

The Engineering and Mining Journal

WITH WHICH IS CONSOLIDATED "MINING AND METALLURGY."

VOL. LXXIII:

NEW YORK, SATURDAY, JANUARY 25, 1902.

No. 4.

THE ENGINEERING AND MINING JOURNAL.

(Incorporated.)

253 BROADWAY, NEW YORK.

TELEPHONE, 3095 "CORTLANDT." P. O. BOX, 1835.
CABLE ADDRESS, "MINGERING, N. Y."

W. J. JOHNSTON, President. F. J. PRATT, Treasurer.
LUCIUS S. BIGELOW, Vice-Prest., and Gen'l Mgr.

CHICAGO (Tel., 73 Harrison) . . . 737 Monadnock Building
DENVER 206 Boston Building
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SAN FRANCISCO Mills Building
VANCOUVER, B. C., Molsons Bank Building
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SUBSCRIPTIONS

Single Copies, 15 Cents.

United States, Canada, Mexico, yearly, 52 copies, In advance, \$5.00
Other countries in Postal Union, \$7.00
By Bank Draft, P. O. Order or Express on N. Y.
English Subscriptions Payable at London Office, £1 8s 9d

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THE RIGHT of a stockholder to inspect a mine of which he is part owner is recognized in New Zealand more fully than in this country, or indeed in any other mining country of which we are aware. The mining law of 1898 provides that any person owning a share or interest in any mine is entitled to enter and inspect that mine, with or without an attendant expert, on any working day between the hours of noon and 1 o'clock; and for any manager or director to obstruct such inspection is to commit an offense against the law, which is punishable by serious penalties. Even this is not considered sufficient, and a bill is now pending in the New Zealand Parliament to increase the time allowed and otherwise enlarge the stockholder's right to inspect his property.

OUR SUDBURY correspondent refers, in a letter printed elsewhere, to current reports in relation to a proposed combination of interests among nickel producers. These rumors have been in circulation for some time, but a special impetus has been given to them recently by the sale to Americans of the stock held by the London & Globe Company in the Nickel Corporation, Limited. We have already referred to the affairs of that company, which owns properties in New Caledonia, and its report has been published. With regard to the general question of a consolidation of interests, it may be said that such an agreement has been under discussion, but we are informed that no definite conclusions can yet be reported; and it is quite probable that none have yet been reached.

THE SHARP contrast between German and American methods is shown by a recent discussion in *Gluckauf* of the coal cars used on German railroads. The dumping car of large capacity is such an old story here that it seems hardly credible when we are told that the advantages of dumping cars have only been realized very recently in the Rhine-Westphalia District, the most important coal district in Germany. Their first use began by the construction of 300 cars by the Eisenbahnwagen-Bauanstalt Talbot, of Aachen. These cars have side discharge and will carry 15 tons of coal. A recent report says that the saving in cost of unloading is 90 pfennigs, or 21½ cents per car, as compared with the old style, each time a car is unloaded. Some larger cars, to carry 30 tons each, are now being put in use. The Prussian State Railways are even more backward, and only a short time ago the first order for dumping cars was given. This was only for an experimental lot of 40 cars, which are to carry 25 tons each on six wheels, and are to have side doors for dumping. The hopper-bottom car does not seem to be known in Germany.

THE PRINTED report of the official receiver of the London & Globe Finance Corporation has been published in London, and it supplements on some points the information given by him at the meeting of shareholders held a few weeks ago. No information has yet been published as to the exact state of the accounts, but no doubt this will follow later. One very important disclosure is that the dividend paid in 1898 was paid out of money lent by Mr. Whitaker Wright, as the profit shown on the balance sheet

was purely a paper one, and could not be realized in cash. It has been pointed out that the assets and profits of this group of companies were never given in the balance sheet in such a way that any intelligent idea could be formed as to their value, so that this disclosure is not at all a surprising one. It is already well known that another balance sheet of this corporation was doctored by the temporary transfer of a heavy liability to another company. Another piece of interesting information given by the official receiver is that the qualification shares of the directors of subsidiary companies were always presented to them by the London & Globe, so that, as the law does not hold such transfer as for value, the directors are now liable to have to pay the par value for them.

OUR CONTEMPORARY, *Stone*, in its January number, gives place to a warning against the apparent danger of an overproduction of cement in the United States. It is well known that the production, especially of portland cement, has been increasing at a very rapid rate, and even at the present time it is probably in excess of the demand, notwithstanding the great activity in building which has resulted from the prosperity of the past two or three years. The older established companies have undoubtedly built up a very large and prosperous trade, and the present danger is that the newer concerns will be driven to force their product upon the market at all sorts of prices in consequence of the necessity of obtaining cash returns, which many of them must have. This tendency to too rapid expansion is especially apparent, our contemporary thinks, in Michigan, where the number of new concerns started during the past year has been very considerable. In that State there is a probability that if all the new companies go into operation they will not only produce more than can be sold; but it is also possible that the plants operated will be much too large for the supply of cement material in the State. At present there is a tendency to seize upon every deposit of so-called marl; but not all the marl is suited for the manufacture of cement, and it is very probable that too little discrimination has been exercised in this respect. It seems to us that this warning is a timely one, and that persons who expect to engage in the manufacture of cement should investigate carefully not only the possibilities of the market, but also the supply of suitable material.

We have previously referred to the large exports of gold from Australia, and the fact that a considerable portion of those exports is now going to countries other than Great Britain, which formerly took the bulk of the Australian gold. The total exports to all destinations for the eleven months from January 1 to November 30 were reported by the *Australian Mining Standard* as follows:

	1900.	1901.	Changes.
Melbourne	£2,694,541	£3,023,951	I. £329,410
Sydney	4,535,562	3,460,824	D. 1,074,738
Adelaide	50,000		D. 50,000
Albany & Frem'tle.	3,625,966	4,633,936	I. 1,007,970

Total £10,906,069 £11,118,711 I. £212,642
During the past year considerably less than half of the gold shipped went to Great Britain, although most of it was shipped on British account. Of the outside shipments £2,150,000 went to San Francisco, this sum, however, being somewhat

smaller than the shipments in 1900. A total of £2,650,000 went to South Africa, and these exports were something altogether unprecedented. The gold was of course sent there to meet the demands required for the British army in preference to forwarding it from London; and these shipments will doubtless be dropped as soon as the immediate necessity for them is over. The sum of £1,771,961 was exported to India. This was sent mainly in the early part of the year when the Indian Government was trying to increase its gold reserve. The only other item of importance was £199,799 to China. This was considerably in excess of previous years, Australian remittances to China generally taking the form of silver rather than of gold. It is probable that a considerable part of the gold sent this year was to pay the expenses of the British contingent of the allied army at Peking.



THE CRITICAL state of the English company that owns the Welsbach incandescent gas light patents and manufactures the mantles and burners is causing considerable anxiety among shareholders. This company has never been a commercial success, for the capitalization is too high, and the business policy has not been sound. The absence of dividends caused the shareholders to appoint a committee of investigation some six months ago. This committee consisted of several eminent business men, and their recommendations for reorganization were on practical lines. But the directors are not disposed to reform or to resign. The policy hitherto has been to endeavor to keep a monopoly in the field by scaring away competitors and rivals by threats of legal proceedings and by the commencement of actions that are never completed. At the same time absurdly high prices have been charged, and comparatively inferior articles placed on sale. The original price paid for the patents and for the business was far too high, and has saddled the company with a capital away out of proportion to the possible profits. The shareholders' committee recommended that the capital should be written down, and that the energies of the management should be devoted to the production of first-class apparatus and mantles at a low price instead of the prosecution of rivals, especially as the patents have not very long to run.

There is no doubt that the Welsbach system has not been adopted so widely in England as it might have been. Almost every town and village has excellent gas supplies, and for this reason the Welsbach light would be a very powerful rival to the electric light. Owing, however, to the poor quality of the mantles and the burners, the Welsbach light is rapidly losing in the race. Another point that requires the attention of shareholders in the company is that the supply of rare earths is somewhat uncertain, and that the material cannot be recovered and used over again.



SILVER SHIPMENTS TO THE EAST.

We have now the complete figures for the exports of silver to the East for the year 1901, both by London and by San Francisco. The values given in the returns are shown in the table below, those reported by the British Board of Trade being reduced to United States currency. The last line of the table gives the approximate quantity of silver covered by these values at the average prices of the year:

	1900.	1901.	Changes.
British East Indies:			
London	\$35,603,356	\$37,700,562	I. \$2,097,206
San Francisco ..	.....	30,000	I. 30,000
Totals.....	\$35,603,356	\$37,730,562	I. \$2,127,206

Japan:			
London	\$437,027	\$97,333	D. \$339,649
San Francisco ..	79,393	2,280	D. 77,113
Totals.....	\$516,420	\$99,613	D. \$416,807
China:			
London	\$12,993,435	\$6,188,677	D. \$6,804,758
San Francisco ..	14,661,385	11,086,479	D. 3,574,906
Totals.....	\$27,654,820	\$17,275,156	D. \$10,379,664
Total	\$63,774,596	\$55,105,331	D. \$8,669,265
App. ounces.....	103,986,000	93,478,000	D. 10,508,000

The December exports to India were light and those to China showed an increase as compared with the earlier months of the year, so that some change is shown as compared with the figures up to November. It will be seen from the table that the general result was an increase of about 6 per cent in the shipments to the British East Indies, which includes the Straits as well as India proper. To China there was a decrease of 37.5 per cent. the result of the disorganization of Chinese trade during the greater part of the year. The total shipments show a decrease in values of 13.6 per cent, part of which was due to the lower average prices of silver during the year, the falling off in the actual shipments of metal being 10.1 per cent only. The shipments to Japan are hardly worthy of note, that country having ceased to be a factor of any importance in the silver market. Notwithstanding the decrease in 1901, the East still continues to be the largest purchaser of silver, the fact that nearly 93,500,000 ounces of the metal were sent from this country and Europe during the year showing its great importance. It must be remembered, also, that this statement does not include the silver sent from Australia direct to China and India, the statements for which have not yet been received; nor does it include the silver which was sent to China through the Russian and German banks. The Russian expenditures in Northern China must have been considerable during the year, though the German exports were probably very much smaller than in 1900.

THE BRITISH ROYAL COMMISSION ON COAL.

The personnel of the Royal Commission appointed to investigate and report upon the present condition of Great Britain's coal trade meets with general approval among those interested in the coal mining industry of that country. It consists of five coal mine owners, two railway directors, two coal exporters, two miners' agents, three professors and two geological survey directors. The Right Hon. W. L. Jackson, chairman of the Great Northern Railway, is president of the commission, and the other members are: Sir George J. Armytage, chairman of the Lancashire & Yorkshire Railway Company; Sir William Thomas Lewis, general manager of Lord Bute's property in South Wales; Sir Lindsay Wood, chairman of the Durham Coal Trade Association; Mr. Thomas Bell, of Messrs. Pyman, Bell & Co., Newcastle, coal exporters; Mr. William Brace, miners' agent, South Wales; Mr. Arthur Curren Briggs, chairman of Messrs. Henry Briggs, Son & Co.; Mr. Harold Bailly Dixon, professor of chemistry at Owens College; Mr. James Stedman Dixon, mining engineer, president of the Mining Institution of Great Britain; Professor Clement Le Neve Foster, of South Kensington; Mr. Edward Hull, lately director of the Geological Survey of Ireland; Professor Charles Lapworth, Birmingham University; Mr. Joseph Paton Maclay, of Messrs. Maclay & McIntyre, shipbrokers, Glasgow; Mr. Arthur Sopwith, manager of the Cannock Chase Colliery Company; Mr. J. J. Harris Teall, director of the Geological Survey of the United Kingdom, and Mr. Ralph Young, secretary to the Northumberland Miners' Mutual Provident Association.

