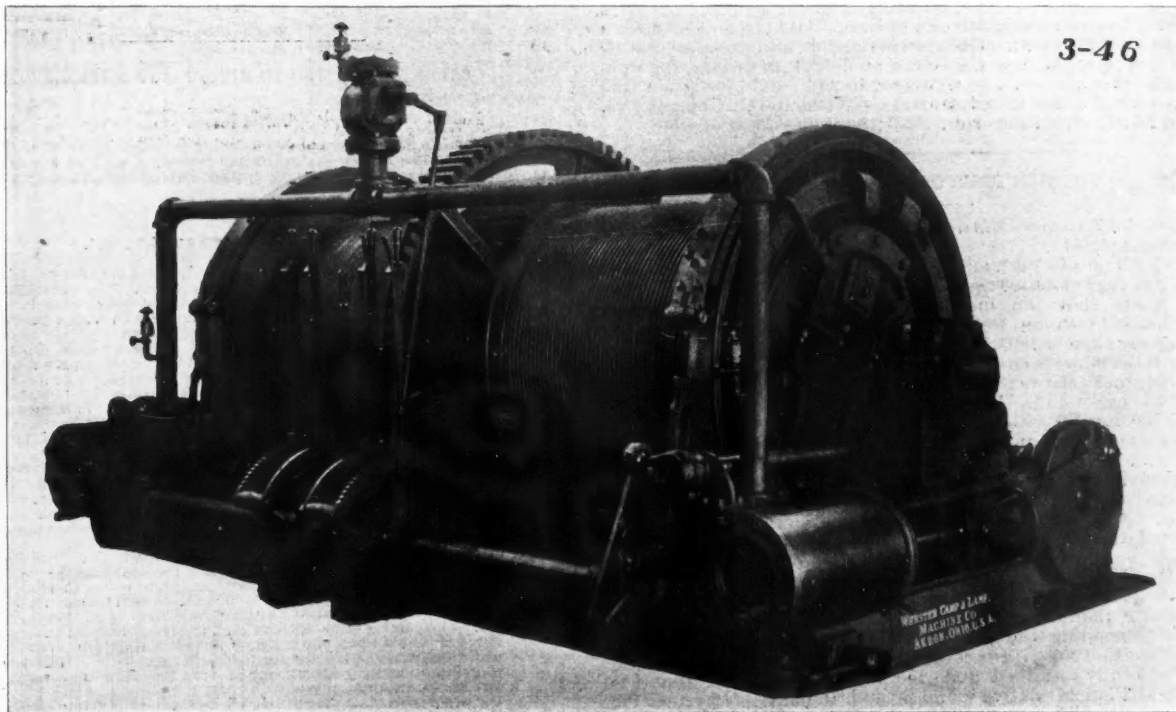
The engines are fitted with the company's band friction clutch, which is so well known throughout the mining world that no extended description is here necessary, there being over 2,000 of them now in use of various sizes, from 3 to 20 ft. in diameter. The illustrations show the details of this clutch very clearly. The drums are also fitted with powerful band brakes, both the clutches and brakes being operated by hand levers conveniently grouped in front of the machine. The drums are loose on the shaft and fitted with removable phosphor-bronze bushings, thus taking care of all wear without removing the drums from the shaft.

The engines are of heavy pattern with bored guides, and fitted for working pressures up to 100 lbs. The whole is mounted on a heavy cast frame or bed-plate requiring little or no special foundation, many of the plants in use on the Drainage Canal having no foundation but the timbers of the derricks. These engines are also largely used in mining enterprises and

the haulage cost, including interest on money invested in engines, maintenance and operation, varying from 1½c. to 3c. per ton-mile. The cost of hauling to the rope by animal and other mechanical power is included in the total cost of tail-rope haulage. The Nelsonville type of engine is in most common use. In several mines electric motors bring the coal to the rope, while in others horses are used for gathering. In these mines the length of haulage rarely exceeds one mile on each tail-rope engine, as the length of haul is limited by the size of the engines, a greater distance requiring greater speed or larger trips. As these latter conditions cannot always be met, there must in many instances be an adjunct to the tail-rope haulage. The trips vary from 30 to 50 cars each, the car and load averaging 3,000 lbs., and against grades varying from 1½ to 3%.

Towers and breakers are generally of wood, but a new plant, entirely of steel, has lately been erected at the Job's mine, near Nelsonville. The Mitchell automatic dumping tippie and the Nelsonville steam tippie are in common use. The latter has many excellent features, permitting a gradual dumping of the mine car, and an even distribution of the coal upon the screen. The two-flue boiler is the common type used.

There is considerable waste in these mines, most of them being surrounded by immense heaps of slack and bone coal, an 18-in. streak of bone being found in the center of this vein. The bed or vein of coal is overlaid by a bed of sand rock extending almost to the surface and giving an excellent working roof. Very little timber is required on the main and cross en-



DOUBLE DRUM HOIST FOR USE ON THE CHICAGO DRAINAGE CANAL.

are known as well built, substantial machines of best material and workmanship.

THE HOCKING VALLEY COAL REGION IN OHIO.

Written for the Engineering and Mining Journal by Our Special Correspondent.

The seam of coal here worked is Seam 6, Ohio Geological Survey. The vein varies from 6 to 12 ft. in thickness, and the coal is very hard, dull-looking and stands transportation quite well. The vein lying almost entirely above water-level, the mines are in most instances self-draining, the material being in every case attacked on the outcrop, and the expense of development being consequently much less than in other fields. All the coal is conveyed to market by the Columbus, Hocking Valley & Toledo Railroad, and there is an absence of the ruinous competition so prevalent in other fields, while among the miners and operators a better feeling prevails than in other districts.

The coal in the Hocking Valley is mined very cheaply. The vein worked lies under the hills and is worked to the outcrop. Royalty is paid by the ton, the prices prevailing being 10 and 12c. per ton. The mining plants, except in a few instances, do not represent large amounts of money, and the depreciation of mining property is not very great, while large daily outputs give low cost of production, the coal commanding the best market price for bituminous coal.

Room and pillar by double entry is the system of mining the coal. Nearly all the coal is mined by machine, both compressed air and electricity being used as motive power. The Jeffrey cutter-bar and Harrison percussive machines are the prevailing air-driven machines, while the Morgan-Gardner and Jeffrey chain cutters are the more common electrically-driven machines. The general plan followed in mining operations in the Hocking Valley is to drive an opening in each of two hills lying on each side of the valley, the tippie being built over the railroad in the valley beneath, and the coal mined in the two slopes being brought to the tippie by tail-rope haulage over a trestlework running horizontally from the slope entrance to the tippie. In one case the coal mined in four slopes is dumped over one tippie.

The tail-rope system of haulage is universal, and is here very efficient,

tries, only rooms being timbered. Rooms are turned at 50 ft. centers and are widened out to a total width of 30 ft., and driven to a depth of 200 or 300 ft. All pillars are robbed and fully 90% of the coal is won. The Harrison percussive machine is generally used for cutting pillars. The panel system should prove a success in this field were sufficient barrier pillars left.

Ventilation is, in most instances, by natural means, and in several slopes a small fan is used to accelerate the current. All old works are ventilated.

The coal in this field yields about 70% of lump and 30% of small coal, but the latter is of inferior quality and is rarely stored in bins. There are no shaking screens used in this field, the bar screen for lump coal and the revolving screen for small coal being most general.

Machine runners and helpers are paid by the ton, as are also the loaders. The price paid machine runners is 9c. per ton for narrow work and 6c. for wide work. Some of this coal is so hard that the steel cutters must be changed every alternate cutting. The number of cuttings per shift of nine hours varies from 30 to 40, depending on the hardness of the coal. After the coal is undermined by the machines it is customary to block off the lower 18 in. just above the mining, so that the coal can be loaded more easily, when it is blasted down.

These mines are surveyed very accurately and platted once during each month. The progress of the work is carefully watched by the engineers in charge, and no coal is left in the mine which can, with safety, be won.

Iron Production in Spain.—According to Senor Roman Oriol in the *Revista Minera*, the production of iron ore in Spain for the year 1896 was 6,808,000 metric tons, an increase of 1,293,671 tons, or 23.5% over 1895. The exports were 6,253,473 tons, a gain of 1,005,281 tons, or 19.2%. The production of pig iron in Spain was 246,326 metric tons in 1896, of which 23,805 tons were exported. The production of steel ingots was 104,577 tons, 62,511 tons being made by the Bessemer, and 42,066 by the open-hearth process. The total production of wrought iron and steel in bars, plates and other finished forms was 137,809 tons. There were seven steel and iron works in operation during 1896.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

WHEN OPTION ON PURCHASE OF MINE CANNOT BE REVOKED.—A contract provided that one who had made no payment should be allowed to enter into the possession of a mine owned by another, for the purpose of developing it. Such development contemplated the expenditure of money; the net proceeds of the ore extracted were to be turned over to the owner of the mine. The contract also gave the first party the privilege of purchasing the mine at a certain sum, payable on or before a certain time. In the event of a purchase the net proceeds of ore were to be credited on the purchase price. The Court held that there was a sufficient consideration, after the first party had entered upon the development of the property, to render the option of purchase irrevocable. —*Clarno vs. Grason* (46 Pacific Reporter); Supreme Court of Oregon.

MINING LEASES.—Where lands, and the oil and gas therein, were granted, demised and let in writing to a person and his assigns for the purpose, and with the exclusive right of drilling and operating for gas and oil for five years, and as much longer as gas or oil should be found in paying quantities, for a consideration of \$1 paid, and a promise to pay certain rentals for further delay if a default should be made in drilling a test well within one year, and it was provided that a failure to drill or pay the rentals should render the lease void as to both parties, the Court held that it was a lease of the land, oil and gas for the time and purposes specified, and not merely an option or a license. And the provision for a forfeiture was for the benefit of the owner and at his option, so that he was entitled to receive the rents specified on default in drilling the well; and the rentals as such could be recovered by him, and he was not limited to a recovery of unliquidated damages.—*Woodland Oil Company vs. Crawford* (44 Northeastern Reporter, 1093); Supreme Court of Ohio.

SULPHUR PRODUCTION IN SICILY.

According to the *Rassegna Mineraria* the exportation of sulphur from Sicily in long tons (2,240 lbs.) for the year 1896 was 396,745 tons as compared with 347,636 tons in 1895, and 328,930 tons in 1894. Notwithstanding the gain last year of 49,109 tons in the exports the stocks on hand at the shipping ports show an increase of 19,243 tons. These stocks amounted to 222,999 tons on December 31st, 1896, as compared with 203,756 tons at the close of 1895, and 198,513 tons at the close of 1894. As the consumption at home is comparatively nothing, a comparison of the exports and the stocks shows that the total production in 1896 was 415,988 tons. Of the exports the United States took last year 124,923 tons, a quantity which compares with 99,227 tons in 1895, and 105,773 tons in 1894. The average price at shipping port showed a considerable improvement; in 1894 it was 56.50 lire (\$10.85); and fell to 52.10 lire (\$10) in 1895, but in 1896 the effect of the combination of producers was shown, and the average rose to 68 lire (\$13.05) per ton.

Exports to all countries from Sicily showed an increase in 1896 with the exception of Great Britain, where there was a falling off of 2,000 tons. This was more than made up by an increase of 9,000 tons in the shipments to Sweden, Norway and Denmark.

In view of the facts given the *Rassegna Mineraria* thinks that several points deserve attention. In the first place there was a notable increase in stocks, notwithstanding the gain in exports. In the second place it seems to be shown that notwithstanding the increase in price, the American demand was fully sustained and even increased, showing that the predicted competition of native supplies and the use of pyrites for making sulphuric acid have not occurred. This tends to show that the producers need not be seriously alarmed over any supposed advantage in the employment of pyrites. Thirdly, the results of last year seem to prove that a very low price, which does not pay the producer, has little or no effect in extending the consumption of sulphur; on the contrary, this consumption has increased with a higher price. Finally, it appears that the mining crisis in Sicily was not due to over-production, but rather to competition among the producers which resulted in the excessively low prices. It seems to be established that the production will be absorbed by the demand at any reasonable figure.

Petroleum for British Gas Works.—According to the *Iron and Coal Trades Review*, the London gas companies have recently taken steps to make use of a large quantity of petroleum in lieu of coal for gas making. It is found that petroleum answers for gas making purposes quite as well as ordinary gas coal, and is both cleaner and more economical. The quantity of petroleum now consumed in London is very large—nearly twice what it was 10 years ago—and it is increasing every year.

A Traveling Gold Mill.—A correspondent in North Carolina writes that a "Metallurgical Car," a stamp mill, chlorination, cyanide and amalgamation plant combined, and fitted up on one car is in North Carolina, and like a bee will flit from place to place gathering good from the mines in different parts of the state. It came from Chicago and is in charge of Mr. E. W. Bowman, of that city. The object is to test gold mining properties with a view to purchase. The car can be side-tracked at any station on a railroad, and can be kept there as long as necessary.

Coal Production in Spain.—The production of coal in Spain for the full year is given by the *Revista Minera* as follows, in metric tons:

	1895.	1896.	Changes.
Coal.....	1,739,075	1,830,771	Inc. 91,696
Lignite.....	44,708	44,000	Dec. 8
Total.....	1,783,083	1,874,771	Inc. 91,688

Of the coal in 1896 the Asturias produced 1,122,700 tons; Cordoba, 304,000 tons; Palencia, 132,000 tons, and Ciudad Real 100,000 tons. Of lignite Baleares produced 18,000 tons and Barcelona 15,000 tons.

Russian Petroleum Exports.—The exports of oil from Russia during the year 1896 are reported as follows: Residuum and crude oil, 199,300 bbls.; lubricating oil, 726,200 bbls.; distillate, 846,700 bbls.; illuminating oils, 5,481,400 bbls., making a total of 7,253,600 bbls. Of this total Batum shipped 5,243,500 bbls., and Novorossisk the remainder. A Belgian company has been organized to develop the Grosni oil field on a more extensive scale. The work on the pipe line between Baku and Mikalovo, or half the distance between Baku and Batum, will commence as soon as the weather opens. Drilling operations are being pushed actively at Petrovsk.

Iron and Steel Imports in India.—The English papers are again somewhat disturbed over the extent to which Germany and Belgium are sending iron and steel to India. A recently published table shows the following change in the imports in 10 years, the quantities being given in tons:

	1885-86.	1895-96.
From Great Britain.....	178,919	159,502
" Belgium.....	8,635	115,713
" Germany.....	300	5,162
Totals.....	186,854	280,377

While the Indian imports have increased in 10 years by 51%, those from Great Britain have actually decreased. Belgium gained most, increasing its proportion of the total from 4.6% to 41.3%. The German imports are still small, but show a large relative gain.

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 FEBRUARY 16TH, 1897.

- 577,016. CONTINUOUS KILN. Friedrich D. T. Lehmann, Chicago, Ill. Assignor of one-half to Peter N. Kohlsaat, same place. The combination of a kiln, having a floor and removable walls and chimney or stack, a flue situated beneath the floor, openings in the floor with which the flue communicates, and dampers controlling the openings.
- 577,051. ACETYLENE-GAS GENERATOR. Charles Matthews, Jr., Chicago, Ill. The combination of a receiver for the solid, a liquid-supply tank, an inverted receptacle within the tank and communicating at or near its lower end with the tank, a supply-pipe projecting into the receptacle and communicating also with the receiver and means for holding and conducting the gas formed by the union of the liquid and solid.
- 577,060. MANUFACTURE OF ARTIFICIAL STONE. William Owen, London, England. The manufacture consists in confining the ingredients in a suitable mold, applying water-pressure to the outside of the mold, and then heating the mold by a heating medium having no direct access to the mold or water.
- 577,078. APPARATUS FOR HANDLING COAL. Ephraim Smith, West New Brighton, N. Y. The combination of an elevator, guides in which the elevator is mounted to slide, and bearings in which the guides are mounted to turn, the elevator being mounted to turn with the guides.
- 577,109. PUDDLING TOOL. Louis J. Morgan, Indianapolis, Ind. The combination of an upright tubular shaft with means for rotating the same, an inner-tube in the shaft with means for supplying water thereto, a horizontal, hollow stirring-bar or shell, all being kept cool by circulating water.
- 577,112. BLAST FURNACE-CHARGING APPARATUS. Marvin A. Neeland, Duquesne Pa. The combination with an inclined track leading to its top, of a carriage movable upon the track, a bucket supported upon the carriage, a sliding frame above the furnace arranged to be entered upon the carriage, and means for positively moving the slide in a vertical direction.
- 577,182. MANUFACTURE OF ALLOYS OF COPPER AND IRON. Aimé F. V. M. Baron, Paris, France. Assignor to the Baron Manufacturing Company, of New York. The process consists in subjecting the copper to heat until it becomes of a cherry or very bright red, and subsequently adding the required quantity of a mixture composed of a resin and oxalic acid, and finally adding the required quantity of iron.
- 577,186. PROCESS OF ELECTRO-DEPOSITING ALUMINUM. Caleb G. Collins, Woodburg, N. Y. Assignor to Calvin Amory Stevens, New York, N. Y. The process consists in passing an electric current successively through a positive solution containing a salt of aluminum, a porous partition and a negative solution containing potash and phosphate of aluminum.
- 577,192. CONVEYING APPARATUS. Thomas S. Miller, South Orange, N. J. The combination of a trackway, a load-carriage traveling thereon, a fall-rope hanging from the load-carriage and extending horizontally to an end of the span and two fall-rope supports below.
- 577,317. ELECTRIC FURNACE. Francis J. Patten, New York, N. Y. In an electric furnace two or more carbon pencils connected through independent electric circuits to a source of electric current, the circuits including a liquid commutator whereby the pencils can be given current singly and in groups successively in rotation.
- 577,331. MINING MACHINE. Reginald Stanley, Nuneaton, England. Patented in England September 13th, 1895, No. 14,348; in New South Wales June 27th, 1891, No. 3,082; in Queensland June 29, 1891, No. 1,363; in New Zealand July 6, 1891, No. 5,078; in Canada December 16th, 1891, No. 37,971, and in Germany, February 5th, 1892, No. 60,237. A machine with a rotary cutter, head, with means for holding the bed in position when the machine is at work.
- 577,370. ELECTRIC FURNACE. Francis J. Patten, New York, N. Y. The method consists in passing the material to be operated on between electrodes, subjecting the arc to the influence of a magnetic field whose lines of force are substantially transverse to the direction of the arc, and reciprocating the arc transversely to the path of the material.

Great Britain.

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

WEEK ENDING JANUARY 23D, 1897.

- 303 of 1896. C. C. Longridge and G. T. Holloway, London. Extracting gold from antimony ores, by making use of the greater affinity for gold of antimony metal than antimony ore.
- 317 of 1896. G. Love, Durham. In coke ovens, the use of large receptacles for receiving the coke, arranged so that they can be lifted bodily into water for quenching.
- 3,906 of 1896. W. Hampe and C. Schnabel, Clausthal, Germany. Making zinc oxide by heating sulphate with charcoal.
- 23,486 of 1896. F. G. Myers, Johannesburg. Machine for cutting and sharpening rock drills to any sectional shape.
- 26,281 of 1896. K. Klic, Lancaster. Electrodeposition of metal sheets in continuous strips.

PERSONAL.

MR. EDWARD FLORADA will continue as general manager of all the mining operations of the Oliver Mining Company, at both the Oliver and Mountain Iron mines, in Minnesota.

MR. J. G. A. LEISHMAN, who recently resigned his position as president of the Carnegie Steel Company, is understood to be a candidate for appointment as Minister of the United States to Switzerland.

MR. W. R. RUST, Manager of the Tacoma Smelter, has been visiting Rosslund, B. C., and making an investigation into the question of smelting low-grade ores. Mr. Rust is largely interested in Trail Creek properties.

MR. R. N. DICKMAN, of Dickman & Mackenzie, mining engineers and chemists, Chicago, has gone to Chihuahua, Mexico, where he will examine a mining property for Chicago people. Mr. Dickman will be absent three weeks.

HON. GEO. E. FOSTER, Ex-Minister of Finance for the Dominion of Canada, has been visiting the Trail Creek mines in British Columbia. It is understood that Mr. Foster has invested largely in Trail Creek, Boundary and Slocan properties.

MR. HURLBURT MAHON, who represents English capitalists who have invested largely in Boundary Creek properties, will leave shortly for England, on business connected with his investments. He will return to Rosslund, B. C., in June.