The work of the commission will cover a wide field and embrace a variety of conditions bearing upon the industry. It is to inquire into the extent and available resources of the coal fields of the United Kingdom; the rate of exhaustion which may be anticipated, having regard to possible economies in use by the substitution of other fuel or the adoption of other kinds of power; the effect of exports of coal on the home supply and the time for which that supply, especially of the more valuable kinds of coal, will probably be available to British consumers, including the Royal Navy, at a cost which would not be detrimental to the general welfare; the possibility of a reduction in that cost by cheaper transport or by the avoidance of unnecessary waste in working through the adoption of better methods and improved appliances, or through a change in the customary term and provisions of mineral leases; and whether the mining industry of Great Britain under existing conditions is maintaining its competitive power with the coal fields of other countries.

The *Colliery Guardian* calls attention to the fact that these inquiries involve questions which should call for the advice and services of the engineer, the physicist, and the economist, which it says lack representation on the commission. It may be found necessary to add two or three more names to those given above. The engineering profession is well represented by Dr. Foster, who is a mining engineer and one of H. M. Inspectors of Mines, but one or two men well versed in the sciences of physics and economics would probably add strength to the commission.



MARKET CONDITIONS.

There is little change to report in the iron market, business remaining very active in almost all directions. Railroad conditions are slowly improving, the movement of fuel and ore to furnaces being better, while deliveries of finished material are somewhat more promptly made. There is no sign yet of any break in the market, and preparations for future business are on a very large scale. There is no new point of special interest this week, though meetings of representatives of the bar mills and of some other producers have been held.

In copper we do not seem to have reached a solid basis yet. More buying is reported, and there is a much better demand for export than has been reported for some time past. Manufacturers generally are using a great deal of copper, and even the actual pressing requirements ought to make up a fair business. Notwithstanding this, there is still apparent an impression that prices will go lower yet, and consumers naturally hesitate to purchase large stocks. How long this condition of affairs will last it is difficult to say; opinions differ widely, even among people who ought to be well informed. On one point, however, there is practically only one opinion, and that is that the present need is not lower prices, but some assurance of stability in quotations. From this point of view it is safe to say that the recent drop in prices has hindered rather than promoted the sale of copper. The present increase in home demand is due to the fact that manufacturers' stocks are generally low, and some buying is absolutely necessary.

In other metals there have been no material changes. Business in lead is steady and in spelter good. Zinc ore in the Joplin market continues in good demand, with prices firm, and some advance for the best grades. Tin is in good demand for consumption.

Silver shows a somewhat better demand, but the change is only slight. The better condition of af-

fairs which is gradually being brought about in China promises a firmer market, but it will probably take some time to reach this result.

The Western coal market still remains largely a matter of car supply. The meeting of the miners at Indianapolis is still in progress, but no results are reported. In fact no definite results will be reached until the joint meeting or conference is held.

The anthracite coal trade continues active, with demand strong in practically all territories while the supply is barely sufficient. As a result prices continue very firm and the large producers are storing no coal. In the Northwest there is the usual winter market with supplies on dock sufficient for all demands. In Chicago territory trade shows little change, consumption continues steady, and the supply of all-rail coal is still light. Along the lower lakes and in Canadian territory car supply is not yet what it might be and coal is in rather short supply, particularly chestnut size. In the East all-rail trade continues active. The demand at seaboard points is seasonably good. The outlook remains excellent.

In the seaboard bituminous trade slightly better transportation facilities given by the main line roads, and the usual slackening of demand at this season of the year are working together and the situation should steadily if slowly improve. Coastwise freight rates are a little easier, but vessels are still subject to long delays in loading at the lower ports. The situation along Long Island Sound has improved and the distress for coal there is less acute. There is a good demand from points beyond Cape Cod and consumers in the all-rail trade are still unable to get the full amounts they order.



THE CENTRAL MINING INSTITUTE, GERMANY.

The Central Mining Institute—Centrale für Bergwesen—is the development of an idea which has been under discussion in Germany for some time. Generally speaking, its main object is to establish and gradually develop a central bureau for the purpose of affording information in relation to mining conditions and mining propositions in all parts of the world. The Institute is establishing relations with prominent mining engineers in different countries who will be connected with it as members of an advisory board or as technical advisers to assist the management. One of the main objects of the new Institute is to procure reliable expert opinion on mines and prospects in all parts of the world, and these opinions and reports will naturally have to be obtained from the residents of different countries with whom the Institute either has, or may hereafter, establish business relations. In this way, it is believed that investors in mining property will not only be protected, but the fact that reliable information can readily be obtained will promote and increase investments in mining ventures. It is intended to have the institution thoroughly independent, having from the outset able support and so organized as to be in touch with the technical and economic conditions governing the mining world, and the special branches of science connected with it. Due allowance will be made for the extent to which specialization has extended among mining engineers.

As a necessary assistance in the work of such an organization the Central Bureau will undertake the establishment and maintenance of systematized records, including descriptive registers of mines in all parts of the world, a library, including official returns and scientific reports, annual reports of mining companies, and all publications relating to mining law, mine administration, mine engineering and geology, with maps, statistics, and other information useful for reference.

The Institute commenced its preliminary work

January 1, 1902, but it will, of course, take some time to develop its work. The business management has been intrusted to Mr. Eichmeyer, formerly chief inspector of mines at Clausthal, and to Dr. Nauman, hitherto manager of the Mining and Geological Department of the Metallurgische Gesellschaft. The services of Prof. Lengemann, Geheimer Bergrath, Aix La Chapelle, have been secured as technical and scientific adviser. The Royal Geological Landes-Anstalt, of Prussia, has taken an interest in the endeavors of the Institute and has declared its readiness to promote the advantages of same by giving advice whenever desired. Professor Dr. Beyschlag, Geheimer Bergrath, Berlin, has promised the Institute the benefit of his advice and assistance.

It is further intended to secure the co-operation of prominent gentlemen from abroad as technical advisers to assist the management, or as members of the advisory board, or in both capacities. For the one or the other of these offices, gentlemen who have held positions or possess qualifications as below, would receive consideration: (1) Gentlemen who are or have been at the head of important mining concerns. (2) Lecturers on mining and geology at universities, academies and technical schools; (3) members of Government geological surveys. The Metallurgische Gesellschaft has abolished its department of mining and geology in favor of the Institute, to which the complete records and library of that department have been transferred.

The central office will be at Frankfort-on-the-Main, Germany. The list given below of firms and corporations interested in the organization of the Institute will show the high business character which it is proposed to maintain: Allgemeine Deutsche Creditanstalt, Leipsic; Allgemeine Elektrizitaetsgesellschaft, Berlin; Bergisch-Maerkische Bank, Elberfeld; Berliner Handelsgesellschaft, Berlin; Gebrueder Bethmann, Frankfort; Deutsche Gold und Silber Scheide Anstalt, formerly Roessler, Frankfort; Direction der Disconto-Gesellschaft, Berlin; Duisburger Kupferhuetten, Duisburg; Elektrizitaets-Actiengesellschaft, formerly Schuckert & Co., Nuernberg; von Erlange Sohne, Frankfort; Ertel, Bieber & Co., Hamburg; Farbwerke, formerly Meister, Lucius Bruening, Hoechst; Frankfurter Filiale der Bank fuer Handel and Industrie, Frankfort; Wilhelm Merton, Frankfort; Metallurgische Gesellschaft, A. G., Frankfort; A. Schaaffenscher Bankverein, Berlin and Cologne; Lazard Speyer-Ellissen, Frankfort; Jacob S. H. Stern, Frankfort.

No scale of charges for the services of the Institute has yet been prepared, although provisional arrangements have been made as to the payment of fees, etc. A permanent scale will be established as soon as experience has shown better what is required. It must be understood that it is not intended to operate the bureau for the purpose of securing large profits, and the scale will be made on a basis which will simply provide for the necessary expenses and a moderate reserve fund. The articles of association provide that in any event the dividends shall be strictly limited to 5 per cent yearly. As already noted, negotiations are now in progress to secure the services of mining engineers and others of standing in different countries.



A RUMORED NICKEL TRUST.

By OUR SPECIAL CORRESPONDENT.

For the past month or more various reports have been flying around the Sudbury District to the effect that a nickel trust has been formed by the United States Steel Corporation and the American refiners of nickel, in alliance with the French companies owning the New Caledonia mines. But any definite information about the matter is hard to get, except that as a preliminary step all the mines and works of the Canadian Copper Company are said to have been transferred to the Orford Copper Company,

and this latter company has also purchased a large water power on the Spanish River, some 20 miles to the north of the site for the proposed new smelting and refining plant of the Trust near Massey station. It is said that a radical change will be made in the working of the mines and the treatment of the ores, but as far as the making of matte is concerned, it is rather doubtful if any one can improve on the simple process worked out by James MacArthur, who has so successfully managed all the operations of the Canadian Copper Company for a long time.

In order to control all the nickel ore supplies some interests in the Sudbury District must first be bought up. Leaving out the Mond Nickel Company and its two mines, and also the Lake Superior Power Company and its two mines, there are still left even on the main range over a dozen good workable deposits of nickel ore belonging to other companies or in the hands of private owners. Then whatever may be done with the properties of the Nickel-Copper Company, of Hamilton, on the north range, five or six of the best ore bodies on that belt and in the township of Levac to the west of it, are still for sale. These cover about one-half of the total estimated quantity of nickel ore in the whole district.

From the number of inquiries received by the owners of nickel properties lately, it would seem as if some of the large consumers of nickel in England, France and Germany are anxious to provide for obtaining an independent supply of nickel for their own use, and two or more new companies may buy mines and begin operations in the district for this purpose during the coming season. In any case, the nickel industry is evidently on the eve of a great change, and judging by the present outlook, there is likely to be a sharp demand before long for some, if not all, of the desirable properties outside of the trust deal.

THE UGANDA RAILROAD.—This railroad, by far the most important yet undertaken in Central Africa, is completed. The London *Engineer* says that the laying of the rails of the Uganda Railway has been completed, the rail having reached the shore of Lake Victoria Nyanza on Thursday, December 19. Track laying began on August 5, 1896, and thus within less than 5 years of its inception this great undertaking has been brought to a successful conclusion. The railway is altogether 572 miles long; but its mere length conveys no idea of the difficulties which had to be overcome in carrying the steel track up from the shores of the Indian Ocean to the great plateau of the Central African lakes, more than 3,000 feet above the level of the sea, over intervening ranges of twice that altitude and more. The road had frequently to be cut through dense forests or hewn out of the rock; bridges had to be built over streams subject to the sudden rise and fall of tropical rains; in the lowlands malarial fever of a virulent type had to be reckoned with; and the attacks to which working parties were often exposed in the jungle from wild beasts, disturbed for the first time in their hereditary lairs, added a new and serious danger, certainly unprecedented on such a scale, to the task of railway construction. The cost has been about \$24,000,000, or \$41,960 per mile.

COINAGE OF THE BRITISH MINT.—The British Mint report for the year 1901 shows that the number of pieces coined during the year was as follows:

	Imperial.	Colonial.	Totals.
Gold	3,616,612		3,616,612
Silver	18,843,423	45,430,000	64,273,423
Bronze	41,349,387	9,172,000	50,521,387
Totals	63,809,422	54,602,000	118,411,422

The face value of the gold coins was £2,599,000; of the silver coins, £914,201; of the bronze, £120,280; making a total of £3,633,481. There were gold coins of the face value of £1,800,000 and silver coins to the value of £243,075 withdrawn from circulation and recoined, as being too much worn, below weight and otherwise unfit for circulation.

THE UPLAND PLACERS OF LA CIENEGA, SONORA, MEXICO.

By ROBERT T. HILL.