MR. F. D. STANLEY, civil and mechanical engineer of Spokane, Wash., has contracted with the International Mining Company to survey the placer and quartz claims owned by that company in and around Boundary on either side of the international boundary line.

PRINCE FEDOR SHADRIN, M. SHAGOLOFF and M. KRASLINSKOFF, Russians of note who own placer mines in the Russian possessions, are making a tour of the principal mining districts in California, for the purpose of examining the methods of the mine operators.

MR. E. GYBON SPILSBURY, manager of the Trenton Iron Company, has severed this connection and formed a partnership with Mr. CHARLES W. ROEPPER, of Bethlehem, Pa. The firm will be known as the E. G. Spilsbury Engineering Company, with offices in New York City, and will conduct civil, mining and engineering work.

MR. CHARLES BUTTERS, of Oakland, Cal., who recently returned from South Africa, started for the Transvaal on February 17th, his business interests there requiring personal attention. Mr. Butters has established an experimental station at Salt Lake City, and intends to establish another at Berkeley, Cal., on his return next year.

MR. FRANK A. BURNS, of Anaconda, has been appointed State boiler inspector. Mr. Burns is a native of Dubuque, Ia., 34 years old, and was educated at Cornell College, Iowa, and at the St. Louis University. The duties of the office are to examine boilers and to issue licenses to engineers. Mr. JAMES H. DALY, of Helena, is appointed deputy.

MR. H. A. GRAY, secretary and treasurer of the Illinois Steel Company, of Chicago, has accepted the position of controller of the Northern Pacific Railway Company, with headquarters at St. Paul. Mr. Gray has been connected with the Illinois Steel Company from the inception of the corporation. He was previously secretary and treasurer of the Union Steel Company.

PROF. JOSEPH LE CONTE, the veteran geologist, was given a public reception in San Francisco on the evening of February 18th, on the occasion of the fiftieth anniversary of his wedding. The reception was held at the Mark Hopkins Art Institute; the Governor of the State and his wife assisted Professor and Mrs. Le Conte in receiving the guests, and a gold cup was presented on behalf of many friends by President Kellogg, of the State University.

DR. WILLIAM B. PHILLIPS, who has been for four years past chief chemist of the Tennessee Coal, Iron and Railway Company, will retire from that position on March 1st, when the laboratory at Birmingham, Ala., will be almost closed, the force being reduced to one man, in consequence of a general reduction of expenses by the company, which in this respect is pursuing a most mistaken policy of economy. Dr. Phillips organized the laboratory and brought it up to a high degree of efficiency and usefulness, over 4,200 assays having been made there during a year, while many investigations and experiments were carried on, which were of great assistance in improving the company's work and its products. Prominent among these were the experiments on magnetic concentration of iron ores, which have been described by Dr. Phillips in our columns.

OBITUARY.

PATRICK MURPHY, the original owner of the townsite where Joplin, Mo., is, and half owner of the famous Empire mines near Joplin, died February 15th, after a brief illness.

THOMAS H. LEWIS, a well-known hydraulic engineer, and the contractor who built the reservoirs of

Hollidaysburg, Gaysport and County Home, Pa., died in Hollidaysburg, Pa., February 21st, aged 57 years. He was the president of the Aetna Mining Company, secretary of the Junata Canister Company, and was identified with other industrial plants.

CHRISTOPHER L. GRAFF, a well-known iron manufacturer of Pittsburg, Pa., died at his home at the East End on February 15th, in his 74th year. In 1852 he entered the firm of Everson, Freston & Company, whose mill was first in Soho and afterward at Scottsdale. He was also a member of the Scottdale Iron and Steel Company, and superintended the building of its mills.

THOMAS SAY SPEAKMAN died in Philadelphia February 18th, aged 80 years. He invented a drill capable of enlarging the bottom of a hole drilled in rock for blasting and disposed of it for \$10,000. Among his other inventions were a ship disinfectant; a gauge to enable a captain while sitting in his cabin to ascertain the depth of water in the hold of a vessel; a ventilator for halls and mines, and a process for consuming smoke in furnace, locomotive and other stacks. Retiring from business he devoted his entire attention to the pursuit of scientific researches and experiments, having as many as 150 experiments in progress at one time. His plan of drainage was authorized by the legislature of New Jersey and proved successful. Mr. Speakman was the originator of a plan for bridging the Delaware by the erection of a structure 120 ft. above high water, with two draws 380 ft. apart, one of which was always to be open. As soon as a vessel passed through one it closed and the other opened. The proposed cost was \$2,000,000.

SOCIETIES AND TECHNICAL SCHOOLS.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—By arrangement with the Faculty of Applied Science, McGill University, a series of seven lectures on the Transmission of Power will be delivered in the rooms of the society, at 112 Mansfield street, Montreal, from 8 to 9 p. m. on Thursday evenings, commencing Thursday, February 18th. The first lecture of the series was delivered at McGill University on February 12th. The programme of lectures is as follows: Lectures 2 to 4, "The Transmission of Power by Compressed Air," by Professor Nicolson; lecture 5, "Thermal Storage and the Distribution of Power by Steam," by Professor Durley; lecture 6, "The Transmission of Power by Gas," by Professor Nicolson; lectures 7 and 8, "The Transmission of Power by Wire Ropes," by Professor Durley.

ENGINEERS' CLUB OF ST. LOUIS, MO.—The 449th meeting was held February 16th at 1600 Lucas place. Mr. J. L. Van Ornum read a paper entitled "Some Water Supplies of Southern California." The peculiar geographical and physical conditions of Southern California were briefly reviewed, and the methods of procuring water for irrigation and for the use of cities and towns were described. Although artesian wells and dams are often employed for the purpose of collecting water, the peculiarity of the region is the very extensive use of tunnels driven in the detritus, parallel to the course of the mountain streams. Numerous examples of the various methods were given.

MONTANA SOCIETY OF ENGINEERS.—A meeting was held February 13th, 1897, in Helena. Mr. M. S. Parker, the engineer in the construction of the Black Eagle Falls Dam, gave, by request, quite a full description of the dam, power-houses, Boston & Montana Company's smelter and electrolytic refinery and nature's works, visited by the society. Referring to the dam he stated that the original height of the falls was 25 ft. Present head, with dam, 43 ft.; flow of water at minimum stage, about 4,000 cu. ft. per second. About 20,000 H. P. could be generated by the present development. There is now being used about 10,000 H. P., of which the Boston & Montana Company uses about three-fourths.

An amendment to the constitution was carried which changes the name of "The Montana Society of Civil Engineers" by eliminating the word "Civil."

INDUSTRIAL NOTES.

The Cornwall and North Cornwall iron furnaces near Lebanon, Pa., may resume in the near future, giving employment to upward of 1,000 men. The furnaces have been idle for a long time.

The Bethlehem Iron Company on February 19th shipped to Sebastopol, Russia, 25 turret plates made by the company for the Russian battle-ship *Rostislav*. The plates are 10 in. thick and weigh 528 $\frac{3}{4}$ tons.

The Reading Tin Plate Company, of Reading, Pa., recently elected the following officers: Howard L. Mollvain, president; Lewis Crater, secretary and treasurer; Charles A. High, general manager, and Walter L. Young, solicitor.

The Spearman Iron Company, incorporated, of Sharpville, Pa., at the annual meeting of stock holders, elected Joseph Forker president, John Phillips and Walter Pierce vice-presidents, J. J. Spearman treasurer and general manager, and M. H. Henderson secretary.

The Reading (Pa.) Iron Company posted a notice in the works on February 20th, that the business situation compels a decrease in the cost of production, and that this involves a reduction in wages. The readjustment will go into effect March 1st. About 2,500 men are affected.

The Monongahela Tin Plate Company, of Pittsburg, Pa., recently purchased the tinning plant of the Duquesne Tin Plate Company, of the same city. The Duquesne plant is to be improved so as to enable it to tin the whole of the product of the Monongahela Company's nine black plate mills.

The Central Brick Coal Company of New York City was incorporated last week to own a secret process for cementing pulverized or fine coal or coal-dust, and to manufacture pulverized or fine coal or coal-dust into bricks or lumps; capital, \$25,000, and directors, Cyrus A. Dodd, William B. Squire, Henry Rice, of New York, and Glenn I. Folsom, of Philadelphia.

The Pacific & Arctic Railway and Navigation Company has filed articles of incorporation at Seattle, Wash. The new concern is to build a pioneer railroad in Alaska, with a capital stock of \$1,000,000. Its proposed route crosses Chilkat Pass, which will do away with the greatest hardship incident to the trip into the Yukon. It is also proposed to run boats on Summit Lake and the upper portions of the Yukon, so that passengers and supplies can be carried to the gold-mining regions.

The Nichols Chemical Company, operating the Albert pyrites mines and the chemical and fertilizer works at Capelton, Canada, is being reorganized, a charter under Dominion Statutes being applied for. The new company will be known as the Nichols Chemical Company, of Canada, and the authorized capital is \$25,000. The directors of the reorganized company are: W. H. Nichols, W. H. Nichols, Jr., and J. H. Bagg, New York; S. L. Spafford, Capelton; A. W. Elkins, Capelton; S. L. Clough and W. B. Pritchard, of the Township of Ascot, Quebec.

TRADE CATALOGUES.

The American Steam Gauge Company, Boston Mass., in the latest edition of its catalogue calls especial attention to its apparatus for calibrating indicator springs. The old method was to test these springs by dead-weight while cold, which with low-pressure steam was sufficiently accurate for all practical purposes. High-pressure and high-grade compound and triple-expansion engines have made greater accuracy necessary. Heat weakens the spring, so that the scale is not the same while hot as while cold, and leakage past the indicator has a perceptible effect which cannot be allowed for when testing by dead weight. The apparatus which they have perfected is modeled after the one at the Brooklyn Navy Yards, with such improvements as the engineers there could suggest, and was constructed by the most able men in a thoroughly scientific manner. The method of testing the indicators is as follows: Several are put on the testing apparatus together and connected up to an electrical apparatus which is so arranged as to put the pencil on and rotate the paper drum whenever the circuit is closed. At intervals on the mercury column, corresponding to equal differences of pressure, contact points are inserted, so that when the mercury rises, as steam is admitted to the apparatus, it makes contact at these several points, completes the circuit, and draws a line on the indicator paper. After testing in this manner for rising pressure, the pressure is let off and the apparatus set that the breaking of contact puts on the pencil and draws the line. A test diagram is thus drawn automatically by the mercury column itself, without the possibility of human error.

The extreme care with which the company perfects indicators is bestowed also upon the various other manufactures which it produces, which include safety and relief valves, speed indicators, water cocks, gauge cocks, Seth Thomas and Howard clocks, and all kinds of steamship instruments.

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 manufactures in each line.

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

GENERAL MINING NEWS.

ALASKA.

ALASKA MEXICAN GOLD MINING COMPANY.—This company reports the clean-up for the month of January, 1897, as follows: Period since last return, 31 days; bullion shipment, \$26,964; ore milled, 11,973 tons; sulphurets treated, 211 tons; of bullion there came from sulphurets, \$8,192; working expenses for period, \$19,452.

PORTLAND ALASKA GOLD MINING COMPANY.—The object of this company, which was recently in-

corporated, is to develop mining properties in Alaska, and more especially the Mexican and Horrible lodes near Berners Bay. The company will construct and equip a railroad, wagon road, tramways and wharves, and connect Berners Bay with the shore line of Lynn Canal. The capital stock of the company is \$500,000. The incorporators are A. Neppach, A. N. Pettit and George H. Pettinger.

ARIZONA.

YAVAPAI COUNTY.

ETTA.—This mine continues to turn out good ore. The shaft is down 200 ft., and the tunnel is 300 ft. in. The Etta mill will resume operations at once, after being shut down for a year.

GOLD RING.—An extensive and rich body of free milling ore is reported to have been recently uncovered in this mine. The shaft is down 160 ft.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

AMERICAN.—The development work at this mine, 6 miles east of Sutter Creek, has exposed a ledge from 7-ft. to 12 ft. in width at a depth of 60 ft. A drift has been run on the ledge for 200 ft. The assays average about \$10 per ton.

ARGONAUT.—This mine is located 1 mile north of Jackson. The cleanup of the 500 tons of ore crushed at the Zeile mill realized \$9.35 in gold and \$1.61 id sulphurets per ton, which is considered a very good showing. Arrangements are being made to erect a 40-stamp mill.

KENNEDY.—At this mine, 1 mile from Jackson, the ledge struck at the 2,250-ft. level is reported to be over 70 ft. in width, and will mill over \$15 per ton.

LOMBARD.—This mine, about $1\frac{1}{2}$ miles from Pine Grove, has a shaft down 40 ft. The ore is being crushed at the rate of 15 tons per day, and yields about \$10 per ton.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

EDNA.—It is reported that this mine, near Spring Gulch, about three miles north of San Andreas, has been sold to Chicago parties for \$85,000; that the shaft will be enlarged to a three-compartment shaft, and sinking resumed down to the 1,000-ft. level.

GWIN.—At this mine, four miles southwest of Mokelumne Hill, the inclined shaft is down 1,446 ft. vertically. One stope has been started at the north end of the 1,200-ft. level, and appraisals are better made and levels opened. The 40-stamp mill is working on ore taken out of the shaft. The ore which is now being worked is giving satisfaction to the owners.

INFERNAL.—This drift mine is $3\frac{1}{2}$ miles southeast of Mokelumne Hill, on the Tunnel Ridge channel. Only development work is being done at present, but a 20 days' run yielded over \$1,200. Six men are employed.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

MARIPOSA GRANT.—The sixth interest owned in this property by Alvinza Hayward was sold to the London Exploration Company for \$166,666, the title being placed in the name of Hamilton Smith. The remaining interests are held by the Hobart Estate, John W. Mackay, John P. Jones and Samuel Jones. The Mariposa Grant comprises 44,000 acres, the most important mines being the Pine Tree, Josephine, Princeton, Mariposa, Mount Ophir, Lewis, Georgiana Ludwig and Texas mines. These mines are all supposed to be located on the Mother Lode and are known to be rich, but very little work has been done in the way of development. The only largely developed mines are the Josephine and Pine Tree. It is supposed to be the intention of the Exploration Company, of London, when it has secured control of the property, to thoroughly develop and work the mines.

NEVADA COUNTY.

(From Our Special Correspondent.)

MERRIMAC.—This mine, 2 miles northeast of Grass Valley, is still idle. Col. George Stone, of San Francisco, has made the second payment on the purchase price, and he intends to commence operations on a large scale in the spring.

NORTH STAR.—At this mine, 2 miles south of Grass Valley, the late storm caused the water to rise rapidly, and the 2,000-ft. level has been submerged, and quite a number of tributaries have been obliged to stop work. There is danger that the mine will fill up to the 1,500 ft. level before the broken crown wheel can be replaced.

PLACER COUNTY.

(From Our Special Correspondent.)

GOLDEN RIVER.—This mine, formerly known as the Red Point, located $1\frac{1}{2}$ miles southeast of Damascus, has advanced the breasts up the channel over 2,000 ft. during the past year, making the total length of the tunnel about 10,000 ft. Ventilation is secured by means of a blower run by water power. Sixty men are at work under the superintendency of C. F. Hoffman.

MAYFLOWER.—Arrangements are being made to build a ditch 12 miles long, to take water from Shirt Tail Canyon. This will give them 1,000 miner's

inches, the ditch being 150 ft. higher than the old one. The cost for this work will be about \$8,000. Drifting is being carried on in both the old Mayflower and the Oronochannels. Prospecting is being done to find an upper lead above the Mayflower channel. The gravel averages over \$2.50 per ton. Seventy-five men are employed. This property is located 3 miles north of Forest Hill.

SAN DIEGO COUNTY.

PICACHO GOLD MINES.—Samuel B. Morgan, of Denver, president of these mines, located in the old Picacho District, has gone to New York City for the purpose of closing the sale of this property to an English syndicate.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

BONANZA.—This pocket mine, in Sonora, abandoned some years ago, is to be re-opened under the management of the Wilman Brothers. A new Pelton wheel is to be put in to furnish power to an air compressor, which has a capacity of 6 drills. The Cornish pump will be run by steam. This mine has produced in the neighborhood of \$2,000,000 since it was opened in 1850.

GAGNERE.—This mine, at Tutletown, which was worked about 40 years ago, has been re-opened by W. G. Long. The shaft is down 330 ft., and on the 100 and 200-ft. levels there is estimated to be over 25,000 tons of pay ore in sight. Arrangements are being made to erect a 20-stamp mill.

GERRYMANDER.—This mine, located about one mile southwest of Sonora, adjoining the Golden Gate mine, is being developed, and in a short time the main vein will be tapped about 140 ft. from the surface. The 5-stamp mill is kept busy on the vein matter encountered as the development work progresses.

MAMMOTH.—At this mine, $\frac{1}{2}$ mile north of Jacksonville, the pay streak on the 700-ft. level, takes in about 6 ft. of vein matter, which is said to be very rich. Several sections of the flume were recently carried away by a freshet, and the mill was obliged to shut down for several days.

NORWEGIAN.—At this mine, near Robinson's Ferry, a rich vein 5 ft. wide has been struck in the drift from the bottom of the shaft, which is down about 70 ft. Frank Enzensberger is general manager.

COLORADO.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

BELLEVUE-HUDSON.—The shaft on this mine, at Lawson, has been sunk for 400 ft. and another lift of 100 ft. is being commenced. It is producing heavily, with values running in silver.

CASHIER MINING COMPANY.—Since the consolidation of the Cashier mine, at Empire, with the Mint, the Eastern people have been opening up both properties through one set of crosscut workings. The Mint vein has just been cut, with a small body of ore reported to run 8 oz. gold per ton.

CORRY MINING COMPANY.—The Diamond tunnel of this property, at Silver Plume, has been driven for 2,760 ft., at the breast of which a promising vein of ore has been cut. In the mine proper four levels are being driven to open up new ore bodies and several stopes and drifts are now producing ore.

GENERAL THOMAS.—Mrs. M. A. Allen, of Idaho Springs, is attempting to form a consolidation of the various mines on this lode, and if successful she will assume charge of the group. The lode is producing a very heavy tonnage of rich ore and Mrs. Allen has been making good money from the General Thomas. The first class runs \$150 and the second class \$67 per ton. The mines are mostly owned by private individuals living in the East.

GOLD DIRT.—While there is a deal on for the consolidation of this property with the Tenth Legion holdings at Empire, the interested parties claim that the consummation of the deal is some distance away, notwithstanding general newspaper rumors. If completed it will be a most important transaction.

INDEPENDENCE.—Two tunnels are being driven for this lode above Georgetown; one is in 400 ft. and the other 150 ft., the former being expected to cut the lode almost any day. The record on the lode is a production of \$100,000, mostly silver.

EAGLE COUNTY.

CASTLE GOLD MINING COMPANY.—H. D. Williamson, manager of this company, of Quincy, Ill., has let a 60-ft. contract in the tunnel which is being driven to tap the Squaw vein, where it is expected a large body of ore will be opened up that crops at the surface. The Democrat, owned and managed by the same parties, is being developed by a tunnel, a 100-ft. contract having just been completed. Another contract will be let and development work continued all winter.

LITTLE GOLD DUST MINING AND MILLING COMPANY.—The shaft is now down 100 ft. in the Little Gold Dust mine owned by this company, of which Mr. O. W. Daggett is manager, and shows a 3-ft. streak of good free-milling gold ore that assays from \$20 to \$150 per ton, says the *Examiner*. Another contract will be let to drive levels both ways from the shaft and also to sink the shaft to a greater depth.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

ACACIA MINING COMPANY.—This company, formerly the Calumet, owning the Burns claim, adjoining and paralleling the side lines of the Pharmacist and the Morning Star and end lines with the Buena Vista claim of the Isabella Company, held the annual meeting on February 15th, when Dr. Chambers was appointed vice-president and general manager. The claims are now largely worked by lessees, who only spasmodically ship low-grade ore. Both claims are in good territory and have shipped about \$20,000 worth of ore.

ANACONDA.—This property, on Gold Hill, during the month of January was not a very prolific shipper, receiving returns for only \$9,500. The public, in spite of the way the stocks are being manipulated, have confidence in the mine.

ANCHORIA-LELAND.—The shipments for February are estimated at nearly 700 tons of 3-oz. ore. The first level, 287 ft. deep, is yielding well, considering that the lessees were supposed to gouge the property pretty thoroughly. The shaft has reached a depth of 750 ft. and a station has been cut at that point.

ARCADIA CONSOLIDATED MINING COMPANY.—This company, owning and working the Lone Star, No. 3, in Poverty Gulch, gives employment to 48 men, who are mining about 200 tons of fairly good graded ore each month. The shaft has been sunk 275 ft., and about 200 gals. of water is being pumped each minute.

BEACON HILL.—The past four weeks have produced a great change on the east slope. Prospectors can be counted by the score, prospect holes by the hundreds and trenching or costeaning by the yard, shaft houses by the dozen. From one point could be seen eight platforms on which ore was being placed, and the deepest shaft less than 60 ft., the majority of them being less than 25 ft. deep. The Lanterman lease, for which \$15,000 was paid, has a length of 60 ft. on the vein, and already yielded over \$13,000 per ton, is sinking a shaft vertically by 12 men, the vein having ripped north, or into the hill. Mr. Lindsey, the Cashier of the First National Bank, has a shaft 40 ft. deep from which 10 tons of ore per day is sent to the smelter of an average grade of \$47, hoisted with an Armstrong whim. The vein is fully 8 ft. wide. Parker & Boaden Lease, on Block 18, just shipped a carload of selected ore of a supposed value of over \$100 per ton. The Gold Dollar claim, south of the above leases; also made a recent strike of rich ore at a depth of 11 ft. Three assays were shown from the seam, showing 78.83 and 92 oz. of gold per ton. This claim is largely owned by a Mr. Goff, of Rhode Island, Bennett & Myers, of Denver, and Dr. Whiting, of Cripple Creek. The vein was supposed to have a north and south course, but recent developments favor the course to be parallel with the contour of the hill.

BLUE BIRD.—This mine, on Bull Hill, was recently worked by the owners under the superintendency of Mr. Barrett, who formerly leased the north end of the claim, who has already shipped two cars of 8-oz. ore. This mine has never paid lessees.

CHRISTMAS MINING COMPANY.—The property on Bull Hill has not yet resumed work, but expects to do so shortly, the employees having all been paid, and the rumor that the claim is to be let in blocks to lessees is almost again abandoned. The ore chute was lost from the 175-ft. to the 235-ft. level, both in the shaft and the winze, and the company will in all likelihood work this mine as before.

OPHIR MINING COMPANY.—The Dead Pine, on Battle Mountain, owned by this company, is being worked under lease and bond by Dennis Sullivan and others, of Denver. The shaft has been sunk 500 ft., and about two cars of ore each week is hoisted from the 400 and 500-ft. level.

ST. LOUIS TUNNEL COMPANY.—This company is operating in Spring Creek, and has driven its tunnel by machine drills 170 ft. through a hard granite, composed of large red felspar crystals and quartz, very coarse grained, with seams of micaceous iron on the joints. The size of tunnel is 7 ft. x 8 ft. in the clear. The course of tunnel is northeast, through Little Tenderfoot Hill. St. Louis people are furnishing the capital for this scheme.

GILPIN COUNTY.

(From Our Special Correspondent.)

CROWN POINT & VIRGINIA.—A raise put up from the crosscut has holed through into the Williams' shaft, thus establishing the accuracy of the theory advanced on behalf of this mine in the recent litigation with the owners of the parallel Rio Grande claim, to the effect that the Rio Grande dipped into the Williams in depth, in which case the Williams, as the older claim, would carry the title to the downward extension. Meantime, the Crown Point property is advertised for sheriff's sale by auction at Georgetown, to satisfy its numerous creditors in Gilpin and Clear Creek counties.

EAST CENTENNIAL.—Eastern parties have taken a lease and bond on this claim, in Chase Gulch, and have visited a shaft-house and small hoisting plant. The shaft, now 130 ft. deep, is being sunk deeper.

GALENA.—The shaft-house on this property was wrecked by a boiler explosion a few days ago. The damage is being repaired with all possible speed, and it is hoped that everything will be in good shape in a couple of weeks.

GREGORY BOBTAIL.—Good progress is being made with unwatering this property, the water in the incline now standing well below the 800-ft. level. This is being done with steam from three boilers only, whereas a few weeks ago it required hard steaming with six boilers to merely hold the water, the difference being caused mainly by the simple and obvious means of properly clothing the steam pipe in the incline.

KANSAS.—The water has all been taken out to the bottom (1,350-ft.) level, and it is understood that sinking will shortly be commenced.

U. S. M.—This mine, near the Buell, has been taken up on lease and bond by Eastern parties, who have hoisted out the water, and are repairing the shaft, 250 ft. deep.

GUNNISON COUNTY.

PINK.—The owners of Carpenter lode are putting in a steam hoist and an air compressor to work the shaft of this lode. They intend to sink at once 220 ft. to reach a depth of 300 ft. The machinery is now in place for the 1,800-ft. tunnel.

VENABLE.—This property is being worked at present by cross-cutting at the bottom of a 91-ft. shaft. The crosscut is in now 24 ft. and shows up 20 ft. of ore. Recently, while crosscutting the vein, a quartz carrying white iron was encountered showing free gold all through.

LAKE COUNTY.

(From Our Special Correspondent.)

CADY MINING COMPANY.—This company has filed articles of incorporation in Denver and Leadville. The capital stock is \$1,200,000, and Charles Donnelly, G. N. Wheeler and C. C. Parsons are the incorporators. This incorporation means that the legal differences that have existed for some time between Four Per Cent, the O. K. group and the Olathe Placer people have been settled, and that this valuable ground is now to be thoroughly developed by the new company instead of by individuals in litigation, as in the past. A section that has long lain idle will be opened and some good results can be looked for.

LOWER HENRIETT.—Another piece of good news in mining circles is the resumption of work on this property. Recently a leasing company was formed in Leadville, and this company has taken hold of the mine, which has been idle since the strike. The Lower Henriett is a carbonate producer, and when it closed down last summer was shipping about 60 tons of low grade carbonate ore per day. Men are now at work cutting the ice out of the shaft, and it is expected by February 27th to be able to start development work, to be followed soon after by regular shipments. There are large bodies of carbonate ore exposed in the workings, although much of this ore is of a very low grade. The mine will resume work on the old scale paid before the strike, \$2.50 per day, and I understand that applications for work have been very plentiful. No attempt is being made by the lessees to fortify the place, and they announce that no discrimination will be made in hiring men. Anyone wanting work at \$2.50 per day can get it until enough men are secured. A good pumping plant has been placed in position, and no trouble from water is looked for.

MAID PUMPS.—A number of dispatches have been sent out during the past few days to the effect that the Maid pumps were to be put back. As far as I can learn this report is without foundation and arose, no doubt, from the fact that the Lower Henriett people are preparing to resume work.

PRESENT CONDITIONS.—The outlook is much brighter than it was two months ago and, as I predicted, the managers have ceased talking with the miners for a settlement and are now devoting their time to starting up. There will be a great deal of new work gotten under way here during the next few months, and I do not anticipate any trouble in securing labor. It is evident from the many applications that have come in to the Henriett people that there are plenty of men in camp now who are ready to go to work at \$2.50 per day. The iron boom mentioned in my last letter is still on, and until the smelters get their fill of this class of ore the market will be brisk. At any rate this gives the small lessees a very good opportunity to conduct development work and make their iron production pay the expenses.

SMALL HOPES COMBINATION.—The operations to be conducted by Manager S. W. Mudd, of this combination, are important to the utmost degree. In fact the work on the Marian and Emmet shafts, which are being operated under lease by these people, will open up a tract of mineralized area, hitherto unexplored and will put down the deepest shaft ever sunk in the Leadville camp. The new work will enable these people to handle the big flow of water which they can look for on account of the closing down of the Maid pumps, and it will open up an entirely new contact.

It will be remembered that at the time the Maid pumps closed it looked very gloomy for the Small Hopes people. It meant that they had either to abandon their ground, amounting to over 75 acres, or go to the expense of putting in a mammoth plant of machinery. They have decided on the latter course, and in addition to do further exploration. The lease on the Marian or R. A. M. ground has been renewed for a long time. The pumping will be done through the Emmet shaft and three more boilers to the five already in place are to be added

at once. This will give the Emmet shaft a pumping capacity of nearly 2,000 gals. per minute. The Marian shaft, already down over 1,200 ft., is to be sunk about 200 ft. further. At this depth drifting will be commenced into the third contact. This new work will be watched with interest, as but little is known of operations at this depth here and it may open up a richly mineralized area.

OURAY COUNTY.

(From Our Special Correspondent.)

BEN HUB.—Armstrong & Pennoyer have driven 275 ft. in the quartzite on the west side, and are mining some excellent ore. Shipments will commence as soon as the trail can be made passable.

BLACK SILVER.—Theodore Hess has some excellent ore in this property and is now pushing a crosscut to tap the vein at a depth of 300 ft.

CASCADE.—McCarrier Bros. are shipping two carloads per month of very rich gold ore from this mine, a mile east of Ouray.

CLEOPATRA MINING AND MILLING COMPANY.—This company, recently organized for the purpose of erecting a smelter at this point, issued its first announcement this week, asking for a share of the local patronage. The smelter will be erected on ground now owned by the company, about a mile north of Ouray and will be conducted under the management of its president, Mr. H. W. Fowler, of Chicago. The plant is designed to treat copper sulphide, silicious and lime ores. Mr. Fowler will arrive in Ouray March 1st, to begin construction and it is expected that one furnace will be in operation by June 1st.

ESPERANZA.—Warde & Company will resume operations this week. A crosscut will be run 150 ft., and a drift of 200 ft. on the vein will reach the former workings where large blocks of ore are stoped out. The Esperanza is located in the lower quartzite contact, on Corbett Creek, near the famous Bachelor.

GOLD LION.—This property, just west of Ouray, has produced a carload of very high-grade gold ore this month, which is sacked and awaiting shipment.

GRAND VIEW.—Hobson & Courtney have secured an option for the purchase of this mine and mill, just north of Ouray, on the Uncompahgre. A small force of men is at work retimbering and generally repairing the mine and plant.

JOE DANDY.—J. W. Jones, of Montrose, has engaged a force of men to work on the Joe Dandy and Mudge group, situated just east of Ouray, and has sent up supplies for the remainder of the winter; development will be carried on through two tunnels, each developing both claims.

JONACHAN.—Moore & Knapp are shipping large consignments of gold ore from the Jonachan, adjoining the American Nettle, north of Ouray.

LLOYD.—R. Porteus and others have opened up a remarkably rich pocket of free gold ore on this property, 3 miles south of Ouray. The strike was made in the tunnel, 225 ft. from the surface.

ORE SHIPMENTS.—During January ore shipments from Ouray amounted to 120 cars, a very good showing, considering suspension of shipments from the Virginis, Revenue and Khedive a greater portion of the month.

PLUTUS.—Provisions for the remainder of the winter have been sent up by pack train, and a force of men are now engaged upon development work, under the management of John Buckley.

WINDHAM SMELTER.—Several Durango and Leadville smelter men have turned their attention to this district, having secured this smelter for a trial run of 100 tons by a new matting process. If successful another furnace will be added immediately. The ore now being run is taken from the Smuggler, at the north limit of Ouray. Meyers & Lamson are the local managers.

PITKIN COUNTY.

DURANT MINING COMPANY.—A few months ago when this company put certain blocks in the mine on the market for leasing, E. K. Buttolph bid \$2,500 premium for one block. Just before Christmas Buttolph set men to work on the lease, and big shipments of ore, averaging 200 and 300 oz. in silver to the ton, commenced from the lease, and inside of two weeks the leaser had his premium earned and several thousand dollars to his credit. The men had broken into what was known as the Sayle bonanza, a big body of ore that had been lost a few years previously by a cave-in in the mine. This ore body was worked out largely in January, but since then a new vein has been found.

SAN MIGUEL COUNTY.

CLIFT GROUP.—A fine body of lead carbonates was recently struck in this group of mines at Saw Pit. The pay streak as recently discovered is fully 10 in. wide. The lead value is sufficient to make the smelting charges entirely free.

ENTERPRISE.—This mine, on Lower Mountain, has been worked through the winter, and is showing up a large body of sulphide of iron and copper, carrying silver. The mine is being worked through a tunnel, from the mouth of which an inclined chute will carry the ore to the cars. The ore is to be treated at the Silverton smelter.

IRENE.—This mine, on Cement Creek, is developed with a 160-ft. shaft and 130 ft. of drifts, and when closed down in 1893 was shipping ore which ran \$225 in carload lots.

IDAHO.

OWYHEE COUNTY.

DE LAMAR MINING COMPANY, LIMITED.—The following is the return for the month of January, 1897: Crushed during the month, 4,043 tons; bullion produced in the mill, \$47,825; estimated value of ore shipped to smelter, \$1,050; miscellaneous revenue, \$55; total produce, \$48,930; total expenses, \$42,635; profit for the month of January, \$6,295.

SHOSHONE COUNTY.

RED CLOUD MINING COMPANY.—For some time the Red Cloud mine, near Wardner, owned by this company, has been shipping about two carloads a month. A new tunnel is being run to cut the bottom of a 25-ft. shaft, in which is 6 in. of shipping and 4 ft. of concentrating ore.

(From an Occasional Correspondent.)

BIMETALLIC GROUP.—This property is now on the producing list. The mill recently installed is to be increased in capacity. This mine, formerly known as the Democrat, and owned in Chicago, was operated 15 years ago with varying success. The Chicago company, after expending \$75,000, abandoned it, and it lay idle until four years ago, when it was again taken up. This property will do much to determine the permanency of the ore deposits. Placer mining has been fairly successful this season, over \$100,000 having been cleaned up, and with the numerous bedrock flume propositions under way, it ought to be quadrupled next season.

COLUMBIA GOLD MINING COMPANY.—The Golden Group property belonging to this company is being systematically developed. A 5-stamp mill is on the ground and will commence crushing in a few days. Ex-Congressman Willis Sweet is general manager.

FRISCO GROUP.—This property, owned by Moscow parties, is producing some very fine ore.

WORLD'S FAIR.—This property is showing up as an ore producer. Messrs. Gaffery & Erickson are driving a tunnel to tap the vein at a depth of 200 ft. The ore as exposed on the 100 ft. level runs \$25 per ton in gold.

MICHIGAN.

COPPER.

CENTENNIAL MINING COMPANY.—This mine is now reported entirely free of water, and arrangements are being made to put a considerable force of miners at work.

COPPER PROPERTY SALE.—Despatches from Houghton, Mich., report that representatives of the Bigelow syndicate, of Boston, have secured an option on 80 acres of land lying immediately east of the Centennial and south of the Wolverine property.

ISLE ROYALE CONSOLIDATED MINING COMPANY.—This company has filed articles of association at Houghton, Mich. The capital stock will be 100,000 shares of par value \$25 each. The company will work several old mines, including the Isle Royale, Portage and Huron. The incorporators are: W. A. Parnall, Calumet, Mich.; Charles H. Altmiller, P. Dumarcey, Boston; Clarence H. Bissell, Winthrop, Mass. It is reported that Mr. Richard M. Edwards, at present connected with the Tamarrack, will have charge of the property of the new company.

MINNESOTA.

(From Our Special Correspondent.)

The Duluth, Missabe & Northern Railway is building a double-track line from the top of the hill above Duluth to Columbia Junction, 26 miles out, to enable it to move greater quantities of ore. It is also cutting down the only grade against traffic that was of moment. The line from Columbia junction to the mines is so filled with sidetracks as to make almost a double track.

IRON—MESABI RANGE.

(From our Special Correspondent.)

ETNA MINING COMPANY.—This property, which has a large deposit of good ore, is to be opened this year for extensive mining by its new owner, the Thomas Iron Company.

ARCTURUS IRON COMPANY.—Continued good reports come from this property, which is the westernmost prospect on the Mesabi Range, and only about 12 miles from the Mississippi River. There are said to be about 3,000,000 tons of ore shown up, and the quality of most of it is claimed to be fine. Work has been carried on all winter under the direction of Capt. John Mallman, one of the pioneers of the development of the Mesabi Range. There is at present no railroad running to the property, but it is but a few miles from the line of the Duluth, Superior & Western, a part of the Canadian Pacific system, and assurances have been given that the road will build in as soon as needed. The mine will be an important factor of the range soon.

ROBERTS MINING COMPANY.—This company has been incorporated with \$50,000 capital, by Capt. Harry Roberts, of Duluth; John H. Barstow, of Cleveland, and Wm. White, of Biwabik, to operate the Pettit and Robinson lands at McKinley recently secured. Tracks will be built in to the mine soon, and considerable shipments are looked for this year.

SAUNTRY LANDS.—These lands, at Virginia, are to be opened for mining this year if the market is favorable. The Sauntry contains vast stores of ore and is a stripping proposition, though parts of its

ore body are not of very high grade. It will be an immense mine, however.

SELLERS ORE COMPANY.—This mine, owned by the Sheenberger Steel Company, is employing about 75 men and is hoisting 325 tons of excellent ore daily. It will have a very fair stock pile at the opening of navigation and will be a large shipper during 1897.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The weather was admirable throughout the entire week, and much ore purchased during the preceding week was loaded. The shipment of zinc ore was 24 carloads more than the preceding week, and 16 more than the corresponding period of last year. The lead shipment was three cars less than the preceding week, and 16 carloads less than in 1896. The highest price paid was \$22 per ton, 150 tons of Joplin ore selling at that price. The highest price elsewhere was \$21 per ton, and ranged down to \$17. The top price for the corresponding week last year was \$23.50 per ton. Lead ore was strong at \$17.50 per thousand pounds delivered up to Friday, and closed the week firm at \$17.75 delivered. The corresponding week of 1896 lead began at \$17.75, and closed at \$18. The following are the sales of zinc and lead ores for the week ending February 20th, 1897: Joplin zinc, 1,358,840 lbs.; lead, 182,280 lbs.; value, \$17,547. Carterville zinc, 675,670 lbs.; lead, 182,990 lbs.; value, \$9,622. Webb City zinc, 738,060 lbs.; lead, 82,000 lbs.; value, \$8,446. Galena, Kan., zinc, 3,210,000 lbs.; lead, 347,490 lbs.; value, \$34,971. Aurora zinc, 405,000 lbs.; lead, 30,000 lbs.; value, \$2,933. Oronogo zinc, 120,080 lbs.; lead, 13,030 lbs.; value, \$1,477. Alba zinc, 84,000 lbs.; value, \$882. Granby zinc, 581,000 lbs.; value, \$4,938. Carthage zinc, 40,000 lbs.; value, \$400. Zincite zinc, 13,230 lbs.; value, \$119. District totals for the week: Zinc, 7,170,900 lbs.; lead, 840,190 lbs.; value, \$81,234. District totals for seven weeks: Zinc, 41,587,180 lbs.; lead, 6,752,580 lbs.; value, \$490,246.

CENTER VALLEY MINING COMPANY.—Superintendent Hannum, of this company, operating a lease in Center Creek Valley, across from Oronogo, is testing a Miracium pump in draining the ground. The company has good lead from 10 ft. to 30 ft. and zinc ore from 90 ft. to 100 ft., which they have been unable to work on account of the strong water.

LINZEE MINING COMPANY.—A carload of zinc ore from this company's mine was shipped to Carondelet to be smelted. It contained 20 tons of zinc ore, which brought \$20 per ton. This is the first car of ore shipped from Carthage since the Ihseng mines, at Pleasant Valley, shut down two years ago.

SOUTH CARTHAGE MINING COMPANY.—The land south of Carthage, over which so much excitement has been wrought in that city, is owned by W. P. Smith, a farmer. The South Carthage Company has a 10-year lease of 80 acres and has plotted 40 acres into 48 mining lots. About 20 shafts are started, in one of which the Peeble Cycle Company has struck silicate of zinc at 3½ ft. below the surface. The lot on which this silicate strike was made corners with the four lots reserved by the South Carthage Company on one of which is a discovery shaft showing up a fine face of zinc ore at 37 ft.

ZINCITE MINES.—The preliminary work of re-opening the old Belleville mines is being done. Belleville has had two booms and two setbacks. The latter boom, about seven years ago, was one of considerable magnitude. Belleville then changed the name of its postoffice to Zincite. There is no doubt in the minds of miners who knew where ore was left when the mines were drowned by the withdrawal of the pumps that Zincite will again become a good camp if the ground is drained. The work of putting in pumps, now being pushed by Superintendent Stuckey, on the Wright land, is the beginning of concerted action to be brought about to restart pumps on all the old and several new tracts. P. L. Garrity, of Chicago, the present owner of the Holden tract, has the five pumps drawn from the ground, housed and in a condition that they can be replaced on short notice. The company on the Murphy land expects to be ready to begin placing pumps by March 1st. Reed & Blair have a lease on 40 acres of the Collins land, north of the Murphy, and they will join in starting with the others. H. Jones & Company have 40 acres of the W. E. Johnson land leased and miners are seeking a pump shaft. De Graf Bros. are drilling another track about a mile north of Zincite and Lee Holden is prospecting a tract still north of them. With a continuation of fair prices for ore, spring will open up an old-time activity in and around Zincite.