In May, 1901, the writer was requested to examine certain auriferous deposits in the vicinity of Cienega, District of Altar, State of Sonora, which in some respects may be described as a diminutive American Kalgoorlie. The point was reached by an overland journey of some 60 miles from the city of Magdalena, on the Sonora Railway. Inasmuch

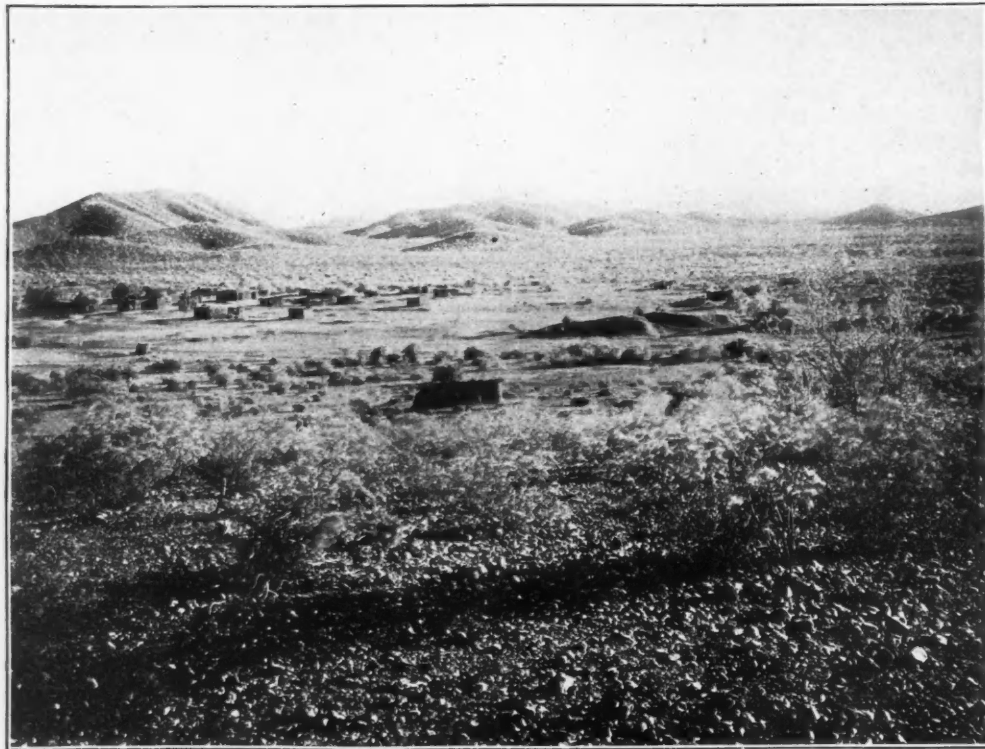
is a flowing stream, soon ceases to carry water upon the surface of its stream bed west of the railway, but it continues as a topographic feature marked by a wide valley of loam and gravel covered by dense thickets of the species of mesquite-like tree called "catsclaw." This tree seems to inhabit sub-irrigated soils, and there is little doubt that much of the water of the Magdalena River continues its course toward the Pacific beneath the surface in the sand of its stream bed, for I found in the stream

their low second bottoms the country is mostly desert adobe soil, inhabited by a few species of cactus and occasionally a struggling growth of mesquite; but throughout the whole area I failed to observe a single sprig of grass.

About 40 miles west of Magdalena is a peculiar terrace hill known as La Trinchera. The terrace upon this hill, which from a distance looked like lines of stratification, were really the works of man, and Mr. W J McGee, of the Bureau of Ethnology, informs me that it is one of the most interesting prehistoric monuments of this portion of Mexico.

At the foot of this mountain there is a small village of primitive people by courtesy called Mexicans, but who in their habits and racial features are the aboriginal Papagos and Yaquis of this part of Sonora. It was here that I saw the first evidence of gold mining, and this as well as all the other industries of the village was of the most primitive character. From the adjacent hills the quartz ore was brought in sacks on burros. This was placed upon a flat stone and pulverized with large round boulders by small boys, this being apparently the first progenitor of the modern stamp mill. The pulverized material was then placed in a primitive arrastra, ground for thirty days by a perambulating burro and amalgamated.

This industry, so the urbane proprietor informed me, had been carried on by himself and ancestors for many generations, and from the ruins of the arrastras in the neighborhood and local tradition there is little doubt that gold has been mined here in a primitive fashion since the first invasion of Sonora by the Spaniards in 1530, and probably prior to that time by the people who previously inhabited it. From this place onward we found the country inhabited entirely by the peasant class, whose only means of livelihood was to proceed to the hills when in need and procure a little gold with which to purchase the commodities of life. About 60 miles from Magdalena and about 30 miles from Cienega, we en-



CIENEGA HILLS AND PLACER GROUNDS, MEXICO.

as this is one of the oldest gold districts in America, from which the metal has been taken for nearly 300 years, a brief description of it may be of interest.

Northwestern Sonora is a dreary desert country. A few rivers like the Magdalena, Sonora and Yaqui drain the western slopes of the Sierra Madre and attain considerable volume in their upper waters, but they gradually decrease in copiousness until most of them sink into the desert wastes before reaching the Pacific except in times of extreme flood.

Immediately west of the main scarp of the Western Sierra Madre, there is a rough broken country com-



PRIMITIVE QUARTZ MILLING.

posed largely of distorted rocks of Paleozoic and Mesozoic age capped by vast sheets of dissected cantera, as the volcanic tuff is appropriately named, which constitutes such a conspicuous feature in Trans-Pecos, Texas, and in Chihuahua and Sonora, Mexico.

To the west of the Sonora Railway, however, the cantera apparently ceases and the country is one of wide mesquite deserts broken here and there by low hills, showing signs of great topographic antiquity. The Magdalena River, which at Magdalena

valley, some 20 miles below where the permanent water ceased, an extensive irrigated wheat ranch owned by Señor Cerno, one of the brothers who are the feudal land owners of the surrounding country. At this farm wells were sunk in the second bottom of the streamway to a depth of 10 to 15 feet, which pumped a tremendous volume of water sufficient to irrigate about 2,000 acres of wheat land. The bearing of this underground water upon the subject of the gold deposits will be presently apparent. A few feet above the wide indented streamways and

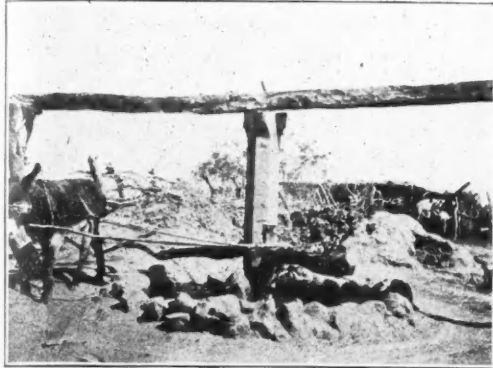
countered the first of the rich placers, which it is the object of this paper to describe.

El Tiro is situated in the saddle of a low, beaded row of hills and consists of a village of three primitive Mexican stores and a 20-stamp quartz mill. The hills at this place rise about 500 feet above the adjacent desert towards which they gently slope. They consist of metamorphosed slates cut by numerous quartz and dioritic veins highly tilted, and occasional Paleozoic limestones. Disintegration seems to attack the surface of these summits very uni-



DRY WASHER PITS, CIENEGA.

formly, resulting in finely shattered and almost pulverized material, having the nature of a very light sandy loam. Rainfall does not seem to be sufficient to remove this waste to any great distance at a single time. As a result the slopes of the hills are covered with this material, which in a previous technical paper I have termed "the wash," from very near their summits to the plain. Upon approaching these hills I saw several parties of Mexicans doing dry washing with primitive machines of the wheat fan type, and upon examining their results was astonished at the apparent richness of the ground. As these ma-



AN ARRASTRA.

chines can only use the dry surface dirt, and the material has to be sifted before running through them, the whole face of the country was covered by small shallow pits and slight mounds, representing the work of the dry washers for many years. In the village of El Tiro the medium of exchange consists entirely of gold dust, and every merchant keeps scales, and beneath his counter various crockery utensils full of nuggets. By inspecting the stocks on hand I was enabled not only to obtain a good study of the size, nature and character of the gold, but to purchase an excellent collection of specimens. An interesting fact about this gold was that it mostly consisted of large free and sharp grains, varying from a pin head to a hen's egg in

the ruins of an ancient Spanish mission church, and a few straggling date palm trees. The inhabitants are nearly all Mexicanized Papagos and Yaquis, and here, as at El Tiro, the sole source of revenue is the gold "dry washes" from the adjacent hills. The whole country for miles around Cienega is pitted with the dry washer diggings, and even in the town itself the principal streets, the cemetery and the walls of the old church are undermined by them.

How long gold has been obtained at Cienega in this manner is unknown, but tradition makes it the oldest gold-mining district of Mexico. Its gold was famous in the early annals before the discovery in California, and old Californians acknowledge their indebtedness to the Sonoran Cienegans for the rocker, pan and other methods first introduced into that country. To the south of Cienega are many low pointed hills, and there is an area of probably 20 square miles which has been worked over and over again by the methods described at El Tiro.

The free gold, both at El Tiro and Cienega, is clearly derived from the summit portions of the near-by hills, and the supply is in part renewed after each rainfall, when the natives turn out en masse to clean up the gold collected upon the edges of the vertical outcrops of the thin slaty strata in the little rills and road ruts. Apparently the gold is in many small leads, although several quartz leads of sufficient size have been encountered in the district to justify stamp milling.

The placer gold is found in all the debris of the slopes. This consists of a loamy sand with very little clay and occasional thick bands of caliche or lime cement. The dry washing is altogether superficial. In a few places pits have been sunk 10 or 15

of applying water to the recovery of this gold, and herein came the application of an interesting study of the question of underground water. So far as I am aware, I was the first to advocate some dozen years ago the principle that in the desert region of arid America the underground conditions are such that they are favorable for the collection of water



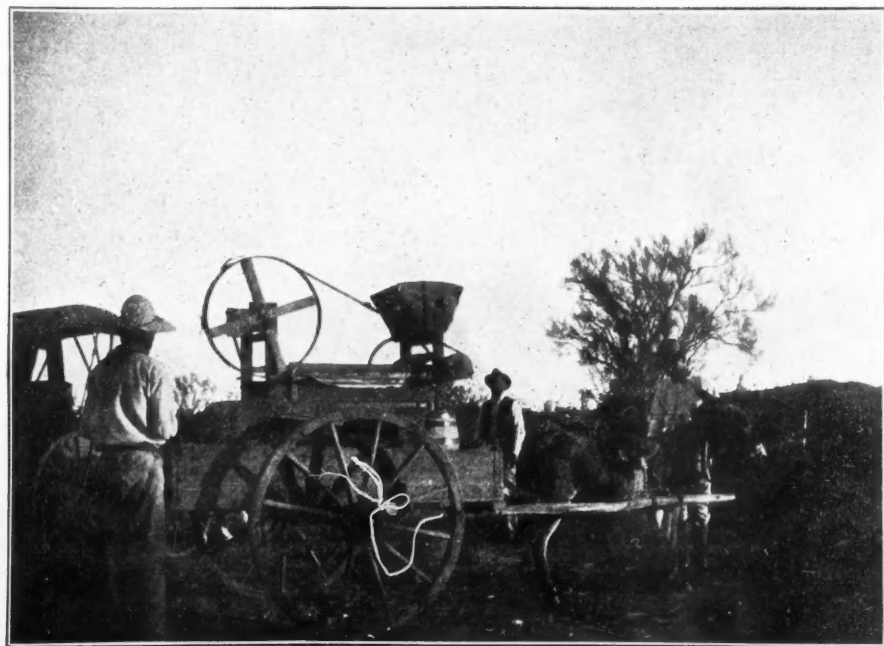
SPOONING FINAL DRY CLEAN-UP.



PUMPING UNDERGROUND WATER FOR IRRIGATION.

size. Wire gold was very common, and it all attested the fact that it was derived from near-by sources in the hills.

From El Tiro to Cienega, 30 miles, the road crosses two wide deserts separated by one low chain of hills about 9 miles north of Cienega. The village of Cienega is one of the most primitive places that I have ever visited, consisting of a few adobe houses,



DRY WASHING MACHINE MOUNTED ON CART.

feet into the caliche, which usually runs very high in gold.