MONTANA.

JEFFERSON COUNTY.

AJAX MINING COMPANY.—This company, of Helena, has come into possession of the Stray Horse mine, taking up the bond given last year for \$75,000. The money was paid last week. The Stray Horse was located three years ago. It is 6 miles from Winston, on the road between Butte and Helena.

SILVER BOW COUNTY.

(From Our Special Correspondent.)

ALTOONA.—Crosscutting is in progress on the 300-ft. level to find the vein which was encountered on the 200-ft. level which assayed from 18% to 20% copper.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—At the West Colusa, preparation is being made for placing a head frame and sheave wheel at the 600-ft. level, preparatory to sinking to the 900 ft. The size of the shaft will be 9 ft. x 17 ft. 8 in. in the clear, wall plates, 12 in. x 12 in. timber, end and counterpieces, 12 in. x 14 in. This will allow two cars to be placed end to end on each deck of the cage.

COLORADO SMELTING AND MINING COMPANY.—The Gagnon mine is producing more ore than ever. On the 1,500-ft. level the ore is about 50 ft. wide, and from 400 to 500 tons are hoisted daily. About eighty men are employed on each shift underground. At the Old Glory development work is in progress, but no ore is hoisted.

EVELINE.—P. Mullins is pumping the water out of this silver-gold mine, on which he has secured a lease. It has produced large quantities of high-grade ore, and made several lessees rich. The shaft is down 300 ft., with 100 ft. of water in it.

HOMESTAKE.—This mine, which was shut down for a short time after the Glass Brothers relinquished their bond on it, is in operation again. It is reported that a body of ore was discovered on the 400-ft. level, which will assay over 6% copper throughout its 15 ft. width.

LITTLE ST. LAWRENCE.—Lessees are busy taking the water out of this mine. The vein is small, but carries high-grade silver-gold ore. The shaft is 120 ft. deep.

NORTH WESTERN.—A vein was cut in the south crosscut about a week ago which is about 4 ft. wide, with no pay ore where it was cut.

WASHOE COPPER COMPANY.—At the Moonlight, crosscutting on the 600-ft. is in progress. The shaft is going down steadily, being at present about 750 ft. deep. At the Poulin the shaft is completed to the 1,200-ft. level, where a station is being cut. There are also a few men working on the 800 ft. level.

NEVADA.

STOREY COUNTY—COMSTOCK LODE.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—The official report of the work done during the week ending February 12th is as follows: 1,000 level—The south drift has been extended 22 ft., passing through porphyry, clay and quartz of low assay value; total length 102 ft. 1,550 level—The south drift from the west drift, which runs parallel with and close to the footwall where the good streak of ore was found, has been extended 13 ft., passing through porphyry streaked with quartz in the lower half of the drift, assaying from \$5 to \$15 per ton; total length 49 ft. In cutting out on this drift for posts we have saved 4 tons of ore assaying \$115.20 per ton. 1,650 level—On the 9th floor the inclined upraise has been carried up 18 ft. on the slope passing through porphyry, clay and quartz assaying from \$1 to \$2.50 per ton; total height, 88 ft. on the slope above the 1,650 level. From the incline upraise, at a point 60 ft. above the sill floor of this level, we have worked west on a streak of ore and have extracted therefrom six tons assaying \$70.30 per ton. From the top of the incline raise, 88 ft. up on the slope, a west crosscut has been started and advanced 19 ft., passing through porphyry, clay seams and lines of quartz, assaying \$1.75 per ton. 1,750 level—From the 10th, 11th, 12th and 13th floors, on the east side above the sill floor of this level, at the north end of the slope in old ground of former workings, we have extracted 31 tons of ore; the average assay value, per samples taken from the cars in the mine, was \$26.50 per ton. The total extraction of ore for the week amounted to 37 tons; the average assay, from samples taken from cars when raised to the surface, was \$41.02 per ton.

WHITE PINE COUNTY.

CHAINMAN GROUP.—This group of mines, in Robinson District, near Ely, has been sold by W. N. McGill, W. G. Lyons, James P. McComie and A. J. Underhill to Charles Love and a company for \$125,000, and the company will carry on extensive operations the coming season. The group, consisting of the Chainman, Chairman Gore, The V. Turkey and Southern Cross, has been extensively worked since 1891, and has produced about \$850,000 in a mill located in the town of Ely, two and a half miles distant, the mill being of 10 stamps and having a capacity of 20 tons of ore per day.

NEW JERSEY.

NEW JERSEY ZINC COMPANY.—The consolidation of five zinc and iron companies under the above name, with a capital stock of \$10,000,000, has just been effected. The two principal companies are the Lehigh Zinc and Iron Company, of South Bethlehem, Pa., and the New Jersey Zinc and Iron Company, of Newark, N. J. The other companies are the Florence Zinc Company, the plant of which is near Freemansburg, Pa.; the Passaic Zinc Company, of New Jersey, and the Mineral Point Zinc Company, of Mineral Point, Wis. The consolidation is the result of the compromise of a litigation between the two main companies in the new deal, which has been before the courts since 1857. This legal controversy has been over the ownership of the mines at Mine Hill, N. J., from which the zinc ore was mined by both companies. When the consolidation of the companies was proposed the Lehigh Zinc and Iron Company, which owned the Florence Zinc Company,

insisted that the latter concern be taken into the deal. This was agreed to and then the Passaic Zinc Company, which owned half the mine at Sterling Hill, N. J., the other portion being the property of the New Jersey Zinc and Iron Company, was also brought into the new concern, as was the Mineral Point Company, in which there was also an interest. The new concern has just issued bonds to the amount of \$1,700,000. S. S. Palmer, formerly president of the New Jersey Zinc and Iron Company, is president of the new corporation; August Hecksher, former treasurer of the Lehigh Zinc and Iron Company of South Bethlehem, is its general manager, and J. Price Wetherill, who had long been general manager of the South Bethlehem Company, has been elected consulting engineer. The plants of all the companies will be operated by the new concern.

MORRIS COUNTY.

ORANGE MINING AND MILLING COMPANY.—This company is just organized for the purpose of mining gold at Budd's Lake. The leading spirit is Herman J. Goebert, of Newark. The capital stock of the company will be \$15,000.

NEW MEXICO.

SANTA FE COUNTY.

ALBEMARLE GROUP.—Howell Hines, of Cleveland, O., recently obtained a lease and bond on this group of mines, in the Cochiti district. The group consists of 4 mines and the lease runs for 6 months. During that time \$25,000 are to be expended in the development of the mines. The price named in the bond is said to be \$100,000. The Albemarle lead is one of the widest in New Mexico, averaging 30 ft. Sufficient water for milling purposes is not obtainable in the camp, but an attempt will be made to get water in Colla Canyon.

NEW MEXICO MINING COMPANY.—In the Civil Court, Judge Laughlin has issued an order in the case of Newton Finney, of New York, vs. this company, enjoining all officers and agents from interfering with or disposing of any of the property of the company, which consists of the Ortiz mine grant and continuing in force the appointment of S. B. Elkins as Receiver of the corporation. All squatters on the grant, which number 46 miners holding claims there under United States laws and various contracts with the company, have been served with notice to appear and show cause why they should not vacate their holdings. This proceeding is taken in order to enable the Receiver to adjust all outstanding claims against the property, one of which amounts to \$15,000 for past due taxes, and get rid of the miners and small stockholders, preparatory to a reorganization of the corporation. Senator S. B. Elkins, R. C. Kerens, L. N. Lawson and D. O. Mills, of New York are the principal owners of the property, and it is announced that \$250,000 will be invested in opening the gold mines and erecting mills as soon as reorganization can be effected.

SIERRA COUNTY.

CLIFF MINING AND SMELTING COMPANY.—The 125-ton smelter of this company at Chloride has been blown in and there is now a home market for the ores mined in that vicinity.

PENNSYLVANIA.

PURE OIL COMPANY.—The consolidation of the United States Pipe Line Company, the Producers' and Refiners' Pipe Line Company, the Producers' Oil Company, Limited, and the Pure Oil Company, five independent oil producers of Pennsylvania, under the name of the Pure Oil Company, to fight the Standard Oil Company, has been announced. At the first annual meeting, just held at Jersey City, the company, which was organized under the anti-trust laws of Pennsylvania, reorganized under the trust laws of New Jersey and the capital stock was increased to \$3,000,000. The following directors were elected: Michael Murphy, Philadelphia; C. P. Collins, Bradford, Pa.; E. H. Jennings, Pittsburg, Pa.; J. W. Lee, Pittsburg, Pa.; V. K. Phillips, Butler, Pa.; Peter Thasbold, Oil City, Pa.; T. R. Westcott, Titusville, Pa.; Lewis Emery, Bradford, Pa. and Hugh King, New York. At a meeting of the directors the following officers were chosen: President, J. W. Lee; vice-president, Michael Murphy, and treasurer, Hugh King.

ANTHRACITE COAL.

DELAWARE & HUDSON CANAL COMPANY.—This company's Black Diamond breaker, in Wilkes-Barre, was totally destroyed by fire on February 20th, entailing a loss of about \$80,000. The fire is supposed to have been started by a spark falling from an oilers' lamp as he passed through the engine-room. The breaker was built in 1854-55, had a capacity of 800 tons a day and employed (in mines and breaker) 600 men and boys.

LEHIGH & WILKES-BARRE COAL COMPANY.—At the annual meeting of this company the following officers were elected: President, J. R. Maxwell; directors, G. F. Baker, J. A. Garland, J. S. Harris, Samuel Dickinson, C. Pardee, A. H. McClintock. No annual report was presented.

MINE INSPECTORS' REPORTS.—The report of Edward Roderick, inspector of the First Anthracite District for 1896 shows that 6,227,447 tons of coal were mined, which is 283,370 tons less than during 1895. There were 51 fatal and 134 non-fatal accidents, so that for each accident, fatal and non-fatal, 33,694 tons of coal were mined. An average

of 170 1/4 days were worked by each mine, as against 182 3/4 days in 1895. The number of employees was 17,604, and the number of tons produced per employee was 353.76. Of the 51 fatal accidents 35 were caused by falls of rock and coal, 6 by cars and 5 by blasts. Of the non-fatal accidents 61 were caused by falls of rock and coal, 33 by cars and 11 by blasts.

Henry O. Prytherch, inspector of the Second Anthracite District, reports that during 1896 there were 5,895,669 tons of coal mined in his district by 16,353 men. The fatal accidents numbered 39, which shows that 151,171 tons were mined for each life lost. The total number of accidents was 200, giving an average of 29,478 tons of coal mined for each accident.

Mine Inspector H. McDonald, of the Third (Pittston) Anthracite District, has 46 collieries to visit, which in 1896 produced 5,673,008 tons, a decrease of 541,836 tons from 1895. The total number of fatal accidents was 109, an increase of 40. It will be remembered that 58 of these occurred in the Twin Shaft disaster last June. The number of non-fatal accidents was 209, an increase of 42 over 1895. The average number of days worked was 150.60, against 182.70 in 1895. Number of employees was 17,357, only 56 less than the year before, and the number of tons of coal mined per life lost was 52,045, as compared with 90,070 in 1895.

G. M. Williams, inspector of the Fourth Anthracite District, reports a total of 8,017,852 tons mined in 1896 as against 9,066,539 in 1895. The total number of employees was 26,059, which is 1,487 more than during the previous year. The average number of days worked was 150, 12 less than in 1895. There were 73 fatal accidents, 225 severe and 81 slight accidents from the following causes: Fire-damp, 14 fatal and 66 non-fatal but severe; falls of roof and coal, 25 and 59; by mine cars inside, 12 and 46; explosions of powder and blasts, 5 and 14.

UTAH.

JUAB COUNTY.

TRIUMPH CONSOLIDATED MINING COMPANY.—This company was incorporated recently with a capital stock of \$200,000 in \$1 shares. The incorporators are: John A. Kirby, Ives E. Cobb, both of Eureka; Josiah Barnett, Theodore Bruback, C. E. Allen, N. A. Robertson, trustee, and S. T. Pearson, all of Salt Lake. The officers and directors are: John A. Kirby, president and manager; Theodore Bruback, vice-president; Ives E. Cobb, secretary; Josiah Barnett, treasurer; S. T. Pearson, assistant secretary and auditor. The company acquires by purchase of the stockholders the Helen, Pride of Hills Fraction and Indian Girl mining claims in the Tintic District; also a lease for two years and option to purchase for \$10,000, the Mormon Chief, Pride of the Hills, Silver Star, Sunday and Extension Sunday mining claims, in the same district.

UINTA COUNTY.

GILSONITE MINING COMPANY.—Bert Seaboldt, manager of this company's property, near Fort Duchesne, says that the mines, which were recently overcome by fire, are being rapidly restored to their former condition, and that the production of asphalt will begin again in a short time.

WASHINGTON.

STEVENS COUNTY.

HUCKLEBERRY.—In Chewelah District, this mine, on a mountain of the same name, has been bonded to an English syndicate for \$50,000 by the Spokane owners. The ledge has been crosscut for 75 ft., exposing a large body of free milling ore.

WEST VIRGINIA.

MARION COUNTY.

COAL LANDS PURCHASED.—James W. Hall has bought, in Pawpaw and Fairmont districts, in the last year 166 farms, aggregating between 16,000 and 18,000 acres of the best coal lands in the State. Mr. Hall represents J. M. Guffy & Company, of Pittsburgh.

WYOMING.

SWEETWATER COUNTY.

GREEN RIVER SODA WORKS.—This company, of Cheyenne, Wyo., has been incorporated with a capital stock of \$1,000,000. The company will prospect for oil, gas and soda, deal in soda and all products of soda, etc. The incorporators are J. V. and F. J. Waters, E. J. Morris, T. S. Talliferro and A. T. Coyle.

FOREIGN MINING NEWS.

AFRICA.

GOLD COAST.

WASSAU GOLD MINING COMPANY.—This company reports for January 496 tons of ore worked, producing 701 oz. of gold; an average result of 1.41 oz. per ton.

BRITISH COLUMBIA.

PRODUCTION IN 1896.—The recent report of the Department of Mines gives the production of the Ainsworth, Nelson and Slocan Districts in 1896 as below:

Table with 4 columns: Gold, oz.; Silver, oz.; Copper, lbs.; Lead, lbs.; Total value. Rows for Ainsworth, Nelson, Slocan.

In the Ainsworth District nine mines shipped 1,664 tons of ore, chiefly concentrates; in the Nelson four mines shipped 30,160 tons; in the Slocan 42 mines shipped 18,215 tons.

SLOCAN DISTRICT.

ELKHORN MINING COMPANY.—The directors of this company held a meeting recently and elected the following officers: President, Chester Glass; vice-president, C. F. Caldwell; secretary, David Glass. In addition to the above the trustees are W. R. Winstead and Otto Semich. The Elkhorn is the eastern extension of the Whitewater and adjoins that property. The company will push development.

TRAIL CREEK DISTRICT.

(From Our Special Correspondent.)

COLUMBIA & ONTARIO GOLD MINING COMPANY.—The Pug property is situated near Waneta at the junction of the Columbia and Pend Oreille rivers. The surface showing consists of the iron hat varying from 400 ft. to 500 ft. in width, which on examination has shown up three distinct leads, all composed of solid ore. A tunnel is being driven to crosscut these leads, which are now in a 112 ft., and it will strike the first lead in about 30 ft. from the present face and 175 ft. below the surface. The assay shows \$8 in gold. The tunnel runs between calcite heavily streaked with pyrrhotite, easily worked. The tunnel is 100 ft. from the Nelson & Fort Sheppard Railway and about 1,000 ft. from the Columbia River, giving easy communication with the smelters at Nelson and Trail, and the proposed one at Northport. There is a good supply of water and timber. The company has erected the necessary buildings, and a compressor and steam drill plant will be installed in a few weeks. The management of this mine is in the direct hands Mr. T. B. Miller, formerly of Sault, St. Marie. Mr. Jonathan White, of the same place, is president, Mr. R. R. Ganney, of Waneta, B. C., is secretary, and Mr. Frank Moberly, of Rossland, B. C., is consulting engineer.

ENGLISH CANADIAN GOLD MINING COMPANY.—The Juliet is near the mouth of the Beaver River and is the property of this company. A tunnel has been driven about 60 ft., and it is still about 30 ft. from the lead. The face of the tunnel is yielding \$28 in gold.

INTERESTS OF INVESTORS.—It is also proposed, with regard to a foreign company, that, although its acts may be valid by the laws under which it is incorporated, they are not permissible unless they accord with the regulations of this act. It also provides that every foreign company shall have a registered office in British Columbia and shall register the name of its agent or manager. All companies will be compelled to prepare a balance sheet once a year, showing receipts and expenditures for the year previous, and these balance sheets are to be very complete in detail. The rate for registering companies will be 6 1/2% on capitalization. Prospectuses will have to be prepared with more regard to the facts than heretofore. There is a heavy penalty for false representation.

PROPOSED AMENDMENTS.—The Provincial Government has introduced a bill amending the Companies Act. One of its chief provisions is that "no company formed under this act shall commence business unless 10% of its capital stock shall be paid up in cash, exclusive of any amount payable otherwise than in cash, and there has been filed with the registrar a statutory declaration by the secretary or one of the directors that the above condition has been complied with." It is not yet certain whether this provision will be carried or not. There is some opposition to it, though at the same time public opinion in the province is ready for more stringent mining laws, especially against over-capitalization and the abuses which have crept in under the present regulations.

ORE SHIPMENTS.—The following are the shipments of ore in tons by the various mines around Rossland, from January 1st to February 15th, 1897: Le Roi, 4,374; War Eagle, 1,810; Iron Mask, 322; Columbia and Kootenay, 295; Josie, 126; Jumbo, 91; Cliff, 40; Red Mountain, 36; O. K., 41. Total, 7,135 tons.

PETROLEA GOLD MINING AND DEVELOPMENT COMPANY.—This company is developing a claim which is situated about a mile above Waneta on the Columbia River. The superintendent is Mr. Ralph Gillespie, late of Petrolea and Sudbury. The development work consists of a shaft-house; a shaft sunk 25 ft., the whole being on ore, composed of quartz and calc spar, well mineralized with a streak of decomposed quartz running down and through it and assaying \$15 per ton in gold. This streak is now 5 in. wide, and it has been gradually opening out. There are three leads on this property, and it shows well on surface in copper and iron. The country rock is porphyry and diorite, the latter containing a good deal of mineral. This property is well situated for shipping, the shaft being within 30 ft. of the Nelson & Fort Sheppard Railway, and near the junction of the Beaver and Columbia Rivers. The officers of the company are: Mr. O. W. Chamberlain and Mr. Corry, of Petrolea, Ont., and Mr. Frank Moberly, who is consulting engineer.

RAMBLER & CARIBOO CONSOLIDATED MINING COMPANY.—This company has declared its first dividend of \$20,000, payable March 15th. The directors promise a monthly dividend of the same amount for the next five months. The property is in the

Dardanelles basin and comprises the Rambler, Cariboo, Antelope, Tiger and Best Fraction. The capital is \$1,000,000. The officers are J. B. McArthur, Rossland, president; A. L. McLaive, Kaslo, secretary; Richard Shea, treasurer. The headquarters of the company are at Spokane, Wash.

CUBA.

PONUPO MINING AND TRANSPORTATION COMPANY.—At the annual meeting of this company, held February 18th in Bethlehem, Pa., the following board of directors were re-elected: J. F. Anderson, George D. McCreary, J. S. Wentz, John Fritz, George H. Myers, Truman M. Dodson, Samuel Thoaaas, J. W. Fuller and Samuel Adams. The board subsequently organized by re-electing J. F. Anderson, president; George D. McCreary, vice-president, and Wm. B. Myers, secretary and treasurer. The company's famous manganese ore mines are in the very heart of the Cuban rebellion and have not been operated since the commencement of the insurrection. The mines are being looked after at present by Charles Ziegenfuss, of Bethlehem, who is in Cuba.