The object of my visit to Cienega was to make a preliminary report upon the gold dirt and to ascertain if there was any feasible method of recovering it. I made many dry wash samples, which averaged over \$1 a yard, and being satisfied that the dry-washing process did not save over 30 per cent of the gold, I concluded that selected ground would at least average \$3 to the cubic yard. Since my visit thorough samplings of the ground have been made, and these show an average of \$1.84 to the cubic yard, with large tracts running over \$3. Inasmuch as the samples collected were mostly superficial and largely taken from the dry soil at the immediate surface, the great richness of the ground is unquestionable.

The fact of the gold being apparent, the important problem was to ascertain if there was any manner

in the loose detritus filling the desert valleys rather than in the impervious mountain rocks which outcrop around the rims of the deserts and lie beneath them as a floor. In the vicinity of Cienega there are three large desert basins, and each of these indicates a supply of underground water which if properly conserved and applied is capable of saving much of the gold of the rich placer deposits. The smallest of these deserts, only a few miles in extent, is that in which the village of Sonora itself is situated, and here the most apparent evidence of a considerable store of underground water was manifested by the Cienega itself, from which the village takes its name. This is nothing more or less than a point in the lowest part of the basin where the ground water comes out at the surface. Numerous wells in the village strike this water at a depth of about 8 feet. That the water is in considerable quantities is also evinced by the fact that a small

stamp mill has been run for many years in the village. A low chain of hills separates Cienega from a still larger basin, some 10 miles in cross-section to the northward, and an arroyo leads into this larger basin through the chain of Cienega hills from a still larger basin to the southeast. In the second bottom of this arroyo there are two wells. One of these was in constant use to run a small stamp mill to which ore is brought from the mountains some 10 miles distant. The other, now abandoned, was constructed for the Mina Colorado, 9 miles north of the well, and some 300 feet higher in altitude. A supply of water was pumped from this mill to the mine for three years through a 3-in. pipe sufficient to run a 20-stamp mill and a cyanide plant. It has since been abandoned owing to the working out of the mine.

Upon my recommendation this well was deepened toward bed rock. It has now been sunk from 15 feet, where the water was first encountered, to 57 feet, and two large pumps upon the property cannot exhaust it. It is estimated that this yields about 326 gallons per minute, and the water flows in with increasing quantity with each foot gained in depth. With this water the company now has an abundant supply to fill ponds for working the ground by the dredge process or even for fluming on a small scale, and the probabilities are that the water supply can be largely increased by other wells judiciously located.

THE DEVELOPMENT OF THE INDIANA COUNTY, PA., COAL FIELDS.

By WILLIAM GILBERT IRWIN.

The total production of coal in Indiana County for 1900 was 924,782 tons, of which something like 90,000 tons were used in the production of coke and the remainder of the production went to the general bituminous coal trade. For nearly twenty years the coke industry has been carried on in Indiana County, but it has only been within the past year or so that the rich fields of this county entered rightly upon their development. The figures of 1900 do not reflect the recent development of the coal industry in the county, nor does the gain for that year over 1899 give an adequate idea of the improvements now being made in the county. Most of the new mining properties have not yet been sufficiently developed to give an idea of what their production will be.

The physical position of Indiana County is such that its coal fields are divided into several geological divisions. The Upper Coal Measures, however, in most parts of the county are identical with the well-known Pittsburg bituminous vein. In the eastern part of the county along the Indiana branch of the Pennsylvania Railroad the leading coal vein is really an extension of the Connellsville coking seam, and some ten or fifteen years ago the coking industry was instituted in this part of the county on an extensive scale by J. W. Moore, the well known coke operator who had sold his Westmoreland County coking properties to the H. C. Frick Coke Company. The coking business, however, was never a great success, and with the death of Mr. Moore the coking industry in the county suffered a decline from which it has never entirely recovered.

The Moore coking properties were established at Homer City and Blacklick, and a number of similar establishments along the Indiana branch are still operating, the coal being washed before it is charged into the ovens. This adds considerably to the cost of producing coke and when there is a slack season in the coke trade the ovens usually close down. As the trade is now, however, the plants can be operated with a considerable profit, and the product, while not up to the standard of the Connellsville coke, proves a good furnace fuel. The coking operations have been confined to the valley of Blacklick Creek, a stream of considerable importance in the eastern part of the county. A number of mines for the shipment of raw coal have also been opened in this part of the county. When the present activities in the coal in-

dustry began, the first development in the county was experienced in this field. In it are included the townships of Blacklick, Center and White. The McCreary Coal and Coke Company had been operating in Center Township for some time and this company took steps toward extending its coal territory. The company has purchased about 3,000 acres of land. A number of other companies operating in this part of the county also bought up additional coal land, and Eastern capitalists have during the past year secured nearly 50,000 acres in this section.

The completion of the Buffalo, Rochester & Pittsburg Railroad through the county marked a new era in the industrial development of the field. The Rochester and Pittsburg Coal and Iron Company, the fuel branch of the road, immediately began buying up coal lands in the county. At first the coal purchases of this company were confined to the northern part of the county, along the line of the road, and the purchases extended into Armstrong, Jefferson and adjoining counties. Some months ago the company began acquiring coal lands in White, Center and Blacklick townships, and up to date the land secured by the company in the county aggregates about 25,000 acres, valued at something like \$1,500,000, exclusive of the improvements already completed or now in progress. The Buffalo, Rochester & Pittsburg Railroad has already surveyed a number of coal lands in the county, and a large amount of money will be spent in opening up and equipping mines.

For some years a number of small coal companies have been operating along the Conemaugh and Kiskiminetas rivers, which bound the county on the south. Blairsville is now an important coal mining center and there are a number of mines along the West Penn division of the Pennsylvania Railroad. Transactions in coal lands in this part of the county have been active during the past year. In the east central part of the county in Pine Township a deal involving 35,000 acres and \$3,000,000 capital was consummated during the past few months, the Philadelphia firm of J. H. Weaver & Co. being the purchasers. The plans for the development of this property involve the construction of twelve big shaft mines and the erection of three mining towns. Another big coal tract is being developed for the manufacture of coke by the by-product coking process.

The business of leasing coal lands is still a leading one and there are still many thousand acres of land in the county under option and awaiting purchasers. The Pennsylvania Railroad is arranging for important extensions in the county, and with the railway development now being made by the Buffalo, Rochester and Pittsburg road, which is pushing coal lines from the northern part of the county, the region will have ample shipping facilities. The Pennsylvania may also extend its coal roads from Cambria and Jefferson counties so as to tap the new fields in Indiana County. The new mines now being opened or planned will have the most modern equipment. This means electric haulage and tippel operation, electric mining machines and electric lighting; steel tipples, automatic trackage, and, in fact, all the modern appliances which enter into the most approved methods of bituminous coal mining, as practiced in the Western Pennsylvania fields. Everything will be done to increase the producing capacity of a mine, and nothing which tends to reduce coal mining to the most economic and scientific principles will be neglected.

GERMAN COAL PRODUCTION.—The reports published in the *Deutsche Kohlen-Zeitung* give the production of Germany for the 11 months ending November 30, 1901, at 98,946,805 metric tons of coal and 40,597,201 tons of brown coal (lignite); a total of 139,544,006 tons. The coke made in the 11 months was 8,434,946 tons. There were 8,451,427 tons of briquettes made, chiefly from brown coal.

GILPIN COUNTY, COLO., MINES IN 1901.

By OUR SPECIAL CORRESPONDENT.

The year 1901 was one of the most successful years in the 42 years of history of mining in this county. Gold was first discovered in paying quantities in the winter of '58-'59, and since then operations have gone on. From 1859 to 1872 the output of the county in gold was \$25,000,000 and since that year it has never gone below the \$2,000,000 mark, ranging from that amount to \$4,000,000 yearly. The total gold product to date is about \$105,000,000, which is only equalled by one other Colorado camp, Cripple Creek. Considering that most of the ore is low grade, the production is all the more worthy of mention. A large amount of the output has been mined by local enterprise. Outside capital is becoming interested largely as a result of this excellent record. The inducements to outsiders are the permanency of veins, the even values of the ores, the cheap cost of mining, transportation and subsequent treatment, the freedom of the county from labor troubles, and reasonable prices of mining properties.

For 1901 the production will approximate \$5,050,000, a very fair increase over the preceding year. The shipments of smelting and crude ore, concentrates, and tailings from the Black Hawk depot, total 69,705 tons, as compared with 59,683 tons the previous year, a gain of 10,017 tons or about 16 per cent. Added to the above about 12,500 tons of ores went to Idaho Springs, and the total tonnage is 82,205 tons. The milling ores of the county during the past year maintained their usual values, but the smelting ores have carried higher values, as shown by the statements of the sampling works.

Indications point to a better year in 1902. A large amount of heavy machinery has been installed on the larger properties. A number of properties operated only on a small scale by local parties will be worked much more heavily. Some big mines have been sinking several months, and a large amount of development has been done on other properties.

The sales of mining property in 1901 amount to nearly \$750,000, the principal sales being: Randolph Mill, \$23,500 and Golden Eagle group \$57,000 to English and Dutch parties; Boodle, \$40,000 to an English syndicate; National tunnel properties, \$75,000 to Chicago men; Perigo, \$100,000 to Colorado men; Robert Emmet, \$50,000 to Eastern men; Barnes, \$45,000 to Milwaukee men; Golden Wedge, \$70,000 to Eastern men; East Notaway lease, \$24,000 to Easterners; Arizona, \$20,000 to Boston men; East Whiting, \$20,000 to Colorado men.

An average of 550 stamps have been dropping at the mills during the year, of which 390 are slow-drop pattern and 160 rapid-drop. These stamps crush on an average 750 tons every 24 hours, and with the shipments of smelting and crude ores to outside points the daily product of the county is fully 1,000 tons. A new rapid drop 30-stamp mill was erected in Nevada Gulch by Philadelphia men. A slow drop 25-stamp mill is being erected to treat the Bonanza ores in Chase Gulch, and another stamp mill will be erected by New England parties on the Stewart property in Hawkeye District. It is almost certain that the Gregory-Buell Consolidated Mining and Milling Company will erect a mill near Central City. There is talk of a large concentrator being built at Black Hawk, and from the heavy tonnage going to the excellent concentrating mills at Idaho Springs there seems to be a splendid field for a modern mill of that type.

Gilpin County has been brought to the attention of the Eastern public lately by the many tunnel enterprises started to cut numerous veins at greater depths. All of these started in Clear Creek County. The principal are the Newhouse, the Central tunnel of the Big Five Company, the Knickerbocker, Philadelphia, and Lucania. These tunnels will relieve the mines of their water, a big item, will produce other results in deeper developments and naturally increase the working forces. Their influence has been felt by the numerous sales of properties.

English and Dutch parties, besides buying mine

and mill property worth \$80,000, have put up heavy machinery on the Carr, have built an aerial tramway, 6,100 feet from the mine to the mill, and have carried on heavy developments.

The Town Topics Mining Company is employing about 40 men on the leasing system, has paid three quarterly dividends of \$5,000 each, and is opening up a big mine. The Boston & Denver Consolidated Mining and Milling Company has an average working force of 75 men and the monthly shipments are about 2,500 tons, of which 10 per cent is smelting ore. The company is credited with dividends of \$75,000 for the year. The Cashier Mine, recently bought by Buffalo parties for \$70,000, is shipping heavily, the first-class ores going \$200 and the second-class from \$75 to \$100 per ton. The payroll shows 40 men at work. The Perigo mines, worked under lease for several years, have been daily shippers of 75 to 90 tons of milling ores. They will be worked by the owners, Messrs. Potter & Lightbourne, this year. About 60 men have been employed.

The Old Town Mine, a prospect up to 1901, has produced ore to the amount of \$50,000. It has been equipped with a first-class plant, and will be a much heavier shipper in 1902. A steady dividend payer in Russell District is the Calumet, a regular producer of 40 tons per day, carrying good values. Pittsburg, Pa., parties are interested. The Running Lode is owned by the Gowers Mines Syndicate, Limited, an English company. It has made as big a record as any in the county, and has paid good returns. It is reported that the shares have gone from 5 shillings to 15. The ores are of higher value than the average. Canadian parties are interested in the Ontario-Colorado Mining Company, and have kept up developments on a large scale. The shaft will be sunk to 1,000 feet, and the property will be a shipper this year.

One of the largest mining consolidations ever made in this county was that effected by the Gregory-Buell Consolidated Gold Mining and Milling Company. The properties are situated midway between Central City and Black Hawk. When formerly operated under different management with several working shafts, the properties were large producers and paid handsomely to the operators. A splendid plant of machinery and surface buildings has been put up, showing that the company intends to work on a large scale. As soon as the water is all out heavy developments will be started, and the company intends to put in a Cornish pump.

The Gilpin Tramway Company has added to its mileage by making connections to newer shippers, and now has about 20 miles of tracks. Its rolling stock is busy all the time.

The Gunnell Gold Mining and Milling Company is employing nearly 150 men, a number of whom are working on tribute account. The daily shipments average nearly 100 tons of very fair grade ore.

SUBSTITUTING RUSSIAN FOR AMERICAN PETROLEUM.—Consul-General Guenther reports from Frankfort, that according to the *Frankfurter Intelligenz-Blatt* the railroad management at Cassel calls attention to the order that American petroleum is to be used only for office lamps and signal lanterns, and then only if Russian petroleum does not produce a sufficient light. The Minister of Public Works has of late repeatedly ordered that only Russian petroleum be used; stating that, as in fifteen railroad districts it has been employed with uniformly good results, it must be taken for granted that at offices from which complaints have been received, the lamps have not been kept in good condition.

NICKEL MINING IN SILESIA.—According to *Stahl und Eisen*, the Martha and Benns nickel mines in the district of Frankenstein, Silesia, are making steady progress. While in 1899 only 80 tons of nickel ore were mined, the production rose to nearly 4,000 tons in 1900, valued at about \$20,000. The smelter is installed at the Martha Mine, and has a daily capacity of 20 tons.

THE THUNDER MOUNTAIN MINING DISTRICT, IDAHO.

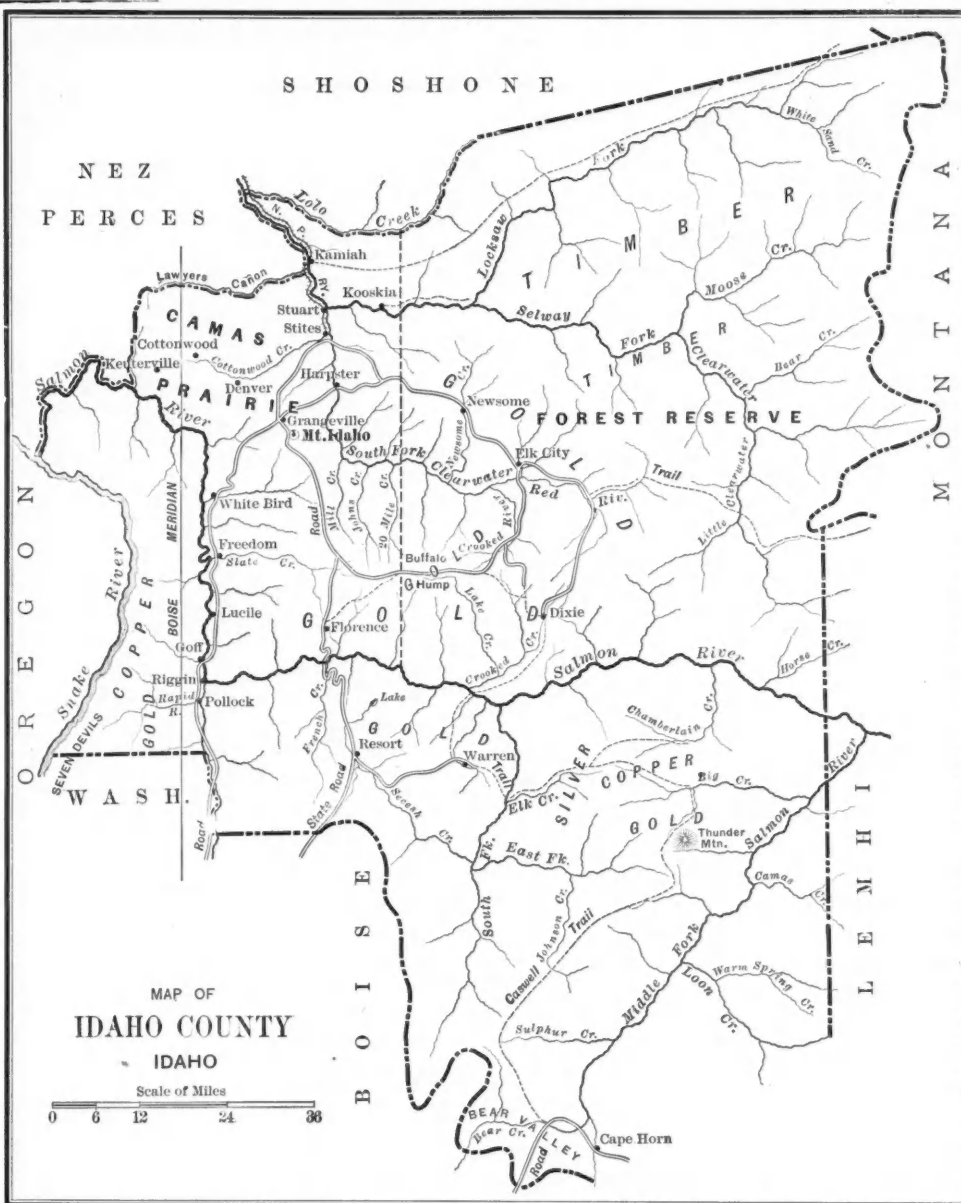
BY WALTER HOVEY HILL, C. E.

Much interest is being manifested in the Thunder Mountain country, and I would ask the space in the *JOURNAL* for a brief description of the location of this district and the different routes of travel necessary to reach the camp.

Thunder Mountain mining district is in Idaho County, Idaho. It lies in longitude 115° 10' west, latitude 45° 15' north. It is in unsurveyed public domain, and within the jurisdiction of the Hailey land office. The district as organized occupies a terri-

This route was still open for horses December 15, though liable to close at any storm.

It is yet undecided as to how a road will be built into the camp. The Boise people are in favor of a road from Bear Valley, while the Weiser and Grangeville people are in favor of the Warren route. It will probably devolve upon the Thunder Mountain Gold and Silver Mining and Milling Company to settle the question, as the company is largely interested and needs a wagon road before any extensive work can be done. Col. Dewey, the president of this company, has a railroad now at Middletown, Idaho, and will extend to Emmett, on



tory of about 600 square miles; its northern boundary is Big Creek, a tributary of the Middle Fork of Salmon River; its eastern boundary is the Middle Fork; its western boundary is Quartz Creek, and its southern boundary is a branch of the South Fork of Salmon River, and Indian Creek, the last named creek being a tributary of the Middle Fork.

There are at present two principal routes of travel into the camp, both trails. One is from Bear Valley, which is situated on the State wagon road leading from Boise to Salmon City, a distance of 85 miles; the other is from Warren, the terminus of the state road from Meadows, 65 miles. The route from Bear Valley is over a high divide and one that is snowed up from October 15 to June 1, and is entirely devoid of any settlements along the way. The Warren route also has its difficulties in way of ranges to overcome, but it is the old government trail built during the Sheepeater trouble in the seventies, and along its course are ranches, and many small camps, where properties are being developed.

the Payette River. It would be an easy matter for him to extend his road to the Payette lakes, some 48 miles from Warren, then build a road by the Warren route, or nearly so. The nearest railroads to the camp at present are the Northern Pacific at Stites, Idaho, 108 miles from Warren, and the Pacific & Idaho Northern at Council, Idaho, 95 miles from Warren. The nearest railroad to Bear Valley is Ketchum, Idaho, Oregon Short Line Railway, 90 miles.

There are other trails leading into the camp from Dixie, 80 miles from Stites. The Dixie trail is about 85 miles, and goes via Chamberlain Basis and Big Creek, but possesses advantages of low summits to cross and a longer open season. There is also a trail across to Big Creek from the old Yellow Jacket Mine, in Lemhi County, 45 miles. Yellow Jacket is some 51 miles from Salmon City, and 120 miles from Red Rock, on the Utah & Northern Railroad.

The Dewey property lies in the southern part of

the district and comprises some 11 claims, on which there has been development going on for 14 months. A 10-stamp mill was packed in this summer. It is reported that this will be in operation in January. Some phenomenally rich ore has been developed on this property, and the country around it is staked for a number of miles. Provisions are scarce in the camp, and it is probable that many men will have to come out on snowshoes in a month or so, on this account. Flour has been sold at \$25 per 50 pounds at this early in the season, and no supplies are in sight outside of the Dewey Company's. The Dewey Company, it is claimed, will open the Warren trail for travel in April, but sooner than that, men going into the camp will have to pack provisions on their backs or pull it on a toboggan.

THE REVIVAL OF IRON MINING IN NEW JERSEY.

By F. W. E. MINDERMAN.

Iron mining in New Jersey has for many years been looked upon as a "has been," a worked out enterprise. Twenty years ago 7,000 miners found employment in Morris County, where the most extensive operations were carried on. The New Jersey State census reports of 1895 showed but 700 miners in that county. Now, however, it looks as if the county would again become of some importance in the iron world.

Mr. Joseph Wharton, of Philadelphia, who has two furnaces in blast at Port Oram, has recently begun the construction of a third furnace, to be in every respect the duplicate of the newer of the two now in blast. This last furnace has a hearth of 14 feet, measures 21 feet in the bosh, is 100 feet high, and has an average daily capacity of 400 tons of pig iron. Mr. Wharton is about to open a mine at Echo Lake, in the Pequannoc Valley, where recent magnetic surveys have shown the presence of a rich vein.

In addition to constructing a third blast furnace, Mr. Wharton has obtained control of the old Andover furnace at Phillipsburg, and is remodeling it. When No. 3 is completed, it is estimated that the Port Oram furnaces will consume 52,000 tons of iron ore per month, and there will also be necessary 10,800 tons per month for the Andover furnace. To secure this large quantity of ore it will be necessary for Mr. Wharton to develop all the ore properties he owns or controls in New Jersey. The mines he is now operating are the De Camp, Glendon, Andover and Wharton mines, at Hibernia, Morris County, and the Beach Glen at Black Glen, a few miles from Hibernia. In this latter mine, while sinking a new shaft, which is now down 330 feet, a 5-ft. vein was struck, the ore from which assayed 64 per cent metallic iron and 0.01 per cent phosphorus, a very superior quality of ore, well adapted for making bessemer iron.

The aggregate yield of the Wharton mines now being worked is 25,000 tons per month. Modern machinery is now being installed, and the yield will be largely increased, but will not be sufficient for the needs of the four blast furnaces. Hence Mr. Wharton contemplates the development of the Allen and Teabo mines in Morris County, located between the Richard Mine, the property of the Thomas Iron Company, and the Mount Hope Mines, now operated by the Empire Steel and Iron Company, of Cata-sauqua, Pa. The Allen and Teabo mines were abandoned years ago, but can be worked with profit under present methods. Work in these mines will be begun early this year. Mr. Wharton also recently acquired a tract of 400 acres, known as the Halsey tract, north of Lake Denmark, in Morris County, through which the Green Pond vein runs. Mining operations here were abandoned 15 years ago. Besides these holdings Mr. Wharton owns mineral rights on 40 acres at Echo Lake, where the magnetic surveys have been so encouraging that he will begin work at once.