MEXICO.

CHIHUAHUA.

SANTA DOMINGO.—There is much activity in the Santa Eulalia District, only 7 miles from Chihuahua. The output averages over \$300,000 worth of ore per month. One of the richest mines in the district is the Santa Domingo. It has 300,000 tons of ore in sight, which assays high in silver and lead. Owing to the splendid fluxing qualities of this ore it is profitable to ship the product to smelters in Denver and Kansas City, although the company has three 80 ton furnaces at the mine.

ONTARIO.

RAT PORTAGE DISTRICT.

DOMINION GOLD MINING AND REDUCTION COMPANY.—Count Oscar Von Reichenbach and Mr. George Arthur Jones, of London, England, have been elected directors, and Mr. Alexander Marshall Hay, of Rat Portage, has been elected chairman.

QUEBEC.

ASBESTOS & ASBESTIC COMPANY, LIMITED.—This company has been formed in London with a capital of £500,000 in shares of £10 each, of which 16,666 shares will be allotted as fully paid to the vendors, and 33,334 are now to be issued, of which 3,334 will be allotted to the H. W. Johns Manufacturing Company, of New York. The company will take over and further develop a deposit of asbestos at Danville, Canada, about midway between Montreal and Quebec, four miles from the Grand Trunk main line, with which it is intended to connect at once by means of a short branch. The purchase price is £450,000, payable £166,660 in shares and £283,340 in cash. These mines have been partly developed and have a large plant for the preparation of asbestos for market and the manufacture of asbestic, or asbestos plaster for building purposes.

QUEENSLAND.

MOUNT MORGAN GOLD MINING COMPANY.—In the month of January there were 8,307 tons of ore worked, from which 13,070 oz. gold were recovered, the average result shown being 1.5 oz. per ton.

SOUTH AFRICA.

RHODESIA.

GOLD OUTPUT OF RHODESIA.—According to the Rhodesian Times, published at Salisbury, in the British South Africa Company's territory, the following figures represent the entire gold output from Rhodesia, including all gold won from crushings and test operations, since the year 1890. In some cases, it is stated, records have not been obtainable as to the tonnage of ore milled, but the list can be generally considered as complete:

Table with 3 columns: Location, Tons crushed, Gold, oz. Rows: Mazoe, Umfuli, Salisbury, Lo Magondi, Victoria, Manica, Matabeleland, Totals.

The largest number of companies reported are in the Umfuli district, but the most extensive operations have been carried on in the Victoria district.

TRANSVAAL.

COAL PRODUCTION.—The total coal production of the Transvaal mines in 1896 is reported at 1,350,566 tons, all of which was consumed in the country. There were 20 collieries reported, a number of them being small. Five collieries produced considerable quantities, as follows: Brakpan, 322,480 tons; Cas sel, 306,325; Great Eastern, 206,435; Vereeniging, 168,804; Springs, 125,913 tons.

WITWATERSRAND GOLD PRODUCTION.—The gold output reported by the mines for the month of January was 209,832 crude oz. This is 3,314 oz. more than in December, and is the highest monthly report yet made, with one exception, 213,418 oz. in August, 1896. It compares with 148,178 oz. in January, 1896, and with 177,468 oz. for 1895. At the usual rate for Witwatersrand gold, the production this year was equal to 171,223 fine oz., or \$3,539,180.

WESTERN AUSTRALIA.

GOLD PRODUCTION.—The new West Australian Chamber of Mines in London makes the following report for the month of January from 25 reporting companies: Ore crushed, 11,265 tons; gold recovered,

27,935 oz.; average yield, 2.48 oz. per ton. The returns do not include the operations of several of the local companies.

LATE NEWS.

BY TELEGRAPH.

(From Our Special Correspondent.)

LEADVILLE, COLO., February 26th.—In the Moffat shaft, lying south of the Emmet, on Rock Hill, and now operated by the Rock Hill Gold and Silver Mining Company, a big strike has just been made. The breast of the drift is heavily crystallized with chlorides showing average assays of over 400 oz. silver to the ton. This opens up a new territory and proves conclusively the continuity of the Iron Hill ore chutes to the southwest. This shaft is on the Nil Desperandum property. This strike is considered one of the most important made for years in any Leadville mine.

AMERICAN INSTITUTE OF MINING ENGINEERS.—The following is the list of the officers elected at the annual meeting in Chicago: President, Dr. Thomas M. Drown, South Bethlehem, Pa. Vice-presidents, D. W. Brunton, Aspen, Colo.; W. E. C. Eustis, Boston; James Douglas, New York. Managers, C. W. Goodale, Butte, Mont.; Frank Lyman, Brooklyn, N. Y.; Frank McM. Stanton, Houghton, Mich. Treasurer, Theodore D. Rand, Philadelphia. Secretary, Dr. Rossiter W. Raymond, New York.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Feb. 26.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending February 20th, 1897, compared with the corresponding period last year:

	1897.		1896.
	Week.	Year.	Year.
Pennsylvania Railroad.....	86,281	673,067	512,638

PRODUCTION OF BITUMINOUS COAL in tons of 2,000 lbs. for week ending February 20th, and for years from January 1st, 1897 and 1893:

	1897.		1896.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	38,821	294,696	318,534
Barclay, Pa.....	1,138	6,179	6,800
Beech Creek, Pa.....	72,912	510,356	490,774
Broad Top, Pa.....	6,917	54,532	61,118
Clearfield, Pa.....	75,480	738,176	630,313
Cumberland, Md.....	70,692	418,639	371,806
Kanawha, W. Va.....	192,553	452,900	473,129
Phila. & Erie.....	816	15,118	7,324
Pocahontas Flat Top.....	.....	.....	361,739
Totals.....	359,329	2,470,595	2,774,537

! For week ending February 7th.

	1897.		1896.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	20,082	190,334	120,802
Pittsburg, Pa.....	34,146	283,947	214,617
Westmoreland, Pa.....	32,492	233,475	238,011
Totals.....	86,720	727,756	655,493

Grand totals..... 446,049 3,198,352 3,428,030
 Production of coke on line of Pennsylvania Railroad for the week ending February 20th, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 89,789 tons; year, 624,450; to corresponding date in 1896, 737,143 tons.

Anthracite.

The hard coal trade is generally reported dull, though what coal is being mined can be disposed of without difficulty and without a sacrifice in prices. Reports from the mines go to show that restriction is being enforced by the collieries working half-time and even less. It has been given out that during January 2,840,000 tons of coal were mined, a quantity exceeding the predetermined output by 340,000 tons. It is calculated on this basis that the output for the first two months of the year will be 5,000,000 tons more than the 5,000,000 tons that were to be mined. This is not credited in some quarters, as it is said that some companies had arranged to mine a larger quantity in January than was subsequently determined upon, and that these companies have curtailed their production correspondingly in February. Present conditions are to be maintained during March; mining is to be on a basis of 2,500,000 tons, and the July circular of prices is to be strictly adhered to. This confirms the statement made last week that spring prices are not in favor of this year, and are not likely to be decided upon except under extreme conditions. The f. o. b. rates now asked are \$3.75 for broken, \$4 for egg and chestnut and \$4.25 for stove. The Legislative Investigating Committee has this week probed the methods of the so-called "coal barons" and has succeeded in eliciting the same information that the readers of the *Engineering and Mining Journal* were given through its columns from time to time during the past year. The committee learned nothing new, and absolutely nothing of the incriminating nature they had expected, or at least attempted, to reveal. The only thing they did was to bring out more positively, by admissions from indisputable sources, that the anthracite coal trade has been in a most deplorable condition.

NOTES OF THE WEEK.

The recent election of the Delaware, Lackawanna & Western Railroad resulted as follows: President, Samuel Sloan; secretary, Fred. F. Chambers; treasurer, Frederick H. Gibbens; managers, John I. Blair, Eugene Higgins, William W. Astor, William Rockefeller, Henry A. C. Taylor, J. Rogers Maxwell, George F. Baker, J. Stillman, Frank Work, Hamilton McK. Twombly, Harris C. Fahnestock, Frederick W. Vanderbilt, M. Taylor Pyne, Rosewell G. Rolston. Mr. Rolston succeeds Mr. A. T. Van Nest, deceased.

Bituminous.

The present demand in the Eastern seaport trade is slightly improved, though more than that cannot be said, and there is some contention that the slow transportation of coal in the last week or 10 days has much to do with the appearance of the slightly improved condition. The far East continues to make but little demand for coal for present delivery; Sound ports are somewhat better than last week in their demands for present shipments, and New York Harbor trade is also improved. All-rail trade shows the effect of a few first orders on contracts, it is thought, the tonnage being slightly increased.

There are still some season contracts being made, though some of the prices named by rumor on the poorer grades of coal are lower than ever before and, we should judge, are ruinously low. There will probably continue to be a closing up of the remaining open contracts for the next month and possibly longer. There has been some gossip regarding possible strikes the coming season in two or three of the regions, though the operators generally are setting their faces against any reduction in the laborers' wages, and the endeavor seems to be to keep as such as possible away from this idea.

Transportation has been very poor during the week, especially to the harbor shipping ports. In the fore part of the week the railroad companies were just recovering from the effects of ice and snow and had not quite reached their normal condition when the high water in many localities affected them to a more or less extent, delaying coal from two to three days in running through and producing a scarcity during the last of the week at the New York harbor shipping ports. Car supply continues good on all railroads, and there are no embargoes of shipments to points on foreign roads.

In the coastwise vessel market vessels are still scarce, none having come out of winter quarters as yet. It is thought that the coming season will see lower rates for vessels than last year, and last year's rates, except in particular cases, did not return a new dollar for an old one.

We quote current rates of freight from Philadelphia to Boston, Salem and Portland, 85c.; Portsmouth, 90c.; Providence, New Bedford and other Sound ports, 70c. Five cents above these rates is charged from the lower shipping ports.

Buffalo.

Feb. 25.

(From Our Special Correspondent.)

The anthracite coal trade is fairly active at unchanged quotations for city and out of town consumption. The bituminous business is also fairly active; manufacturers are joggling along filling small orders and preparing for the expected increase in orders which has been long delayed. Prices are without variation, and dealers continue to hold firm views and adhere to schedule rates in almost every instance. News items are scarce as usual at this season of the year.

The weather in this section, after several warm days, changed on Monday and Tuesday to cold; since snow flurries and sharp piercing winds have prevailed.

Senator Lamy has asked the Legislature to appropriate \$5,000,000 this season, being a second installment of the \$9,000,000 granted for the enlargement and improvement of the State canals.

A bill has again been introduced in the Legislature defining the weight of a ton of coal to be 2,000 lbs. and providing for a penalty not exceeding \$50 for deficiency in the weight. The bill is said to be favorably considered by a majority of the members.

Generally trade in Buffalo is better than before this year, prospects are brighter and dealers sanguine that a steady improvement has set in.

Chicago.

Feb. 20.

Anthracite.—The condition of the anthracite coal market is unchanged, business is bad and prices weak. Buying has been merely in quantities for present use, and there appears but small tendency to any different policy. Out-of-town trade has slackened, and but little inquiry is coming in from that direction. Business is down to a weather basis and cold snaps are about over for this winter. There are large quantities of coal on the docks and yards of the city, and which is being added to each day, though shipments have fallen off somewhat since the recent cold weather. Prices of hard coal in consequence of poor business and great competition have fallen, and it can be bought at retail for \$5.75. It looks as though a lower price may occur. Circular prices are per ton f. o. b.: Chicago Grate, \$5.35; egg, stove and chestnut, \$5.60.

Bituminous Coal.—Owing to the increased demand for iron and steel coal has been in better demand during the past week, but as yet business is away below par and prices are very weak, indeed,

so much so that shippers are complaining and in consequence the miners are being compelled to mine at lower wages. Competition for the limited business going is great and the consumer gets his coal at very low figures. It is a wonder that not more take advantage of the present situation. The outlook for industrial enterprise has not looked better for a number of years and the present inactivity on the part of consumers can hardly be explained. Much coal is coming to town but the larger part of it appears to remain on the tracks.

Coke.—There is rather a better demand, due to better business condition in iron and steel trade. Prices are fair but there is no great strength.

Pittsburg.

Feb. 25.

(From Our Special Correspondent.)

Coal.—The harbor and pools have been cleaned out by the late coal runs; the rivers are on the rise and a flood will be the result. The lower markets are all overstocked with coal and prices are down to a very low figure. The Pittsburg and Cincinnati coal dealers have made an amicable arrangement; it is said that prices will be advanced. Most of the boats that went out on the late rise have returned with empties that have been forwarded to the pools to be loaded. The coal operators of Cleveland and Pittsburg have begun to hustle for contracts for the lake season, which opens in May, and already some have gone to the Northwest in search of orders; these will be taken at terms that will insure the operators a profit above district mining prices. It is stated that the Conneaut Harbor Company will purchase Pittsburg coal and push it further into the Northwest.

A vein of coal has been discovered just below Altoona, Pa., in Homer Gap, on the land of the late John Berkholder. The tract consists of several hundred acres along the mountain side, near the Altoona, Clearfield & Northern Railroad, directly on the route of the proposed Beech Creek extension.

There have been some wage difficulties in the pools due to the announcement of the operators that wages in the fourth pool would be reduced from \$1.87½ to \$1.50 per 100 bu. and in the lower pools from \$2.37½ to \$2. The miners of the Monongahela held a meeting at Monongahela City. A resolution was adopted demanding \$2.30 per 100 bu. in the first three pools and \$2 in the fourth pool. Should the operators refuse to pay the price asked a strike will be declared. Some of the large operators seen said they do not care whether the miners strike or not; there is no money in the business at present prices. About 8,000 men are now idle.

Connellsville Coke.—There was a slight falling off in the demand for coke. The boom in steel rails and pig iron seems to have monopolized the whole attention, and the coke interest was neglected; the result was there was a slight falling off in shipments to the West, a decrease of 92 cars. In all 236 idle ovens were fired up, and reports are that the 743 ovens of W. I. Rainey were being made ready for firing up. The active list of all the smaller plants increased to an average of 50% when the plants are operated on a five days' basis. As to how many changes will take place at the big plants is not known; some of the larger operators are very reticent as to future plans, but a feeling of confidence is apparent with all. It looks as if there might be an increase of 2,000 to 3,000 in the active list in the near future. Summary for the week shows 10,244 ovens in blast with 8,107 idle. The production for the week, estimated upon the ovens drawn, amounted to 99,286 tons, against 95,897 tons the week previous. In the running order of the ovens 2,771 ovens made six days, 7,285 ovens made five days, 163 ovens four days, and 25 ovens seven days, an average of 5.25 days. The shipments were as follows: To Pittsburg and river points, 2,440 cars; to points West, 2,709 cars; to points East, 932 cars; total, 6,081 cars. Prices are unsettled and vary from \$1.50 per ton up.

Shanghai, China.

Jan. 15.

(Special Report of Wheelock & Company.)

Coal.—Japan coal seems to be still on the rise and very difficult to obtain. We made offers of all kinds at fair market prices, but all have been declined, there having been a further advance of 50c. on the f. o. b. price at Moji and other coaling parts, so we are compelled to put up our quotations about 10%. A slight demand existed for Cardiff a few days ago, but we are not yet aware if business took place; there has been no change in this. Sydney Wollongong is still very dull, and it seems remarkable that it should be so, as with the present greatly enhanced prices of all kinds of coal one would think this would follow in sympathy, but our deliveries are smaller than ever.

We quote nominal prices as follows: Cardiff, 13 taels per ton; American anthracite, 9 taels per ton; Sydney Wollongong, 6.75 taels per ton. Japan coal is 5.75 taels for Takasima lump, 5 taels for Namazuta lump and 4.75@5 taels per ton for other sorts.

Kerosene Oil.—During the past fortnight there has been a very large business, but chiefly confined to buying and selling Devos's; the prices have varied considerably, sales taking place at 1.65@1.61 taels per case, the latter being the present value. Russian has not commanded much attention, very likely on account of the very small stock of case oil. There are buyers of this brand, but first hands are not tempted by the prices offered. For Langkat there is little or no demand. There have been ar-

rivals during the week of 165,600 cases Devoe's, 88,000 cases Russian and 34,500 cases Langkat. Quotations are as follows, per case: American Devoe's, 1.61 tael; Russian Batoum, 1.57½ tael; Russian Batoum, bulk, 1.52½ tael; Langkat, 1.57½ tael.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Feb. 26. 1897

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From	
	Feb. 23, 1896.	Feb. 26, 1897.	Jan., '96.	From Jan., '97.
Anthracite.	55	35,435	31	18,600
Coke.	140	166,830	106	141,800
Charcoal.	20	5,425	19	5,750
Totals.	215	207,690	156	166,150

	Tons.	Tons.
	304,268	154,296
	1,465,349	1,127,914
	43,350	47,336
	1,812,967	1,329,536

Attention continues to be absorbed almost entirely by the steel rail situation. This has quieted down somewhat and some of the lowest prices made at first have been withdrawn, so that prices may be fairly said to stand about \$18@20 per ton at mill. Nobody knows yet just how many tons of rails have been contracted for, but it is enough to keep the mills busy and to make demand for Bessemer pig active for some time to come. The sale of 1,000,000 tons of finished material in a week must naturally cause some excitement; what the effect on the general iron market will be is a little uncertain as yet, but so far the rest of the trade has simply looked on at the rail fight and done nothing. The mills are now supplied with work for several months to come and at prices which will pay them, if they are low; and so far that is a gain, inasmuch as it will give employment to many men and furnish a market for much raw material.

The export sales reported last week also give rise to a great deal of comment, but the particulars are not attainable. Some comment on these sales is to be found in our editorial column. To the list of foreign orders is to be added 70,000 tons of rails for the Canadian Pacific Railway, taken by the Carnegie Steel Company at a price said to be under \$17 at mill.

There are some signs of an increased demand for bridge and structural material, and the mills are looking forward hopefully to next month.

A meeting of the Lake Iron Ore Pool was held in Cleveland this week, but only some preliminary work was done. An adjournment was had until Monday next, March 1st, when committees will report, and some action will probably be taken as to the renewal of the agreement and prices for the season.

New York. Feb. 26.

The local market continues quiet, and inquiries received are said to be only "feelers." The demand for steel rails here has fallen off somewhat. Bids are now being received for about 40 miles of 90-lb. steel rails needed in extending street railroads in Brooklyn, N. Y. The Pencoed Iron Works, of Philadelphia, has received the contract for the Union Pacific viaduct to carry tracks over leading thoroughfares in Omaha. It is said the contract amounted to \$100,000, and the iron must be delivered by May 1st.

The Boston Water Works have let a contract for 17,000 tons of cast-iron pipe. The successful competitor and the price will not be known until next week. There have been several inquiries for electrical plants for export, and the South American countries continue to send orders for manufactured iron and steel. Several mining plants have been fitted out by concerns here within the last few months.

Pig Iron.—Locally the market is quieter than last week, and orders received are for small lots. Prices, while showing little change, can no doubt be shaded. Some favorable inquiries have been received from abroad for Southern pig iron. Orders for prompt delivery are being taken only sparingly as the necessary transportation cannot be secured at figures demanded by the seller. The furnace companies calculate on \$3@3.50 per ton as freight rate to Europe, but vessel owners are now looking for more money.

The Low Moor Iron Company, of Virginia, has made a sale of 2,000 tons of No. 3 foundry iron to the Walworth Manufacturing Company, of Boston, Mass. This is the second lot of this grade which has been sold within a year. The price received for the present lot of iron is said to be 50c. below the current quotations. Delivery will be made by rail and water.

Quotations for Northern brands are \$12@12.50 for No. 1 foundry; \$11.50@11.75 for No. 2 foundry; \$10.75@11 for No. 2 plain, and \$10.50@11 for gray forge. For Southern iron we quote: No. 1 foundry, \$11.50@12; No. 2 foundry, \$10.75@11; No. 3 foundry, \$10.25@10.75; No. 1 soft, \$10.75@11; No. 2 soft, \$10.50@10.75; forge, \$10.25@10.50; basic pig, \$10.50@10.75. All prices are for tidewater delivery.

Cast Iron Pipe.—Orders are chiefly for small quantities, and prices are being shaded. The Boston contract is referred to above.

Spiegeleisen and Ferro-Manganese.—There is but little demand, and prices are \$46@47 per ton for imported 80% ferro-manganese and \$19@19.50 for 20% spiegeleisen.

Steel Billets.—Demand is spasmodic. Prices are \$15@16 per ton at mill.

Merchant Iron and Steel.—Business is quiet and sales are small. For bars we quote: Common, 1.05@1.10c.; refined, 1.10@1.25c.; soft steel bars, 1.15@1.25c. Other quotations are: Steel hoops, 1.40@1.45c.; steel axles, 1.65@1.75c.; links and pins, 1.60@1.70c.; tire steel, 1.70c.; spring steel, 1.95@2.15c. All prices are for delivery on dock New York.

Plates.—Business continues light and we quote for universal mill plates 1.20@1.30c. For steel plates prices are: Tank, 1.20@1.30c.; boiler shell, 1.35@1.45c.; flange, 1.45@1.55c.; firebox, 1.65@1.75c., according to quality. Charcoal iron plates are 2.25c. for shell, 2.75 for best flange and 3.25 for firebox. Rivets are 3@3.25c. for iron and 2.10@2.25c. for steel. Prices are for tidewater delivery.

Structural Iron and Steel.—Business is still small in volume and we quote for angles, 1.20@1.30c.; tees, 1.60@1.70c.; channels, 1.70@1.80c. The price of beams, New York delivery, is 1.70c. for ordinary sizes, 1.85c. for 20-in., and 1.95c. for 24-in., large lots. For small quantities 0.10@0.25c. higher are asked.

Steel Rails and Rail Fastenings.—Standard section steel rails are quoted at \$18@20 at mill. Quotations for rail fastenings are, angle-bars, 1.15@1.25c.; spikes, 1.00@1.05c.; bolts, 1.85@1.95c. for square nuts and 1.90@2c. for hexagon nuts.

Wrought Iron Pipe.—Business continues quiet. Discounts are as follows for plain pipe, out of store: 1½ in. and over, 67, 10, 10, 10 and 10%; 1¼ in. and under, 57, 10, 10, 10 and 10%. Galvanized pipe, 1½ in. and over, 55, 10, 10, 10 and 10%; 1¼ in. and under, 50, 10, 10, 10 and 10%. For fair sized orders these discounts are made with an additional 5%. Boiler tubes, 1 in. to 2¼ in., 70, 10 and 5%; 2¼ in. up, 75 and 5%. Cold-drawn seamless steel tubes, 60%.

Nails.—But few sales were made this week, and prices show little change. Wire nails are quoted at \$1.60@1.65 per keg in New York, and cut nails \$1.40@1.50, same delivery.

Old Materials.—The market has settled somewhat, and sales have been made in fair quantities. Exports continue to be made, and inquiries are still coming in from this source. Old iron rails are quoted at \$12@13, and old steel rails command \$10.50@11. O.d wrought-iron pipe is quoted at \$7.50@8 per ton.

Cast Scrap.—Demand is principally for railroad material and prices for good machinery scrap are \$9.50@10.50 per ton; ordinary cast scrap, \$8@9.50; stove-plate and mixed, \$6.50@8. Old car wheels are \$9.50@10.50 per ton.

Chicago. Feb. 24.

(From Our Special Correspondent.)

Pig Iron.—The market for pig iron has improved somewhat, a number of fair-sized sales having been made during the week. Inquiry has increased and it looks as though dealers here would soon have a very good trade. The tonnage of the week, though not large, represented a better aggregate than the preceding week. The present price of pig iron and the better industrial prospect have undoubtedly influenced trade. It is hardly possible that pig iron will be bought so cheap in a few weeks; in fact it has already reached bottom. We quote: Lake Superior charcoal, \$13.50@14; local coke foundry No. 1, \$11.50@12.00; No. 2, \$11.00@11.50; No. 3, \$10.75@11; local Scotch foundry No. 1, \$11.50@12; No. 2, \$11@11.50; No. 3, \$10.75@11. Southern coke No. 1, \$11.15@11.40; No. 2, \$10.65@11.15; No. 3, \$10.40@10.65; Southern No. 1 soft, \$10.90@11.40; No. 2 soft, \$10.65@10.90; Jackson County silveries, \$14@16; Ohio silveries No. 1, \$15@15.50; Ohio silveries No. 2, \$14.50@15.00; Alabama car wheel, \$16@16.50; coke Bessemer, \$13.25@13.75.

Bar Iron.—Small lots have been in fair demand, with an occasional order for quantity of fair size. Inquiries have been a trifle better, chiefly from makers of car material. Prices are for common iron 1.25@1.30c.

Steel Rails.—The demand for rails has abated, and the sales of the week were therefore nothing in comparison with those booked during the two previous weeks. Authority has it that the Illinois Steel Company books very large orders in price of from \$17 to \$21 per ton. Railroads that have not placed orders during the past few weeks are few, and those that have ordered have done so on a large scale. Rails are now quoted at \$21.

Billets and Rods.—There has been but little change in billets, the demand being limited to small lots. Rods are in small demand. Billets are quoted \$18 and rods \$24.

Structural Material.—There has been more inquiry and business looks brighter. Some good-sized buildings about the city are planned, and material is wanted for constructing elevated way in the city for one of the big railroads, the Great Northern; 5,000 tons will be needed by the road. Prices have not stiffened as yet, and are: Beams and channels, 1.70@1.80c.; plates, 1.25@1.30c.; angles, 1.25@1.30c.; tees, 1.50@1.55c.

Cleveland. Feb. 23.

(From Our Special Correspondent.)

Iron Ore.—The market has been very quiet during the past week. A few tons of ore have been sold to supply immediate demands; the transactions, how-

ever, have been very light. Uncertainty as to what will be done by the Western Ore Association, which will hold a meeting in Cleveland next Monday, is in part the cause for the present condition of the market. A preliminary meeting of the association was held here last Monday, when prices were discussed informally. The impression prevails among brokers that the prices this year will be somewhat lower than those of 1896, but higher than those of 1895. Until the meeting is held Monday and the prices fixed for the year, however, it is thought there will not be much business transacted. The sales which were made during the past week were at the old rates, which follow: Standard hard speculars, Bessemer quality, \$4.50@5; standard hard hematites, Bessemer quality, \$4@4.50; standard hematites, non-Bessemer quality, \$3.50@4; standard soft hematites, non-Bessemer quality, \$2.50@3.25.

Pig Iron.—The pig-iron market has been quite firm during the week past, but the actual business done was small. A strong market is true of all grades of iron, and the indications are that the price of Bessemer will advance. Following are the quotations: Lake Superior charcoal, \$13.50; Bessemer, \$11@11.25; No. 1 Foundry, \$11.65; No. 2, \$11.15; No. 1 Ohio Scotch, \$11.15; No. 2, \$10.65; Mahoning and Shenango Valley neutral mill irons, \$9.75@10; Mahoning and Shenango Valley red short mills, \$9.75@10.

Philadelphia. Feb. 26.

(From Our Special Correspondent.)

Pig Iron.—The week's sales have been larger than for any single week for months, but there is no hardening of values and no probability thereof with the large stock of available iron in this State, Virginia and farther South. The only anxiety now is to make big sales at current rates. Even the possibility of higher prices does not check efforts to sell, much as that possibility was talked about early in the year. A goodly number of inquiries is in hand to-day, and will most likely result in orders within a few days. The activity in Bessemer in the West is reflected here. Twenty thousand tons of iron were sold late last week in two lots. No. 1 foundry is \$13; No. 2 is \$12; forge, \$11, with variations, both ways according to circumstances. Bessemer is \$13, and low phosphorus, \$17.

Steel Billets.—The activity in Western Pennsylvania is reflected here in advancing quotations, the result of which has been the placing of large lots in nearby mills. The average quotation is \$17.75 to-day, and agents think bottom price next week will be \$18. There is quite a stir in billets, and heavy buying is probable.

Merchant Iron.—Despite the renewal of offers since last week by bar-iron makers of shaded quotations, rather than to reduce production, no large orders have been placed, and from to-day's reports none are expected. The bar-iron makers have reason to complain. The workmen's complaints do not reach print. Large lots of iron could be had at a shading from 1.15c., which leaves only the shadow of a margin.

Sheets.—The dullness has forced some exceptional shadings within 48 hours, which means that the mills will start in with more business in a few days.

Pipes and Tubes.—The same remarks apply to this branch. Business is poor, and as a result prices are off.

Merchant Steel.—New business is rather encouraging to those who are accustomed to retail trade. The prospects are good for this branch. The handlers of merchant steel orders do not care to give actual quotations.

Plate and Tank.—The number of new inquiries all point to larger orders very soon. Matters are getting into shape for business. Contractors and constructing engineers are inquiring for material and arranging for business. Tank is 1.25c.; universal, 1.30c.; shell, 1.35c.; flange, 1.50.

Structural Material.—In this connection it might be remarked that three large office buildings are to be erected—one of 16 floors on corner of Broad and Chestnut. Quite a number of small sales will come in during March. Angles are 1.20c.; beams and channels, 1.70c. and up.

Steel Rails.—The rush appears to be over, and the anxiety now is as to what those railroad companies will do who have had schemes of extension on hand. If these schemes are prosecuted there will be an abundance of work and a further hardening of values. Prices are \$18@19.

Old Rails.—Old iron rails have sold in a moderate way at \$13.50. Old steel rails are offered at \$12 and less.

Scrap.—The scrap people are encouraged at the business done during the past few days, but it is not of such force or momentum as to affect prices favorably for them. Railroad is \$12@13. The mass of scrap at the fire at Thirteenth and Market streets is being hauled away. Shop scrap is hard to sell but spring stuff is wanted.

Pittsburg. Feb. 25.

(From Our Special Correspondent.)

Raw Iron and Steel.—The preceding week was a very eventful one and will long be remembered by iron and steel merchants; the fact is we are making history rapidly. Business was active and prices steadily advancing on raw and finished products; the market has been very exciting. The

spring trade is now in full bloom and very large operations will be the rule from this time on. The sales of Bessemer pig by the Valley furnaces last week were very large, aggregating 64,500 tons at \$10@10.25, principally at \$10.10; also 2,500 tons at \$10.50 and 1,000 tons at \$10.45. The latter figures are the highest reached for Valley iron for a long time. These sales will undoubtedly start the furnaces on full time. Pittsburgh furnacemen held off, refusing to accept present prices; the wisdom of that decision is now apparent. According to the best sources of information, during the last 30 years, there has never been so early in the season an awakening like the present, and it is confidently predicted that there will be more business than any one year the last 10 has seen. The breaking up of the steel pool has marked the beginning of the wave of activity, and will, it is asserted, have an influence for good extending not only through all the trade itself, but into the allied trades. The next important point for the iron and steel men is the ore question; a meeting of the pool was to be held this week. The only way they can expect to hold together is by reducing prices; will they do it? That is now the important question. So far, we have learned of no transactions. Reports are current that the pool is on the verge of dissolution.

The Pennsylvania Railroad will in a few days be on the market, it is reported, for 40,000 tons of rails; the order will be divided among the mills along its lines.

Most of the mills and furnaces along the Monongahela had to suspend operations on account of the flood. The big Edgar Thomson plant had to suspend altogether. The water is now subsiding and work will be resumed in a day or two. The destruction of property will exceed \$1,000,000.

The iron and steel market is firm with a good demand; prices are still on the up-grade. One sale of 25,000 tons Bessemer at Valley furnace was closed on Saturday at \$10; the price now is above that figure. Steel billets sold \$15.50@16. A sale of 15,000 tons is now under negotiation. The general outlook is favorable.

COKE, SMELTED, LAKE AND NATIVE ORE.	Tons.	Cash.
10,000 Bessemer, Mar., April, May, June, Valley...	1,500	\$15.75
5,000 Bessemer, April, May, Valley...	50	\$23.00
5,000 Bessemer, Mar., April, May, Valley...	50	\$15.60
4,000 Bessemer, Mar., April, Pitts...	25	\$23.00
3,500 Bessemer, April, May, Pitts...	550	\$1.25 4 m.
3,000 Bessemer, April, May, Valley...	500	\$1.10 4 m.
2,500 Bessemer, Valley...	400	\$1.10 4 m.
2,000 Bessemer, Feb., Mar., Valley...	500	\$1.05 4 m.
2,000 Bessemer, Mar., April, Valley...	350	\$1.05 4 m.
2,000 Bessemer, Mar., April, Valley...	300	\$1.05 4 m.
2,000 Bessemer, April, May, Valley...	550	\$1.19 50
1,500 Bessemer, Mar., April, Pitts...	1,000	\$12.00
1,000 Bessemer, Mar., Valley...	3,000	\$21.00
1,000 Bessemer, Feb., Valley...	1,000	\$11.00
1,000 Bessemer, Valley...	1,000	\$19.00
500 Bessemer, Mar., Valley...	200	\$46.00
500 Bessemer, spot, Pitts...	300	\$10.50
500 Mill Iron, Pitts...	100	\$11.00
500 Bessemer, Mar., Pitts...	100	\$12.00
300 No. 1 Foundry, Pitts...	300	\$11.50
200 No. 2 Foundry, Pitts...	200	\$10.90
200 Bessemer, Mar., Pitts...	100	\$12.00
3,000 Billets, March, April, May, June, Pitts...	100	\$6.75
3,000 Billets, April, May, Pitts...	100	\$6.00

METAL MARKET.

NEW YORK, Friday Evening, February 26, 1897.

Gold and Silver.
Prices of Silver per Ounce Troy.

February.	St. Ex.	London	N. Y. Cts.	Value of sil. in \$.	February.	St. Ex.	London	N. Y. Cts.	Value of sil. in \$.
20	1.87	29 3/4	61 3/4	.500	21	4.87	29 3/4	61 3/4	.501
22	1.87	29 3/4	61 3/4	.500	25	4.87 1/2	29 3/4	61 3/4	.501
23	1.87	29 3/4	61 3/4	.500	26	4.87 3/4	29 3/4	61 3/4	.501

Silver business has been steady. London has taken silver freely at 29 3/4 d. both on continental and India account. Orders, however, have been satisfied, and at this writing the market is dull at 29 1/4 d., and without feature.

The United States Assay Office in New York reports the total receipts of silver at 75,000 oz. for the week.

Average Monthly Prices of Silver

In New York and London, per ounce Troy, from January 1st, 1897, and for the years 1896 and 1895.

Month.	1897.		1896.		1895.	
	Lon- don.	New York.	Lon- don.	New York.	Lon- don.	New York.
	Pence.	Cents.	Pence.	Cents.	Pence.	Cents.
January	29 7/4	61 7/8	30 6/8	67 1/8	27 3/8	59 6/8
February	29 6/8	61 6/8	31 0/1	67 6/8	27 4/7	59 9/10
March	29 3/4	61 3/4	31 3/4	68 4/0	28 3/3	61 9/8
April	29 3/4	61 3/4	31 10	67 9/2	30 3/9	66 6/1
May	29 3/4	61 3/4	31 0/8	67 8/5	30 6/1	66 7/5
June	29 3/4	61 3/4	31 4/6	68 6/9	30 4/7	66 6/4
July	29 3/4	61 3/4	31 4/5	68 7/5	30 4/8	66 7/5
August	29 3/4	61 3/4	30 9/3	67 3/4	30 4/0	66 6/1
September	29 3/4	61 3/4	30 19	65 6/8	30 5/4	66 9/10
October	29 3/4	61 3/4	29 6/8	65 6/5	30 8/9	67 6/4
November	29 3/4	61 3/4	29 4/6	64 9/8	30 7/9	67 4/2
December	29 3/4	61 3/4	29 7/0	65 2/4	31 4/0	66 4/7
Year			30 6/7	67 0/6	29 5/3	65 2/8

The New York prices are always per fine ounce, or ounce of pure silver; the London quotation is per standard ounce, or for metal 925 fine.

Gold and Silver Exports and Imports.

At all United States ports, January, 1897, and years from January 1st, 1897 and 1896:

Coin and bullion.	Exports.		Imports.		Total ex-cess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
Jan.	\$371,944	\$556,621	\$70,411	\$209,055	I. \$232,321
1897..	371,944	556,621	70,411	209,055	I. 323,321
1896..	10,566,526	10,367,910	5,002	179,012	E. 24,576
SILV.					
Jan.	3,997,754	877,067	156,993	1,875,150	E. 1,402,440
1897..	3,997,754	877,067	156,993	1,875,150	E. 1,402,440
1896..	4,903,299	1,057,597	85,400	1,433,622	E. 2,497,480

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York
For the week ending February 26th, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

	Gold.		Silver.		Total Ex-cess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Week	\$179,195	\$191,300	\$922,550	\$65,621	E. \$844,84
1897..	520,351	481,875	6,365,304	358,095	E. 6,045,685
1896..	9,748,885	15,856,866	6,434,145	277,015	E. 49,149
1895..	25,846,578	6,369,374	5,097,202	215,811	E. 24,358,592
1894..	3,528,470	2,265,781	8,381,158	247,280	E. 9,456,567

Of the gold exported \$128,245 went to France and the balance to the West Indies; the silver went to London. The gold and silver imported came chiefly from Central and South America.

FINANCIAL NOTES OF THE WEEK.

Business continues to show some signs of improvement, but is still far from what it should be at this season. The heavy exports, present and prospective, are helping affairs somewhat, but trade should not depend as much on export conditions as it is doing at the present time. Money continues abundant in New York, but there has been some falling off in the receipts from the in erior, and the banks are not quite so much overloaded with funds they cannot use.

No currency legislation was expected at the present session of Congress, and very little is expected of the extra session, which, it is generally understood, will be called in March. Business men are not by any means pleased at this prospect, nor are they disposed to be thankful for the extra session which may last all summer, and is especially inopportune with Cuban affairs in their present critical condition.

We used to pride ourselves over our exemption from the war scares which periodically affect the European markets. We can do so no longer; sensational newspapers and unscrupulous politicians are doing their best to reduce us to a worse condition than any foreign market can complain of.

The gold reserve of the United States Treasury continues to increase, and will soon reach \$150,000,000, unless something now unforeseen should prevent. We have before called attention to the influence which our gold production, now amount-

ing to about \$5,000,000 per month, must have. No gold is going abroad, and there is no probability of shipments for some time to come.

Mr. C. Stuart Patterson, chairman of the Indianapolis Monetary Convention, was directed to appoint an executive committee of 15 to continue the work of the convention, and in particular to bring before Congress and the country the subject of the appointment of a Currency Commission. Mr. Patterson, on February 25th, announced the appointment of the following members of the committee, all of whom have accepted: H. H. Hanna, Indianapolis, chairman; M. L. Crawford, Dallas, Tex.; W. B. Dean, St. Paul, Minn.; John W. Fries, Salem, N. C.; J. F. Hanson, Macon, Ga.; C. C. Harrison, Philadelphia, Pa.; Rowland Hazard, Peacedale, R. I.; John P. Irish, Sacramento, Cal.; H. H. Kohlsaat, Chicago, Ill.; J. J. Mitchell, Chicago; Alexander E. Orr, New York; George Foster Peabody, New York; T. C. Power, Montana; E. O. Stanard, Missouri, and A. E. Willson, Kentucky.

The statement of the United States Treasury on Thursday, February 25th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	Feb. 18.	Feb. 25.	Changes.
Gold	\$146,969,923	\$148,244,989	I. \$1,275,066
Silver	20,698,766	19,784,879	D. 913,887
Legal tenders	9,536,286	9,113,301	D. 422,985
Treasury notes, etc.	33,208,155	32,952,521	D. 255,634
Totals	\$209,873,110	\$210,095,990	D. \$22,880

Treasury deposits with national banks amounted to \$16,186,503, a decrease of \$385,256 during the week.