At the Wharton mines at Hibernia, the improvements are very extensive. Among the new machinery is a large hoisting engine now being installed. It is

a double cylinder engine, each cylinder being 24 inches in diameter and having 42 inches stroke, direct connected. It is the largest hoisting engine of its type ever installed in Morris County, being calculated to lift five gross tons on a rope speed of 1,500 feet per minute. The engine was built at Newark, N. J. There are also being installed at this mine two Babcock & Wilcox boilers, in units of 250 h. p. each.

At this mine there is now in operation a magnetic "cobber." Heretofore the rock hoisted with the ore was picked out by hand, involving a cost of preparation of 25 cents per ton. By the use of the magnetic cobber the cost of separating is reduced to 2 cents per ton. This process of separating makes it possible to operate at a profit many mines yielding low grade ores which have for years been idle because it was impossible to work them under the mining conditions which formerly prevailed in Morris County. At the Hibernia Mine the ore is hoisted from the mine and dumped into bins, from which it drops through chutes to a jaw crusher, where it is crushed and is then raised by elevators and passed over a screen with 3-in. mesh. All the ore that is small enough falls upon a conveyor belt and is conveyed to the magnetic separator. This divides the stream into two parts, "heads" and "tails." The heads are passed on a conveyor belt to storage bins, and the tails are carried by a like contrivance to the other storage bins. The bins containing the heads are located close to the railroad, and self-releasing pressed steel ore cars with a capacity of 50 tons are run under the chutes and the ore is conveyed to the furnaces. The bins containing the tails, which assay 25 to 35 per cent metallic iron, are also alongside the railroad, and they are dropped through chutes into wooden, self-releasing ore cars, and hauled to a shaft directly over the Hibernia underground railroad. This lean ore is then dropped down the shaft 300 feet to a chute, under which the tunnel cars pass, and is conveyed in these to a concentrating mill located at the foot of Hibernia mountain. It is here crushed to ¼-inch mesh, and concentrated by means of a magnetic separator. The heads, which contain 57 per cent metallic iron, are sent to the furnaces, while the "tails" are sold for building purposes, being especially adapted for the making of concrete, iron ore sand being regarded by architects and contractors as the best material for concrete that is used.

From the time Wharton ore is shovelled into the skip at the bottom of the mine until the pig iron reaches the buyers, the raw material is not touched by hand. The ore goes through the process just described and is sent in the self-releasing steel cars to the furnaces, where it is dumped into the storage bins. From the bins it is dumped automatically into self-weighting electric cars and conveyed to the hoisting skip, again dumped automatically, and raised to the furnace top. The cast is run into 20-ton ladles standing on tracks, and carried to the casting machine, where it is poured off. From the casting machine it is carried on a belt conveyor to the cars, in which it is shipped away.

Other mines being operated in Morris County are the Richard Mine, owned by the Thomas Iron Company, which has been made to yield over 100,000 tons yearly by its present management; the Hurd Mines at Port Oram, operated by the New Jersey Iron Mining Company, and the Mt. Hope Mines, operated by the Empire Steel and Iron Company. Neither of the last two, however, yields as much as the Richard Mine.

GOLD MINING IN EASTERN OREGON.

By H. M. BEADLE.

The counties of Baker and Grant in Eastern Oregon are attracting the attention of capitalists and business men because of the many gold mines being opened therein. The mines are located in the spurs of the Blue Mountains. The town of Sumpter, which has been built up in the last two or three years, seems to be the center of the gold field. Both quartz and placer mines are being opened and promise to pay well under the development they are receiving.

The bedded rock in these mountains is slate, dis-

placed in many places by upheavals of granite, which in some localities are extensive, both slate and granite being cut by dikes of intrusive rocks. The strike of the veins is generally northeast and southwest, dipping to the southeast at an inclination of 75° to 80° from the horizontal. The veins are large and have the appearance of being true fissures.

The ore is quartz carrying considerable pyrites, but the greater part of it is easily mined and milled, and the cyanide process saves a large per cent of the gold. The ore has improved at depth so far, though no mine has been worked below a few hundred feet. The gold yield of this field is estimated at over three million dollars the last year, and this has been brought about by the development of the mines in the last five years. That the production will continue to increase rapidly for some years is apparent to all.

One of the most promising new properties in this region is the Oregon King, operated by a company bearing that name. It is in the Cracker Creek District, near Sumpter, directly south of the North Pole and Golconda, two of the great producers of that district, and is located upon the same vein. In the Oregon King the vein is some 40 feet wide, dipping to the southeast. The richer ore body is about 8 feet in width and lies along the foot wall. The property is developed by a tunnel running along the vein in the rich ore, with three crosscuts to the hanging wall. The tunnel has been driven over 200 feet, and it is about 200 feet below the apex of the vein. The ore has grown richer as the tunnel has been advanced, giving a return of over \$15 to the ton. In the last crosscut the ore between the tunnel and the hanging wall shows increased value. It will mill over \$5 a ton. The company will continue driving the tunnel until the length of the ore shoot is determined. A shaft will then be sunk to develop the vein at depth.

The Oregon King Company has also 40 acres of placer ground on the headwaters of Deer Creek. The company is building a dam, which is only 18 feet long, across a gorge above its ground. This will give the plant a large reservoir of water and a fall of several hundred feet. The placer has been thoroughly prospected by the company and it is expected to yield over \$1 a cubic yard for the greater part of the ground. The fall is sufficient to work the placer cheaply. A giant will be put in and when spring opens the work of breaking down the ground will begin.

The Oregon King Company has determined to erect a 10-stamp mill for the reduction of its ore, and a cyanide plant sufficiently large to treat the tailings. Before another year the company hopes to be producing largely, and the value of ore in the mine and in the placer ground should pay handsome dividends when the mill is erected and the mine further developed.

WELDING ALUMINUM.—In the Heraens process of welding aluminum, the operation consists of cleaning the surfaces of the metal to be joined, laying them together, and heating them carefully to the temperature at which the metal commences to soften, keeping at that temperature, and meanwhile hammering together to a perfect weld. It is important that the temperature be kept constant. If it rises too high the metal becomes short or granular, and commences to oxidize, a condition which renders the weld useless.

A GIGANTIC SCHEME.—A great scheme is suggested in the *Figaro*, of Paris, for the utilization of the rainfall of the Pyrenees. It is proposed to dam the valleys all along the chain, hold up all the mountain torrents in a series of artificial lakes, regulate the overflow, run it through turbines, and so generate electric power. It is calculated that no less than 10,000,000 horse-power could be obtained from the Pyrenean range, and this power could be supplied at about one-sixth of the cost of that produced by steam. There may be a few little difficulties to overcome—but the *Figaro* is not an engineer.

IRON MAKING AT PORT TOWNSEND. WASHINGTON.

By A. W. CLAPP.

The first of the year will witness the production of the first pig iron made in the State of Washington in more than a decade, at Irondale, 5 miles south of Port Townsend, on Port Townsend Bay.

Twenty years ago there was at this place a smelting plant that was built and run for a short time by the Puget Sound Iron Company, Texada ore being used. The smelter was finally closed down and the furnaces were allowed to go to ruin.

Some six months ago a company known as the Pacific Steel Company was formed of Pittsburg and McKeesport capital, with Homer H. Swaney at the head. Six months of hard work has placed the old plant of the Puget Sound Iron Company at

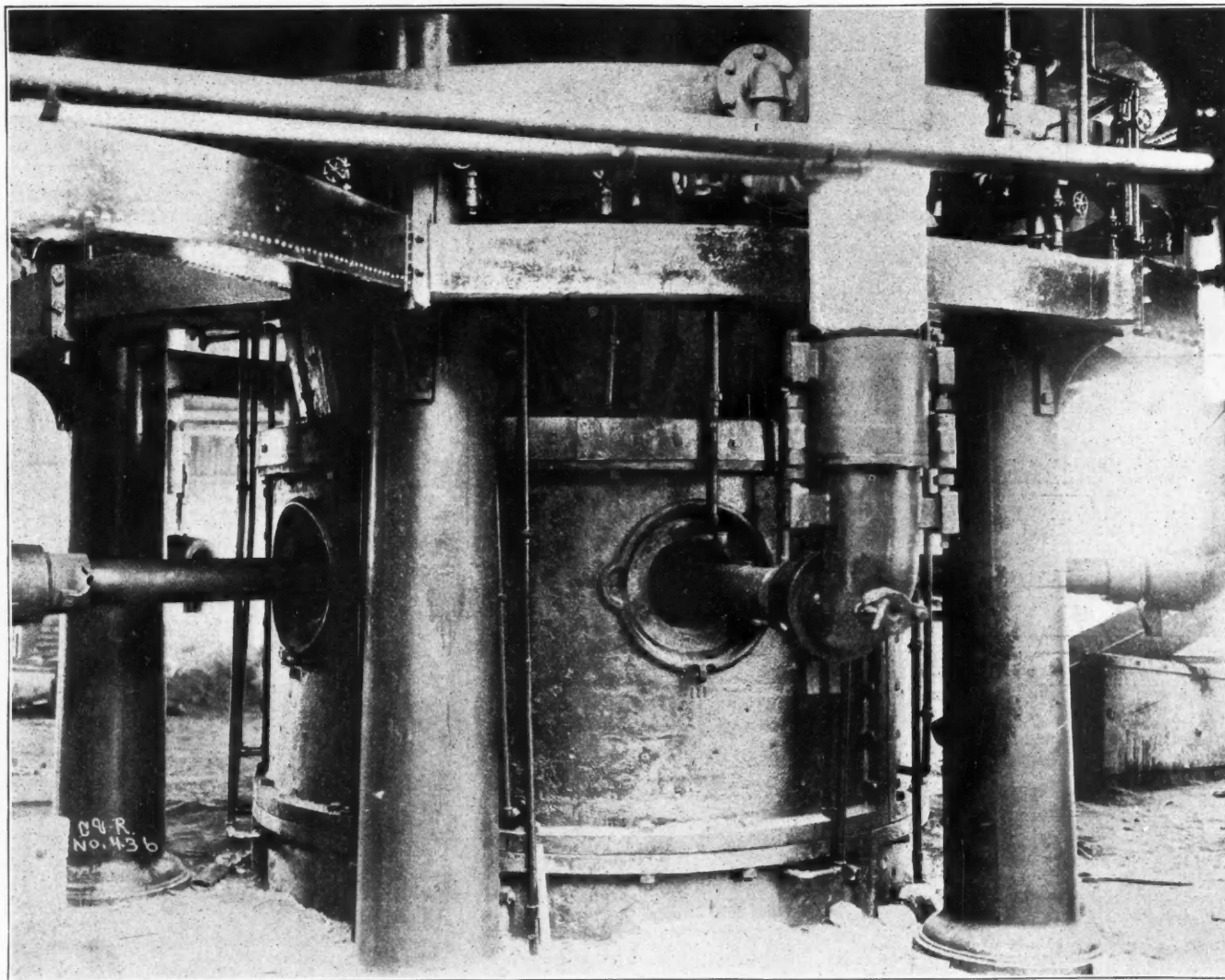
a complete business revolution of the Pacific Coast. Ship-building alone will in that case assume a great importance. The profitable production of pig iron at Irondale, while it will benefit Port Townsend primarily, will prove of even greater benefit to Seattle and other manufacturing cities of Puget Sound. It will not only remove an incubus from the ship-builders, but it will emancipate the cannery men of the entire coast, from the Gulf of California to Bering Sea, for one of the first industries to follow the successful production of pig iron will be a plant for the manufacture of tin-plates, upon the price of which greatly depends the profits of the canning industry.

It was last March that Mr. Swaney determined to begin operations at Irondale. Since that time a large force of men, brought out from McKeesport, have been engaged in placing the old smelter in re-

capacity a day. Power to drive the hoisting and ore crushing machinery will be furnished by a battery of four steam boilers, and large blowing engines will furnish the blast for the furnaces.

The ores of Texada Island, British Columbia, 130 miles distant are being used for the present and until the value of the company's own mines can be demonstrated. Here they will be loaded on scows, transported to the plant, and dumped into the bunkers by a powerful stream derrick. From the bunkers it is hauled in small cars and arranged in huge heaps each containing some 2,000 tons.

In order to render the smelting process easy, a low grade hematite, instead of black oxide, like the Texada ore, will be used in small quantities. This will be used as a "mix." It is found near Hamilton, in Skagit County.



BLAST FURNACE AT PORT TOWNSEND, WASH.

Irondale, which was in first class shape when it was abandoned, in even better condition than ever, and it is claimed that in a short time it will be turning out pig iron at the rate of 50 tons a day. For the present, a high grade magnetic ore from Texada Island, British Columbia, will be used.

For the first few weeks the new company will use coke from Skagit County for fuel, and a series of experiments with different Puget Sound and British Columbia cokes will be conducted. By this time the elaborate charcoal burning plant which the company is now installing will be in active operation, and thereafter charcoal alone will be used and a superior quality of charcoal pig iron produced.

The new company has done its work quietly, and is still ready to admit that its efforts may prove vain and its money wasted, but if it does succeed, the one essential to the complete realization of the brightest dreams of the future of the whole Pacific Coast will be accomplished.

The success of the Irondale experiment will mean

pair. The furnaces have been relined and alterations made which the engineers claim places it in better condition than it was when new. All the machinery for crushing and handling ore was overhauled and placed in perfect order. The steam plant was altered to secure more economical operation.

This refitting has been done under the direction of Mr. Henry Hall, of the Wellman-Seaver Engineering Company of Cleveland, Ohio. The alterations in the steel plant have been made by the company itself. Under the new company a new laboratory has been built and will be maintained with the most approved appliances.

The Irondale plant will employ directly and indirectly 300 men. One hundred will be employed about the smelter, the same number or more in the mines. Approximately 100 will be engaged in cutting wood for the charcoal plant.

In brief the new plant may be described as follows: The stack is 60 feet in height, 12 feet in the bosh, 6 feet on the crucible and of about 50 tons

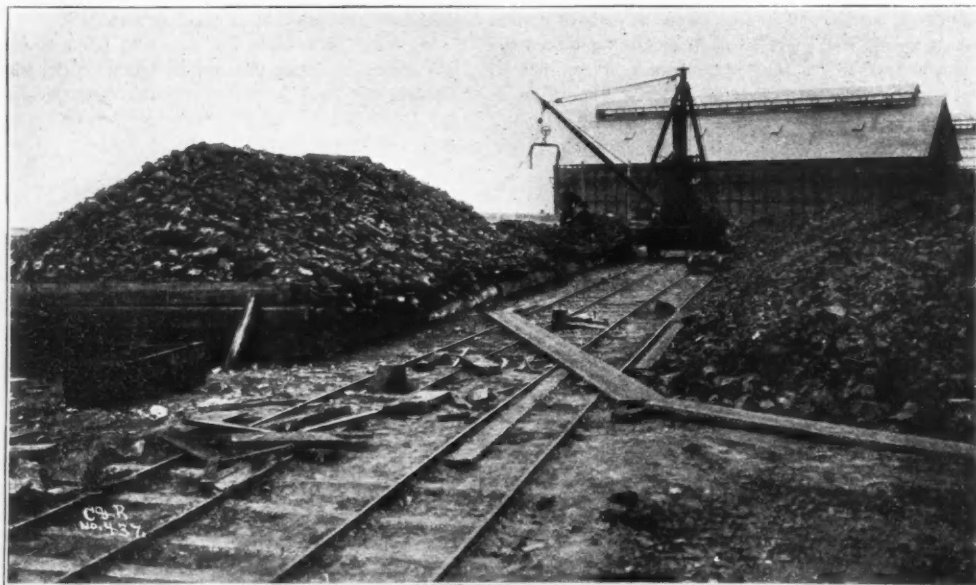
Around the plant are scattered many rusty pigs of iron which were left there when the furnace was abandoned. Many of these pigs contain iron of surprisingly good quality. In the offices of the new company are several samples of the old Irondale product, side by side with samples of the best grades of iron from eastern furnaces. The Puget Sound pig is superior to the eastern, as a general rule.

Limestone for fluxing purposes will be brought from the quarries in Roche Harbor. The coke, which will first be used at Irondale, will be brought from Cokedale, being transported in the same manner as the ore.

Experiments conducted by the Pacific Steel Company up to the present time have been rather flattering to the cokes of this State. All of it is rated as fairly good and one particular coke is stated to be of particularly fine character for iron-making. There are two faults with most of the coke so far tested. Some of them contain a little more phosphorus than they should have for use in steel mak-

ing, and most of them have more ash than the eastern coke. It is considered probable that more careful washing would greatly reduce the percentage of ash in the Washington cokes.

After the experiments with cokes of the State, have been made, the company will use charcoal exclusively. About \$6,000 has been expended in improvements and additions to the old charcoal plant. The original cost of this plant alone was a little over \$40,000. There are 20 kilns 30 feet high and



ORE IN THE YARDS AT PORT TOWNSEND, READY FOR ROASTING.

30 feet in diameter at the base and each will hold 75 cords of wood. In the old days the kilns were filled by hand, and this process the new company is now following but will not long continue to do so. The kilns will burn 180 cords of wood a day. If men were employed to cut wood to supply them, the cost would be enormous. The company is erecting machinery which will saw, split and convey the wood to the kilns automatically. At the present time a large quantity of charcoal is being burned under the supervision of a veteran charcoal burner brought to Irondale from Missouri, who has entire charge of the charcoal burning plant. The by-products of the distillation of the wood are at present wasted. In time, however, it is hoped to save them.

General Manager Swaney, of the steel company, says that it has been demonstrated in Germany and also in Michigan that wood can be distilled and a profit made by the sale of the by-products alone. That is to say, the charcoal could be thrown away and the burners still make money.

M. J. Carrigan, of Port Angeles, has rendered invaluable assistance in the development of the iron properties and the overhauling of the Irondale plant.

Senator Foster, of Tacoma, is one of the stockholders of the Pacific Steel Company and a member of the board of directors. Mr. Swaney speaks in high terms of the part taken by him in paving the way for the commencement of the work at Irondale, both by the investment of money and in many other ways. To Henry Hewitt, of Tacoma, who is interested with Senator Foster in the company, much credit is also due.

One phase of the Irondale experiment Mr. Swaney finds very encouraging. This is the cheapness of water transportation and the short distances ores and fuel will have to be brought to the blast furnace on Puget Sound compared with plants in the east, where ores are hauled many miles by rail or water, and sometimes both.

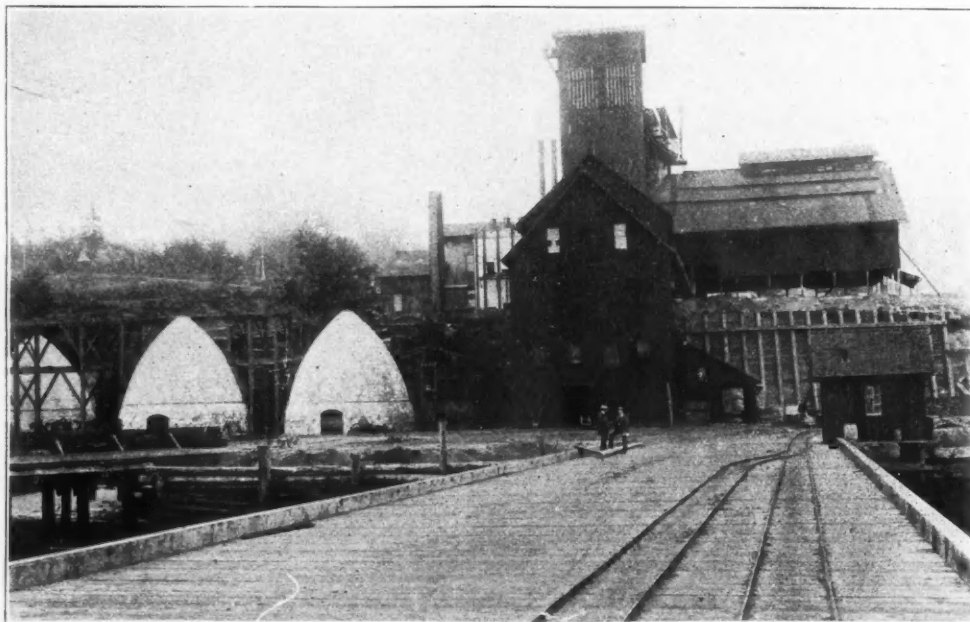
NATIONALITY OF ANTHRACITE MINE WORKERS.—The reports of the coal mine inspectors of Pennsylvania for 1901 contain for the first time statements of the nationality of the men employed in the mines. The report of Mr. William H.

Davies, of the Fifth Anthracite District, states that the total number of employes in and about the mines of the district is 15,638. The Americans number 4,541; English, 302; Welsh, 275; Scotch, 38; Irish, 1,156; German, 771; Poles, 1,623; Slavs, 1,932; Austrians, 327; Hungarians, 1,887; Italians, 1,135; Swedes, 47; French, 7; Bohemians, 2; Tyroleans, 210; Russians, 222; Lithuanians, 133; Greeks, 43; Swiss, 1; Dutch, 1. There are no Belgians nor Spaniards employed in the district.

the same period in 1900. This shows an increase of 50 per cent. The increase of 1,042,653 tons in the past year is due chiefly to the larger deliveries at Chicago and Milwaukee.

Bituminous.—From reports received we learn that there originated on the Pennsylvania Railroad Company's Lines East of Pittsburg and Erie, from January 1 to December 21, 1901, 19,183,171 short tons, against 19,726,547 tons in 1900; showing a decrease of 543,376 tons. The Huntington & Broad Top Railroad reported in the 11 months ending November 30, 1901, a total of 2,219,755 tons, of which 1,647,844 tons came from the Cumberland region and 571,996 tons from the Broad Top. As compared with the same time last year, there is an increase of 341,601 tons. The movement from the Beech Creek District in the year 1901 is given by the New York Central & Hudson River Railroad at 4,886,046 short tons.

In the 10 months ending October 31, 1901, the shipments over the Norfolk & Western road were 2,117,392 short tons to tidewater, and 2,739,050 tons to other points; a total of 4,856,372 tons or 46,811 tons more than in 1900, owing to the heavier movement to tidewater. From April to October, inclusive, the Baltimore & Ohio road shipped 8,474,610 tons. The tonnage originating on the Chesapeake & Ohio from June to October, inclusive, amounted to 2,259,157 short tons, as compared with 2,109,758 tons in the corresponding period in 1900, showing an increase of 149,399 tons. The 1901 shipments were 1,701,743 tons from New River, 512,061 tons from Kanawha, and 44,553 tons from Kentucky, all showing an improvement over 1900. The bulk of this coal went to tidewater points, while the movement west has fallen off somewhat. The coal



BLAST FURNACE AND CHARCOAL KILNS AT PORT TOWNSEND, WASHINGTON.

COAL AND COKE SHIPMENTS.

The heavy movement of coal and coke from producing districts in the past year has already been referred to in these columns. Below are given some statistics relating to the shipments of coal over a few of the principal carrying roads in 1901, with comparisons with 1900 where obtainable.