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$117,550,280. Against these are held in the Treasury \$9,158,048 coined standard silver dollars and silver bullion purchased at a cost of \$108,392,232, making a total of \$117,550,280.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending February 20th, gives the following totals, comparisons being made with the corresponding weeks in 1896 and 1895:

	1895.	1896.	1897.
Loans and discounts	\$482,615,000	\$457,795,800	\$438,747,000
Deposits	528,559,900	458,732,800	573,670,600
Circulation	11,929,600	13,386,400	16,613,400
Reserve:			
Specie	74,438,700	63,920,900	82,817,000
Legal tenders	87,526,000	87,139,300	116,016,600
Total reserve	\$161,964,700	\$151,060,200	\$198,833,600
Legal requirement	132,639,675	122,433,100	145,167,650
Surplus reserve	\$29,325,025	\$28,627,050	\$55,665,950

Changes for the week this year were increases of \$4,595,500 in deposits, \$2,624,500 in specie, \$2,552,100 in legal tenders, and 4,027,725 in surplus reserve; decreases of \$1,920,100 in loans and discounts, and \$110,100 in circulation.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars and comparison is made with the holdings at the corresponding dates last year:

	Gold.	Silver.	Total.
Asso. Banks of New York			\$82,817,000
1896			63,920,900
Bank of England	\$195,147,700		195,147,700
1896	215,610,065		215,610,065
Bank of France	383,293,000	\$248,686,200	631,979,200
1896	390,877,260	248,108,683	639,985,943
Imp. Bank of Germany			226,965,000
1896			238,055,000
Austro-Hungarian Bank	153,298,000	63,350,000	216,648,000
1896	123,985,000	64,060,000	188,045,000
Netherlands Bank	13,169,000	34,607,000	47,776,000
1896	14,632,000	34,435,000	49,067,000
Belgian National Bank			21,201,000
1896			20,011,000
Bank of Spain	42,642,000	54,443,000	97,085,000
1896	40,022,000	51,292,000	91,314,000
Bank of Italy	59,780,000	11,985,000	71,765,000
1895	59,860,000	9,950,000	69,810,000
Imp. Bank of Russia	518,355,000		518,355,000
1895	395,035,000		395,035,000

The return for the Associated Banks of New York is of date February 20th; all the others are of February 25th, except the Bank of Italy, December 10th, and the Bank of Russia, December 16th-23th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Shipments of silver from London to the East for the year up to February 11th are reported by Messrs. Pixley & Abell's circular as below:

	1896.	1897.	Changes.
India	£320,998	£504,600	I. £183,602
China	47,900	19,550	D. 28,350
The Straits	55,290	28,800	D. 26,490
Totals	£424,098	£552,950	I. £128,852

Arrivals for the week this year were £177,000 in bar silver from New York, £2,000 from Australia, and £41,000 from Chile; also £16,000 in Mexican dollars from New York; a total of £236,000.

Indian exchange has been sustained by the scarcity of money in India and the demand for remittances to the banks, whose cash balances have been drawn very low.

The foreign merchandise trade of Great Britain in January is given in the Board of Trade returns as below:

Table with 4 columns: Imports, Exports, Excess imports, and values for 1896 and 1897.

There was an increase of 3.9% in imports, but a decrease of 6.5% in exports. The movement of gold and silver for the month was as follows:

Table showing Gold and Silver imports, exports, and excess for 1896 and 1897.

Of the silver imported this year £830,268 came from the United States. The gold movement shows a heavy decrease this year.

Prices of Foreign Coins.

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

Table listing prices for Mexican dollars, Peruvian soles, Victoria sovereigns, Twenty francs, and Spanish 25 pesetas.

Other Metals.

Copper.—The market has been very dull and very little business has been done. Manufacturers are still well supplied with copper and complain that orders do not come in as fast as they would like to see them.

The speculative market in London was rather dull, and the fluctuations were small and unimportant. G. m. b.'s are slightly lower than last week, £51 2s. 6d. at £51 5s. for spot, and £51 10s. at £51 12s. 6d. for three months prompt.

Tin.—For a few days during this week there was an active demand for spot tin, for which a slight premium was bid. This delivery is again rather scarce, but as the quantities are fairly large little fear is entertained that spot tin will be cornered.

In London rather a large business has been done at slightly higher rates than were obtained last week. The market opened firm at £61 2s. 6d. at £61 5s. for spot, advanced afterward to £61 12s. 6d., but later on, prices again gave way, and the closing quotations are £61 2s. 6d. at £61 5s. for spot and £61 15s. at £61 17s. 6d. for three months prompt.

Lead.—The firmness in lead continues, and again large transactions were recorded at very full prices earlier in the week, and at the close still higher values have been established. It is now quite evident that stocks in the West are entirely exhausted, and most refiners are sold out for some little time ahead.

In London lead has been rather dull, and only a small business has been done. Spanish lead is quoted £11 12s. 6d. at £11 13s. 9d., and English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead continues strong and fairly active. The last sales are on a basis of 3'07 1/2 @ 3'10c. for Missouri brands

and 3'12 1/2 @ 3'15c. for corroding and argentiferous lead.

Spelter continues somewhat irregular, but prices are rather higher, and we have to quote 4'07 @ 4'12 1/2 c. New York. The foreign market is rather easier, and good ordinaries in London are quoted £17 7s. 6d. and specials £17 12s. 6d.

Antimony is dull and neglected. Cookson's is 7 1/2 c.; U. S. Star, 7c.; Hallett's, 7c.; and Japanese, 6 1/2 c.

Nickel.—Business is fair and prices are firm. We quote for ton lots 33 @ 36c. per lb., with 37 @ 39c. for smaller orders. London prices are steady at 14 @ 15d. for large orders and 15 @ 16 1/2 d. for small lots. The New York price is about on a parity with London, allowance being made for the duty of 6c. per lb. here. The Paris quotation is 4 fr. per kilo, equivalent to about 36c. per lb.

Platinum.—There is a strong feeling and prices are firm at \$14.50 @ \$15.50 per oz., New York. London quotations are 57s. 6d. @ 59s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotations, the prices given being respectively for orders of over 250 grams, for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 52c., 54c. and 56c. per gram. Wire and foil are 49c., 50c. and 51c. per gram. The current retail price for crucibles is 60c. per gram.

Quicksilver.—The New York quotation continues at \$38 per flask. The San Francisco price is \$37.50. The London quotation continues at £2 17s. 6d. per flask, with £2 16s. 3d. named from second hands.

The Minor Metals.—Quotations for these metals are given in the table below, the prices being for New York delivery:

Table listing prices for various minor metals like Aluminum, Ingots from scrap, Rolled sheets, etc.

Variations in price depend chiefly upon the size of the orders.

Average Monthly Prices of Metals

In New York, for the years 1897 and 1896; in cents per pound.

Table showing average monthly prices for Copper, Tin, Lead, and Spelter from Jan to Dec for 1897 and 1896.

Imports and Exports of Metals.

Table showing imports and exports for Baltimore and Philadelphia for various metals like Bismuth metal, Chrome ore, Copper, etc.

**From our special correspondent.

Table showing imports for Philadelphia for Antimony, Copper, Ferro-manganese, Ferro-silicon, Iron ore, etc.

**From New York Metal Exchange Reports.

New York. Table with columns: Expts., Impts., Expts., Impts. for various metals like Aluminum, Antimony ore, Brass, etc.

*Metal Exchange Reports.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Feb. 26.

Heavy Chemicals.—No material change can be reported in heavy chemicals, though quite a number of small orders are being received and filled. There is some talk of lowering prices, but as yet it is impossible to say what the outcome will be.

Acids.—Resumption of wool and cotton and one or two print works has resulted in more inquiry for spot supplies of acids and other chemicals, but as these concerns are as yet consuming stocks in hand, no real business has come from them.

Brimstone.—The quiet condition of this market continues, the demand having fallen off very much. Prices also are down, best unmixed seconds on spot being quoted at \$20 1/2 per ton.

Fertilizing Chemicals.—Little can be said of trade in this line during the past week. There has been a little buying and the market remains very quiet.

Sulphate of ammonia, gas liquor, \$2.22 1/2 for shipment, and \$2.25 for spot; bone, \$2.05 @ \$2.10 per 100 lbs. Dried blood, high grade Western, \$1.80 per unit New York; f. o. b. Chicago, \$1.50 @ \$1.52 1/2 per unit; low grade, fine ground, Western, \$1.47 1/2 @ \$1.50 f. o. b. Chicago.

Muriate of Potash: We quote: 1.75c. at New York and Boston, 1.76 1/2 c. Philadelphia, Baltimore and Norfolk, and 1.81 1/2 c. Charleston, Savannah, Wil-

mington and New Orleans, for 80@85% basis of 80%, in lots of 50 tons and upward.

Kainit.—Invoice weights, as taken at port of shipment, per ton of 2,240 lbs., testing 12.4% actual potash, equivalent to 23% sulphate of potash, \$8.55. Actual weights, ex-vessel at port of New York per ton of 2,240 lbs. (testing as before), \$8.80.

These prices for the potash salts and kainit are for contracts made before April 1st; after that date they will be 3c. per 100 lbs. higher.

Nitrate of Soda.—Although this market is reported quiet, conditions are very much stronger and prices have increased. On spot, 1.92½@1.95c. is asked; to arrive, near due, 1.87½c., and for futures, 1.82½c.

NOTES OF THE WEEK.

The total shipments of Florida phosphates from all ports in January, 1897, as reported by the *American Fertilizer*, were 29,021 long tons, of which 20,630 tons were pebble, and 8,391 tons hard rock phosphates.

Charleston, S. C.

(From Our Special Correspondent.)

The shipments of phosphate rock from this port for the months of November, December and January were as follows, comparison being made with the corresponding period one year and two years ago:

	1895.	1896.	1897.
November.			
Crude rock (2,240 lbs.).....	9,142	16,347	15,669
Ground rock (2,000 lbs.).....	.....	.....	.....
Total.....	9,142	16,347	15,669
December.			
Crude rock (2,240 lbs.).....	18,405	20,757	14,045
Ground rock (2,000 lbs.).....	.....	134	.....
Total.....	18,405	20,891	14,045
January.			
Crude rock (2,240 lbs.).....	12,630	13,154	6,775
Ground rock (2,000 lbs.).....	.....	135	.....
Total.....	12,630	13,289	6,775

The shipments for January, it will be noticed, were exceptionally small, showing a decrease of 6,514 tons from the previous year, and a decrease of 5,855 tons from those of two years ago.

Liverpool.

Feb. 16.

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

There is not much change to report in the position of heavy chemicals, and the demand is still far from satisfactory. Last week, Brunner, Mond & Company declared a dividend for the six months ending December 31st last, of 20s. per share on the ordinary £10 fully paid shares. This is equivalent to 20% per annum, and although a handsome return, it is a decrease on the previous half year, which was at the rate of 30% per annum.

Soda ash is in light request. Quotations vary considerably according to export market, and nominal range for tierces may be called about as follows: Leblanc ash, 48%, £4@£4 5s. per ton; 58%, £4 5s. @£4 10s. per ton, net cash. Ammonia ash, 48%, £2 15s. @£3 10s. per ton; 58%, £3 @£3 15s. per ton, net cash. Bags 5s. per ton under price for tierces. Special terms are quoted for American business.

Soda crystals are quiet at £2 5s. @£2 7s. 6d. per ton, less 5% for barrels and 7s. for bags.

Caustic soda is meeting with a better inquiry, and is a shade firmer, most of the second-hand parcels being cleared off the market. We quote spot range, as to market, about as follows: 60%, £6 2s. 6d. @£6 5s. per ton; 70%, £7 2s. 6d. @£7 5s. per ton, net cash; 74%, £8 2s. 6d. @£8 5s. per ton; 76%, £8 15s. @£9 per ton, net cash.

Chlorate of potash is weak, at 3¼d. @4d. per lb., and difficult to find buyers.

Bicarb. soda is firm at £6 15s. per ton, less 2½% for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

Bleaching powder is inactive, at £6 15s. @£7 per ton, net cash, for hardwood packages, as to destination.

Sulphate of ammonia is weaker, at about £7 17s. 6d. @£8 per ton, less 2½% for good gray, 24% and 25% in double bags f. o. b. here, as to quality.

Nitrate of soda is in moderate demand, at £8 7s. 6d. @£8 10s. per ton, less 2½% for double bags f. o. b. here, according to quality.

Carb. ammonia, lump, 3d. per lb.; powdered, 3¼d. per lb., less 2½%.

Valparaiso, Chile.

Jan. 19.

(Special Report of Jackson Brothers.)

Nitrate of Soda.—Transactions during the fortnight have been large and about 1,200,000 quintals have changed hands at 5s. 8d. @5s. 9½d. alongside, for 95% January and February delivery; at 5s. 8½d., alongside, for 95% April and May shipments, and at \$4 Chilean currency, alongside, for 96% April and June delivery. A considerable advance took place in the Hamburg market for February and March delivery of 95%, which not long ago was as low as 750 marks, and during the fortnight prices have been at 7-57½@7-90 marks, receding again to 7-77½ marks, delivered terms. We quote sellers of 95% at 5s. 9d. and 96% at 5s. 11d., January and February delivery. The price of 5s. 9d., with 17s. 6d. freight, stands in 7s. 3¼d. per cwt., net cost, and freight, without purchasing commission. Sales for the fortnight amounted to 1,222,600 quintals.

MINING STOCKS.

Complete quotations will be found on pages 226 and 227 of mining stocks listed and dealt in at:

New York.	Colorado Springs.	Paris, France.
Boston.	Duluth, Minn.	Mexico.
Philadelphia.	Helena, Mont.	Shanghai, China.
Baltimore.	Salt Lake, Utah.	Valparaiso, Chile.
Pittsburg.	San Francisco.	London, England.
Cleveland.	Denver, Colo.	British Columbia.

NEW YORK, Friday Evening, Feb. 26.

The market is apathetic, and although sales have been somewhat heavy the fluctuations were small. The Comstocks were rather quiet, and only five of these stocks recorded sales this week. Consolidated California & Virginia receded 25c. to \$2, with dealings of 100 shares, Sierra Nevada declined 5c. to 35c., 200 shares being sold, while an advance of 2c. was made on Mexican with transactions of 200 shares at 42c. The Consolidated Imperial Mining Company has levied assessment No. 38 of 1c. per share, which is delinquent on March 23d.

The California stocks were slightly active, and prices steady. Syndicate changed hands at 4@5c. with sales of 800 shares, while Brunswick Consolidated rules low with transactions of 1,300 shares at 16c.

The lower-priced Colorado stocks are being inquired for quite freely, and several large orders for Cripple Creek stocks have been sent to Denver to supply the demand here. The Leadville stock, Little Chief, shows a sale of 500 shares this week at 20c. This company has struck a small body of good ore on Fryer Hill, and it is this that has caused inquiries to be made for the stock. Small Hopes, another Leadville stock which is dealt in on the Consolidated Exchange, made an advance of 8c. this week, and reports a sale of 200 shares at 60c.

The New York Mining Exchange reports total transactions for the week ending with to-day at 74,550 shares, which compare with 95,100 shares last week, a decrease of 20,550 shares. This drop in the total sales may be accounted for by the holiday this week when business was suspended. Some of the heaviest transactions took place in Russell, a gold stock of North Carolina. On Wednesday 10,000 shares of this stock were sold at 27@27½c., which is an increase in price from the opening of last week, when dealings were made at 23½@24½c. On February 25th, 9,200 shares of this stock sold at 25@28c. The Colorado stocks, outside of Cripple Creek, also record large sales. Golden San Juan shows transactions of 8,100 shares for the week at 17@18c. Elkton, of Cripple Creek, was traded in to the extent of 1,600 shares at 1.31@1.40c.

The Eagle Gold Mining Company of Colorado held a meeting in this city yesterday, and Dr. William Brandreth, the vice-president and treasurer, says that there were 900,000 shares represented out of a total of 1,000,000. The capital stock of the company was reduced to 200,000 shares at \$5 par value, and every holder of five shares of the old stock will receive one share of the new issue.

The financial statement of the Horn Silver Mining Company for the year 1896 shows that there were extracted from the property 34,219 tons of ore at a cost of \$4.51 a ton. The cost of concentration was \$1.53. The average value of the concentrates was \$26.88, and of shipping ore, \$12.93. The returns from sales of ore were \$213,543; miscellaneous receipts bring the total up to \$235,884. The balance on hand at the beginning of 1896 was \$220,744, making a total of \$456,228. The expenditures at mine, mill and office for the year were \$229,300; one dividend of \$50,000 paid out of the earnings leaves a balance of \$176,928 on hand at the close of the year. We hope to present a full abstract of the report in our next issue.

The Hope Mining Company of St. Louis has declared a dividend of 10c. per share (\$10,000), which will be payable on March 1st.

The Atlantic Mining Company will hold its annual meeting in New York on March 9th at 12 o'clock noon.

The Allouez Mining Company has called its annual stockholders' meeting in New York for March 9th.

Boston.

Feb 25.

(From Our Special Correspondent.)

The copper stocks have had their innings this week, and almost without exception prices are higher with a good volume of business all through. The firmer tone of the copper market abroad, aided by speculative influences, is the main cause of the movement. The future of the stock market depends of course mainly upon the rise or fall in the metal.

Arnold has held its own at \$3@3¼. Atlantic advanced from \$22 to \$22½. Calumet & Hecla again moved forward, this time from \$355 to \$370, the highest point yet reached. Centennial has gained from \$6 to \$6½, while Franklin sold off ¼ to \$10¼, for 25 shares, but closes to-day \$11 bid, no stock offering. Kearsarge advanced from \$18¼ to \$19¼ and off to \$18½. Osceola has been unusually active, advancing from \$32¼ to \$33¼ and receding to \$32½, closing \$32½ bid. Quincy has little movement, but advanced from \$115 to \$116½ and scrip remains at \$106. Tamarack took quite a start from \$118 to \$120, closing \$119 bid, \$121 asked. Tamarack, Junior, remains at \$18. Wolverine has varied only a fraction, from \$9¼ to \$10 and closes \$9¼.

Tecumseh shows a single sale at \$2¾, a decline of ¼.

Boston & Montana has been more than usually active, even for that stock, with a volume of sales largely beyond anything of late, and the price advanced from \$110½ to \$115½, a lot of 10 shares bringing \$115½. This is the top price to date. Butte & Boston is again in favor, advancing from \$13¼ to \$14¼, with quite an active market. Old Dominion has held very steady around \$17 to \$17½ up to to-day, when quite a raid was made on it, carrying the price down to \$15½, with sales of nearly 4,000 shares. Later the price rallied to \$16¼.

Gold stocks seem to have lost their hold on the market, or at least do not advance like the coppers. Gold Coin is off a fraction, from \$3¾ to \$3¾, closing at the latter bid. Merced advanced from \$9 to \$10¼, with considerable activity at the higher price. Pioneer advanced from \$5 to \$5½. Santa Ysabel declined from \$14 to \$13¼, and then rallied to \$13¾, a single lot selling at \$14 buyer 5, no interest.

Cleveland.

Feb. 23.

(From Our Special Correspondent.)

Mining stocks have fluctuated considerably in this city during the past week, on account of uncertainty as to what action will be taken at the annual meeting of the Western Ore Association, which will be held in this city next Monday. Republic and Jackson stocks advanced slightly, while there was a corresponding drop in the stock of Lake Superior and Chandler. A few small sales of Lake Superior and Chandler are reported.

Salt Lake City.

Feb. 20.

(Special Report of James A. Pollock.)

The dealings in the mining stock market this week exceeded in volume the excellent record of the previous period. The transactions were not confined to any special line, but were well distributed throughout the entire list. A slight advance was made by Ajax, and considerable business done in the stock. Anchor did little, but the offerings of the stock were not heavy. A greatly increased demand, based entirely upon the anticipated continuation of the recent heavy dividends, caused Bullion-Beck to advance with extreme rapidity, and at the close the stock was higher than it has been since July, 1895. Buckeye did some business at last week's figures, but was shaded slightly at the close. Centennial-Eureka has paid its February dividend of the usual amount; light offerings of the stock were noted, but prices were firm. Daly has held its annual meeting, re-elected the old officers and declared a dividend of 25c. per share, payable March 1st. The annual reports showed that after doing an immense amount of development work, including the driving of the drain tunnel through the company's ground, the treasury contains \$225,000 as a surplus fund. Daly-West has also held its annual meeting. The company has on hand surplus cash to the amount of \$10,000 and ore in the bins ready for shipment valued at \$150,000. There was a slight upward tendency to the stock and the close was very firm. Dalton & Lark did nothing, although there was some inquiry for the stock at low prices. Dalton was featureless, while Dexter sold lower than during the week before. Eagle was dull and without feature. Four Aces has not recovered. Galena continued strong at last week's figures. Outside inquiry has commenced for the new Geyser-Marion stock. Horn Silver was in increased demand, with practically no stock on the open market. Little Pittsburg was somewhat lower, an assessment of ¼c. per share having been levied to provide for development work. Mercur sold somewhat lower. There is very little stock outside of the pool, however, and nothing new was reported from the open market. Mammoth was also slightly lower. P. T. Farnsworth, manager of the Horn Silver, has been appointed manager of the Mammoth, and the change will, without doubt, prove of great benefit to the company. Northern Light did not change much, but was fairly active. Ontario was stronger, with very light offerings of the stock. Rover was not as active as during the previous week, and prices were lower. Silver King continued in good demand at strong quotations. Swansea was again lower, and the close was very weak, while South Swansea just about held its own after the dividend books closed. Sunbeam was erratic on account of different reports regarding recent developments. Sunshine was without special feature. Utah changed little.

San Francisco.

Feb. 20.

(From Our Special Correspondent.)

The market opened rather lamely, and all through the week has been dull, with falling prices. The reports from the Comstock have been somewhat indefinite, and people are growing skeptical as to the value of the new ore bodies which were said to have been opened. It is a repetition of an old story.

Some closing quotations are: Consolidated California & Virginia, \$1.90@1.95; Hale & Norcross, \$1.05; Confidence, 90c.; Ophir, 78@81c.; Chollar, 55c.; Best & Belcher, 60@63c.; Gould & Curry, 38@40c.; Yellow Jacket, 26@28c.

I omitted to note last week the final closing of the Gold Mining Exchange. It has done so little business lately that its ending attracted hardly any attention. The movement promised well for a time, but people would not take hold, and companies would not co-operate.

The American Quartz Mining Company, of Shasta County, has levied an assessment of 1c. per share, delinquent March 19th.

The Live Oak & Minnett Mining Company, of Nevada County, has levied an assessment of 1 1/2c. per share, delinquent March 17th.

The Consolidated Imperial Mining Company, of Nevada, has levied an assessment of 1c. per share.

The California Debris Commission has received new applications to mine by the hydraulic process from E. Williamson and others, in the Sunny South mine, near Indian Diggings, El Dorado County, to deposit tailings in a ravine, and from Jones & Humphrey, in their mine near Camptownville, Yuba County, to deposit tailings in Mill Creek.

The Pacific Coast Oil Company has re-elected Charles N. Felton president and Charles B. Wheaton secretary for 1897.

Spokane, Wash. Feb. 20.

(From Our Special Correspondent.)

The new Stock Exchange was opened recently in the Traders' Bank Block, Riverside avenue, with A. A. Newbery as president, C. F. Clough vice-president, H. K. Galusha treasurer, and Sidney Norman secretary. There are some 30 members, who represent many British Columbia mining stocks, especially from the Tail Creek District. The increasing attendance at the Exchange since its opening proves what a necessity it is to mining companies located in Washington and British Columbia who have offices in Spokane, and are anxious to offer their stocks to the public. Within the last few years the Northwest has made great advances in the mining industry, and this is shown most effectively by the heavy investments already made in different properties there. Spokane has large amounts invested in mining on both sides of the boundary line.

The principal offerings are of the lower priced stocks, and the directors of the exchange are continually adding new shares to its lists. The heaviest recent transactions have been in Silverine, a Trail Creek stock. On February 18th dealings in this stock amounted to 28,000 shares at 7 1/2c., with resales of 8,000 shares at 7 1/2c. February 19th, recorded among other sales 2,000 shares of Jumbo of Trail Creek at 5 1/2c., 2,500 shares of Rosslard Homestake at 8 1/2c., 200 shares of Evening Star at 13 1/2c. Today the market developed little new, the largest number of shares sold being of Reservation—5,167 shares at 8 1/2c.

The total dealings for the week ending February 20th amounted to 133,967 shares. There were sales of 4,400 shares on Monday, 9,500 shares on Tuesday, 19,700 shares on Wednesday, 75,000 shares on Thursday, 16,700 shares on Friday and 8,667 shares on Saturday, February 20th. The prices of the different mining stocks showed only slight variations during the week.

British Columbia.

ROSSLAND, Feb. 18.

Much interest is now taken in the pending legislation affecting the mineral industry of the province. The action of the United States Senate in passing the Alien Labor law with the general warlike policy of the tariff is arousing a feeling of retaliation, though it is not likely that provincial legislation at the present session will be especially hostile to American money interests here. American capital, enterprise and experience have infused life into the two great mining camps of the province, and any legislation to discourage this enterprise does not meet with general favor. The government is determined to enact a means to prevent over-capitalization and the free and unlimited flotation of paper companies. No one will regret this but the gentlemen who are particularly engaged in this branch of the mining industry. Under this provision legitimate companies will have some protection.

The first indications of spring activity have already made a commencement. The changes which the next few weeks will witness will best be appreciated after they have become realities, but on all sides the mining activity of this camp will be greater the coming spring and summer than it has ever been in the past.

London. Feb. 18.

(From Our Special Correspondent.)

The South African market has been in bad form all week. No one is inclined to buy, fearing adverse disclosures at the coming Parliamentary inquiry into the Chartered Company and the raid; so that bears have it pretty much all their own way. Many adverse rumors have been disseminated. Of course, the question of deep levels paying has been brought forward sharply. Then came rumors of a disagreement between Dr. Leyds and Mr. Kruger, with the consequent resignation of the former. Afterward it was announced that there was a serious outbreak at Johannesburg and that the Transvaal authorities had called out the military. All these causes for dullness had some truth in them, though perhaps not 10% of what the bears would have one believe; so it is no wonder that no one cared to come forward and support the market in a practical manner.

The West Australian market has suffered in sympathy with South Africans, and little of interest has happened. New Zealand has been entirely in the background, but Indians continue strong, especially as the January returns show advances all round.

The large American mines have been more in evidence than has been usual lately. The Alaska group have advanced, and buyers have come forward. On the other hand, Grand Centrals have retrograded on the lower returns for January which followed another decrease during December. The British Columbian boom has not yet arrived, though people who claim to be in the know keep stating that it will arrive soon.

The recently established West Australian Chamber of Mines has started operations, with offices at 1 Queen Victoria street, E. C. The Chamber promises to perform similar functions to those of the two Chambers of Mines at Johannesburg, publishing statistical information as to the Westralian mining industry, together with interesting facts concerning it.

A company has been floated in London called the Campana Consolidated Gold Mines, Limited. Its object is to take over the gold mines belonging to the Campana Mining Company (an Arizona corporation), situated in the district of Altar, Sonora, Mex., together with other properties in the same district. The properties appear to be developed and a 10-stamp mill in operation. The capital of the company is £200,000, of which £180,000 in shares goes as purchase price and £20,000 is to be subscribed for working capital. The Arizona directors are Messrs. L. H. Manning, Brewster Cameron and Leo Goldschmidt, all of Tucson, and the English directors are A. W. Stormont, A. J. Coleman and W. T. Todd, all of London. If any of your readers know anything of this property, they will do English investors a service by communicating their knowledge.

Paris. Feb. 14.

(From Our Special Correspondent.)

There is distinct uneasiness in the market this week over the news of a new insurrection in Crete, which is, above all things, likely to lead to unpleasant complications, the end of which it is hard to foresee. The American matter has been comfortably smothered for the present; after all a few thousand people murdered in the Asiatic mountains matters little to us. But Crete is too close to Europe to be treated in the same way. The uncertain factor in the Eastern, as in all other European, questions, is the crazy retrogradist in Berlin, whose next folly no one can foresee. That he has not been deposed long ago is only a proof of the degradation of the German people, who seem—in spite of their boasted intelligence and progress—quite given over to the cult of absolutism and aristocratic militarism. It is hard to say such a thing, but the growth of the Social Democracy seems to be their only hope of redemption.

The stock market is therefore unsettled, and so much attention has been given to the foreign securities, and especially to the Turkish bonds, which are largely held here, that mining stocks have been rather neglected and weak.

Attention is being called to the Russian petroleum stocks, which, I hear, will be introduced into our market before long. There are three prominent companies. The Societe de Napthe has a capital of 2,000,000 credit, or paper, rubles. The shares of 1,000 rubles received 20% dividend last year and sell at about 3,000 rubles. The Societe de Napthe de Nobel pays 10%; its capital is 15,000,000 rubles in 5,000 ruble shares, which are quoted about 9,900 rubles in St. Petersburg. The Societe de Napthe de Baku, with 7,000,000 rubles capital, paid last year 30 rubles on its shares of 250 rubles, which are quoted at about 550 rubles. It will be seen that they are high-priced stocks.

We have lost lately M. le Baron de Soubeyran, a financier and speculator who has been prominent for over 30 years. He was for years Deputy-Governor of the Credit Foncier and afterward founded the Banque d'Escompte and the Banque Hypothecaire. He was too speculative in disposition for a banker, and his enterprises nearly all ended in failure; but he was always picturesque and always ready with something new.

The complete figures of the census for 1896 show that in the five years from 1891 to 1896 the population of France increased only 175,027, that is, it was practically stationary. There was little loss by emigration and the result simply shows that a nation does not grow. Perhaps it will soon begin to recede.

It is a grave situation; but no one knows how it can be remedied. AZOTE.

MEETINGS.

Allouez Mining Company, annual meeting at the office of the company in New York on March 9th.

Atlantic Mining Company, annual meeting at the office of the company in New York on March 9th at 12 m.

Buchanan Gold Mining and Milling Company, at Mills Building, San Francisco, Cal., on March 6th, at 11 a. m.

Kearsarge Mining Company, annual meeting at Room 301 Sears Building, Boston, on March 16th, at 11:30 a. m.

Lackawanna Iron and Steel Company, annual meeting, at the office of the company in Scranton, Pa., on March 3d, at 2 p. m.

Oscocla Consolidated Mining Company, annual meeting at the office of the company in Sears Building, Boston, Mass, on March 11th, at 11 a. m.

St. Mary's Canal Mineral Land Company, annual meeting at the Albany City National Bank, Albany N. Y., on March 3d, at 12 m.

Tennessee Coal, Iron and Railroad Company, annual meeting at Tracy City, Tenn., on March 9th at 12 m.

MISCELLANEOUS DIVIDENDS.

American Coal Company, dividend of 4%, payable at the New York office on March 1st. Books close February 19th and reopen March 2d.

United States Oil Company, dividend of 1 1/2%, payable at the Boston office on March 15th. Books will close February 27th.

Welsbach Commercial Company, dividend of 2% payable March 10th. Books close February 27th and reopen March 11th.

ASSESSMENTS.

Name of Co.	Loc'n.	No.	Divq.	Sale.	Am
* American					
Quartz	Cal	1 Mar.	22	Apr. 12	.01
*Andes Silver	Nev	43 "	8	Mar. 31	.10
*Banner	Idaho	" "	19	" "	.29
Best & Belcher	Nev	61 "	2	" "	.25
Bogan Silver	Utah	4 Feb.	15	" "	8 .05
Bullion	Nev	49 "	18	" "	11 .10
Central Eureka	Cal	4 "	27	Mar. 23	.03
Central G. & S.	"	8 Mar.	2	" "	.02 1/2
Channel Bend	"	6 "	12	Apr. 3	.02
Confidence	"	1 Feb.	27	Mar. 20	.10
*Con. Imperial	Nev	38 Mar.	23	Apr. 13	.01
Eureka Con.	Cal	7 Feb.	26	Mar. 20	.05
Eureka Con.	Nev	14 "	23	" "	15 .25
*Golden Fleeced	Cal	19 Mar.	30	Apr. 24	2.00
Jones	Utah	28 Feb.	16	Mar. 11	.00 1/2
Julia Con.	Nev	28 "	6	" "	19 .05
Jupiter Gravel	Cal	1 Mar.	3	" "	23 1.00
*Kentucky Con.	Nev	13 "	"	" "	.65
Larkin	Cal	" "	Feb. 15	Mar. 15	.05
*Little Pittsburg	Utah	" "	" "	" "	.00 1/2
*Lone Hill	Cal	Mar.	20	Apr. 15	.01 1/2
Lucky Bill	Utah	Feb.	23	Mar. 13	.01 1/2
Occidental Con.	Nev	26 Mar.	16	Apr. 6	.10
Ophir Silver	"	70 "	10	Mar. 30	.25
*Rescue Gold	"	" "	" "	" "	.10
Reward Gold	Cal	" "	Mar. 11	" "	.02
Ridge Copper	Mich.	Feb.	16	" "	1.00
Silver King	Ariz.	16 Mar.	1	Mar. 29	.25
*Sonsby Con. G.	Utah	6 "	6	" "	23 .05
*Sunbeam Con.	Utah	8 "	10	" "	27 .01
Troy	Alaska	3 "	9	" "	25 .10
Utah Con.	Nev	24 Feb.	17	" "	8 .05
Vanderbilt	Idaho	" "	Mar. 5	" "	21 .05
*Ybarra Gold	Mex.	7 "	22	Apr. 8	.05

*New assessment.

DIVIDENDS.

NAME OF COMPANY.	Current Dividends.		Paid since Jan. 1, 1897.	Total to date.
	Date.	Am't.		
Aetna Con. Co.	Mar. 20	\$10,000	\$50,000	\$90,000
*Alaska-Mexican	" "	" "	18,000	191,031
*Alaska-Treadwell	" "	" "	75,000	3,100,600
*Anchoria-Leland	Feb. 15	\$5,000	12,000	42,000
Arizona Copper	" "	48,000	48,000	" "
Atlantic Copper	Feb. 10	40,000	40,000	740,000
*Bald Butte	" "	5,000	5,000	475,000
Boston & Montana	" 20	450,000	450,000	5,375,000
*Bullion Beck	" 20	100,000	120,000	2,067,000
Calumet & Hecla	" 10	1,500,000	1,500,000	48,350,000
Carlton	Mar. 4	16,000	16,000	140,965
*Centennial Eureka	" "	30,000	60,000	1,920,000
Charleston	" "	10,000	10,000	150,000
*Coronas	" "	" "	3,000	8,000
Daly	Mar. 1	37,500	37,500	2,925,000
*Della S.	" "	" "	10,000	60,000
*Elkton Con.	Feb. 20	20,000	45,000	211,960
*Florence	" 1	3,606	7,212	121,712
*Galena	" "	" "	5,000	71,000
Gold Con.	Feb.	20,000	15,000	150,000
*Hecla Con.	" 25	15,000	30,000	2,175,000
Highland	" 20	20,000	20,000	3,244,918
*Homestake	" 25	31,250	62,500	6,150,000
Hope	Mar. 1	10,000	20,000	672,252
Iowa Gold	Feb. 15	5,000	5,000	60,000
*Last Chance	" "	" "	20,000	40,000
*Le Roi	" "	" "	50,000	300,000
*Mercur	Feb. 20	25,000	50,000	625,000
*Mont. Ore Pur. Co.	" "	" "	40,000	520,000
*Morning Star	Feb.	9,600	24,000	474,000
*Napa Con.	" "	" "	10,000	80,000
*N. Y. & Honduras	Feb. 15	15,000	30,000	705,000
*Ontario	Mar. 1	15,000	30,000	13,325,000
Oscocla	Feb. 1	50,000	50,000	2,122,500
*Portland	" 15	30,000	60,000	923,000
Quincy	" 15	400,000	400,000	9,070,000
Reco.	" 15	100,000	100,000	137,500
*Sacramento	" 20	5,000	10,000	17,000
*Silver King	" 7	37,500	75,000	937,500
*South Swansea	" 20	7,500	15,000	22,460
*Swansea	" "	" "	5,000	26,500
Utah	Feb. 10	2,000	2,000	175,000
*Victor	" 15	20,000	40,000	745,000
Totals		\$3,093,956	\$3,680,212	\$109,506,288

* January dividend paid.

NOTE.—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. Readers of the *Engineering and Mining Journal* will confer a favor on the publishers if they will notify the *Journal* of any errors or omissions in the above table.

STOCK QUOTATIONS.

Table with columns: NAME OF COMPANY, Location, Par. val., Feb. 20, Feb. 21, Feb. 22, Feb. 23, Feb. 24, Feb. 25, Feb. 26, Sales. Lists various companies like Alamo, Anaconda, and others.

*Official quotations. Sales, Consolidated and New York Stock Exchanges, 11,550 shares; New York Mining Exchange, 14,500 shares; total, 26,050 shares. † Holiday.

INDUSTRIAL, COAL AND COAL RAILROAD.

Table with columns: NAME OF COMPANY, Par. value, Feb. 20, Feb. 21, Feb. 22, Feb. 23, Feb. 24, Feb. 25, Feb. 26, Sales. Lists companies like Balt. & Ohio, Ches. & Ohio, etc.

* Official quotations N. Y. Stock Exchange. † Holiday. Total shares sold, 73,631.

SAN FRANCISCO, CAL.

Table with columns: NAME OF COMPANY, Location, Par. value, Feb. 19, Feb. 20, Feb. 21, Feb. 22, Feb. 23, Feb. 24, Feb. 25. Lists companies like Alta, Belcher, etc.

* Official telegraphic quotations, San Francisco Stock Exchange. † Holiday.

BALTIMORE, MD.

Table with columns: NAME OF COMPANY, Location, Par. value, Bid, Ask, NAME OF COMPANY, Location, Par. value, Bid, Ask. Lists companies like Balt. M. & S., Conrad Hill, etc.

BOSTON, MASS.

Table with columns: NAME OF COMPANY, Location, Par. val., Feb. 19, Feb. 20, Feb. 21, Feb. 22, Feb. 23, Feb. 24, Feb. 25, Sales. Lists companies like Allouez, Anaconda, etc.

* Official quotations Boston Stock Exchange. † Holiday. ‡ Ex-dividend. Total sales, 34,890.

COLORADO SPRINGS, COLO.

Table with columns: NAME OF COMPANY, Par. value, Feb. 15, Feb. 16, Feb. 17, Feb. 18, Feb. 19, Feb. 20, Sales. Lists companies like Ajax, Alamo, Am'ric'n C, etc.

Official quotations. Total shares sold listed, 399,863; unlisted, 934,500.

CLEVELAND.

Table with columns: NAME OF COMPANY, Par. value, Feb. 23, Bid, Ask, NAME OF COMPANY, Par. value, Feb. 23, Bid, Ask. Lists companies like Aurora, Chandler, etc.

BRITISH COLUMBIA.

Table with columns: NAME, Selling price, NAME, Selling price, NAME, Selling price. Lists companies like Boundy Creek, Old Iron Sides, etc.

LONDON. Feb. 12. Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations. Lists various mining companies like Nth Americans, Alaska-Mexican, etc.

DENVER, COLO. Feb. 12. Table with columns: NAME OF COMPANY, Par value, Feb. 15, Feb. 16, Feb. 17, Feb. 18, Feb. 19, Feb. 20, Feb. 21, Sales. Lists companies like L'nd Mines, Ancon, etc.

PARIS. Week ending Feb. 12. Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Div. last year, Prices. Lists companies like Acieries de Creusot, etc.

DENVER, COLO. Feb. 12. Table with columns: NAME OF COMPANY, Par value, Feb. 15, Feb. 16, Feb. 17, Feb. 18, Feb. 19, Feb. 20, Feb. 21, Sales. Lists companies like L'nd Mines, Ancon, etc.

MEXICO. Week ending Feb. 11. Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Opening, Closing. Lists companies like Amistad y Concordia, etc.

SALT LAKE CITY, UTAH. Week ending Feb. 20. Table with columns: STOCKS, Par value, Bids, Asked, Actual selling price. Lists companies like Ajax, Alliance, etc.

VALPARAISO, CHILE. Jan. 2. Table with columns: NAME OF COMPANY, Capital, Share value, Last dividend, Prices. Lists companies like Arturo Prat, etc.

PHILADELPHIA, PA. Table with columns: NAME OF COMPANY, Location, Par value, Feb. 18, Feb. 19, Feb. 21, Feb. 21+, Feb. 23, Feb. 24, Sales. Lists companies like Cambria Iron, etc.

SHANGHAI, CHINA. Feb. 4. Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Price. Lists companies like Jelebu Mfg. & Trad., etc.

HELENA, MONT. Week ending Jan. 21. Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bids, Asked, Shares sold, Price. Lists companies like Am. Dev. & M. Co., etc.

PITTSBURG, PA. Week ending Feb. 22. Table with columns: NAME OF COMPANY, Location, Par value, Bids, Asked, Selling price. Lists companies like Mansfield, etc.

* Official quotations Colorado Mining Stock Exchange. Shares sold, listed, 497,40; unlisted, 355,700. Total, 853,100. * Official quotations Philadelphia Stock Exchange. † Holiday. Total sales, 22,144. * Official quotations Helena Montana Stock Exchange. † Holiday. Total shares sold, 5,600. * Official quotations Pittsburgh Stock Exchange.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last), and Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last).

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends and the Cons. Virginia \$42,390,000. § Dividends paid since consolidation. ¶ Bodie, Bulwer and Mono transferred to Standard Cons., January, 1887. 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.