Anthracite.—The year 1901 showed a considerable increase over 1900 in the shipments over the different roads. It is estimated that over 53,000,000 tons were transported in the past year. The movement over the Pennsylvania Railroad alone from January 1 to December 31 amounted to 4,511,215 short tons, against 3,806,773 tons in 1900, an increase of 18 per cent. The Baltimore and Ohio reported for the 7 months from April 1 to October 31, 1901, a total of 585,039 tons. The receipts at ports on the Great Lakes during the 11 months ending November 30 were 3,158,707 short tons, against 2,116,054 tons in

mined in Ohio and shipped over 7 roads during the 11 months ending November 30, 1901, is reported by the Ohio Coal Traffic Association at 10,712,537 tons, chiefly over the Hocking Valley Railroad. It is interesting to note that the receipts of bituminous coal at ports on the Great Lakes in the 11 months ending November 30 were materially larger than 1900, owing to the heavy shipments to Superior, Duluth and Milwaukee. The comparative figures are 5,574,056 short tons in 1901, against 3,952,410 tons in 1900; an increase in the past year of 1,621,646 tons, or 29 per cent.

Coke.—Shipments have been large, owing to the great activity in the iron and steel industry. The movement over the Pennsylvania Railroad from January 1 to December 21, 1901, amounted to 7,893,076 short tons, against 7,048,580 tons in 1900; showing an increase of 854,496 tons. In the 11 months ending November 30 the New York Central

& Hudson River Road shipped from the Beech Creek District 146,500 tons. The Chesapeake & Ohio handled originally from June to October, 173,677 short tons, made from New River and Kanawha coal. As compared with the corresponding 5 months in 1900, there is an increase of 17,339 tons. The shipments over the Norfolk & Western road in the 10 months ending October 31, were 1,245,239 short tons, against 1,262,751 tons in 1900, the decrease being due to the smaller movement to other than tide-water points.

THE GOLD COAST, WEST AFRICA.

By OUR SPECIAL CORRESPONDENT.

In my last letter to you, I stated that the "Jungles," or the Gold Coast mines could not be classed in the same category as the Rand Mines, neither can they be classed with the Kalgoorlie Mines in Western Australia or the Cripple Creek gold fields, but there is no doubt that the Gold Coast may eventually settle down to a third-class mining district in some sections. Since July the market value of the shares has decreased several million pounds. Ashanti Gold Fields were talked to £100, selling at that time at £32, now below £20. Tarkwa and Abossi, Fanti, Wasson, etc., were all talked higher, and now have fallen even more than the others. The public may be congratulated that they bought Jungles only to a small extent. Somehow the British public fought shy of them for several reasons. The leading firms of engineers were not connected with the flotations; but few engineers of standing were sent to report, and the reports of the few who did were withheld from the public; in fact, the bulk of the business was confined to two London firms. Then again the method of flotation did not appeal to the public, as in but few cases did reports appear in prospectuses, and in these few cases the concessions were not examined, even superficially. All the concessions were "fabulously rich," native workings abandoned "showing unmistakably that gold could be obtained for the picking it up." I have yet to find native abandoned pits or workings rich; I do not say they have never been, but do not hesitate to say that such mines have rarely been found, whether in Mexico, Peru, Chile, Brazil, Spain, Rhodesia, Cornwall, Barberton or on the Gold Coast. The ancients knew how to mine as profitably—not as extensively—as we do to-day, and in a big majority of cases only the bones were left in surface workings.

The properties I was sent to examine were all reported upon by the vendor and his friend, and all the concessions showed three lines of reefs running northeast and southwest. One of the concessions was shown on the map as adjoining what was once a producing mine, whereas in point of fact it was 50 miles or three days' journey away through the bush. Yet the shares remained from £2 to £3 premium for some time. It has been stated that scores of companies were floated which will never do any work. An engineer would be sent out to examine, and occasionally one heard of panning and assays of gold several ounces to the ton, but of the majority one never heard a word. At the annual meeting of the Bibiani Company, held a few weeks ago, the cost of developments, etc., in the Gold Coast was £693, while the directors' fees were £1,372 for the same period. The directors of one of the Gold Coast companies were honest to the shareholders, as they published the cable from their engineer: "Concession absolutely worthless, useless to remain." The engineer was cabled to examine another property, and a cable was recently published: "Substituted area worthless."

There is gold in the Gold Coast, but the questions of climate, transport and labor have to be reckoned with, and for 10 or 15 years the mines which will pay dividends must of necessity be few. Great stress is laid on the Secondi & Tarkwa Railway as a means of communication to all the mines, but such is not the case. The Tarkwa Mine is on the line, and the

Wassau Banket Reef not far away, but Prestea and Broomassie, the principal mines, are about one day's journey distant. Navigation by the rivers is not as easy as is claimed by some. One engineer estimated the cost of making the Ankroba River navigable for small steamers to Broomassie, a distance of 80 miles, at £2,000,000.

The country is by no means a sanitarium, nor likely to be so for some time to come, if at all. It is well known that in the early days of the Lake Superior Copper Mines, scurvy was prevalent, and that in the lead mines of Missouri malaria claimed not a few victims, but both districts are now as healthy as any ordinary mining camp. The reason of this is not far to be sought, seeing that these camps were peopled by a most progressive race, and their situations were in the north temperate zone; whereas in the case of the Gold Coast mines they are in the tropics, and are inhabited by idle natives who rarely if ever work, and then only by compulsion. Speaking to one about to move to the Gold Coast, I would advise him to take but little luggage, not more than is absolutely necessary, and to have the same packed in tin boxes, as leather goods, unless in daily use, soon mildew and become rotten. A leather belt which I saw at the Tarkwa Mine, after but 3 years' rest, was as soft as ordinary paper. It used to be stated that men of fair complexion, with blue or gray eyes, could stand the climate better than their brown-eyed brothers, and again others stated that thin men could endure more than the corpulent. It is, however, more evidently a case of constitution. A man of vigorous constitution and of good, steady habits, can throw off the fever, whereas one of a weak constitution would have to succumb. The clerks and officials who seemed to bear the effects of the climate best were those who began work at 6 a. m., after a cup of tea, breakfast at 11, rest till 2 p. m., tea at 4 p. m., dinner at 7 p. m., and retire at 9 p. m. For mining engineers on the field it is best to take a cup of tea and an early start, say at 7 a. m., when the fog is light; but as a rule 8.30 is time enough; then work until 11 or 12, and rest for two hours, afterwards working till 5 p. m.

GOLD MINING IN COLOMBIA, SOUTH AMERICA.

By I. DAVIDOV.

On account of the rebellion which has been in progress in Colombia for the past year and a half, many of the mines have been forced to close down, because it was impossible to secure labor. Many men have been drafted into the army, others forced into it, and others have secluded themselves in the mountains, in order to avoid being impressed into service. In no case, however, have I learned of a single attempt by Conservatives or Liberals to destroy works or disturb any of the foreign companies in their property rights. The situation on account of the rebellion, however, was advantageous to the securing of desirable contracts for purchase of valuable gold properties; and, for this reason, I made a special study of the gold fields, traveling quite extensively over the placer zone situated on the Magdalena, upper part of the Cauca, Nechi and Porce rivers and their tributaries, in the Department of Antioquia.

The placer properties in this section offer great advantages to capital able to purchase the same from the owners. I have found the bed of gravel varying from 15 to 35 feet, and all pay gravel from the grass roots down. The first six or eight feet will average from 15 to 30 cents per cubic yard. Below six feet we may count safely on from 75 cents to \$1.00 per cubic yard, till we come within three feet of bed rock, when nuggets are found, and it is almost impossible to estimate the value of the gravel. It would be safe, however, to say one can count on from \$2.50 to \$7.00 per cubic yard on the two or three feet next bed rock. Water is plentiful in this section, though sometimes it has to be pumped from the river bed and the gold obtained by sluicing. At other times there is sufficient fall, so that monitors can be used; and, when this is the case, of

course the cost of mining is considerably lessened. I have taken out considerable gold in my experimental work and estimate the cost of either sluicing or the Little Giant to average, under economical and honest management, from 20 per cent to 25 per cent of the gross product.

The situation in Colombia seems to promise that peace will be established early in 1902. Be that as it may, it is safe to say within two months after peace is established the boom in these gold fields will begin. French and English, as well as New York, Chicago and Boston companies are working here, and all have shown by their prospect work that large profits will be realized as soon as the situation will permit them to secure the needed labor. Considerable machinery has gone forward during the rebellion, and there is now at Barranquilla several hundred tons of mining machinery, waiting transportation to the various mines.

Being familiar with the gold fields of Siberia and Alaska, by long employment in them, and fairly familiar by study and experience with many others throughout the world, I feel safe in saying that this gold field of Antioquia, Colombia, is one of the most promising known, and that it will produce great profits to the investors, if only the management is conducted properly.

THE SYDNEY HARBOR COLLIERIES.

The *Australian Mining Standard*, of November 28, says that one of the most momentous events which have been recorded of late is the striking of coal in the Birthday shaft of the Sydney Harbor collieries. The coal is of excellent quality, and it follows that in addition to the magnificent facilities afforded by her splendid harbor Sydney now possesses good coal. The arrangements are such that the coal can be delivered direct from the screens into the hold of the vessels waiting to receive it. The powerful machinery which will be used by the company will accomplish the work with the greatest expedition, and as there is a depth of 26 feet alongside the wharf at low water, and the length (580 feet) is adequate for all reasonable requirements, it would appear that very large vessels can coal there with great dispatch and convenience. The advantage that will be possessed by the Sydney Harbor collieries in this respect is very obvious and striking. Helensburg is the nearest point to Sydney at which coal has as yet been raised. The distance is 26 miles by rail from Sydney, consequently there is considerable land carriage before it can be delivered in the metropolis. Coal from some of the other southern collieries reaches Sydney by water, but the cost of transport, though small, is still appreciable. Coal from Newcastle comes 100 miles by water, and has to be drawn by rail in some cases for considerable distances before it can be put on board the colliers. Coal from Lithgow has to bear the expense of nearly 100 miles of railway carriage, so that the coal which is raised on the shore of the harbor itself will have a great advantage in competition. Against this must be set the great depth of the seam. This circumstance entailed great expenditure on the company in order to reach the coal, and will involve a certain amount of extra cost in hauling and working the colliery. In view, however, of the advantage of propinquity to the best market in the southern hemisphere, any drawback of this nature will probably be found to be comparatively trivial. The company's authorities to mine extend over an area of over 10,000 acres, underlying the waters of the harbor, and it is computed, assuming the Bulli seam to retain its characteristics in this locality, that the quantity of coal available for working which it contains is about 113,000,000 tons. The company expected to expend £300,000 before beginning to earn any profits. This, indeed, is a very moderate estimate in view of the fact that the circular shaft, which is now being sunk, is 2,890 feet deep, 20 feet in diameter, and bricked from top to bottom, and that another shaft of similar depth and dimensions will have to be sunk before the working arrange-

ments will be complete. The equipment of the colliery will also be on a scale commensurate with the magnitude and importance of the undertaking, and will therefore entail a very large outlay.

There is still much work to be done before the colliery will be in full working order. Now that it is proved, however, beyond all doubt that the coal is where it was expected to be, all the rest, though it will take time, will be comparatively plain sailing.

LIQUID FUEL IN OPEN-HEARTH STEEL FURNACES.—The latest application of mazout-petroleum residuum is to firing Siemens-Martin furnaces, either by the method of allowing the oil to fall drop by drop, or by that of reducing it to a finely-divided state, which latter is found to give the better results, the quantity of mazout employed being only 20, and sometimes even 18 per cent by weight of the steel produced, while the life of the ovens and number of charges are at least equal to those with the use of coal gas. The latest improvement consists in leading the naphtha refuse directly into the furnace by the inner of two concentric pipes, the outer leading up air under great pressure, by means of which arrangement perfect combustion is ensured, because the finely-divided oil is brought into intimate contact with air previously heated. As compared with coal-firing, the advantages by that with naphtha refuse are thus summed up by the *Jernkontorets Annaler*. (1) The maintenance and tending of an oil station cost less than those of a gas-producer plant. (2) the furnace temperature can be better and more easily regulated; (3) turning the oil gas on and off is the work of a moment; (4) the use of the furnace may be interrupted for a longer or shorter period without difficulty or loss of fuel; (5) a higher furnace temperature is attained than with coal gas, without condensation, and (6) the oil gas constitutes a fuel absolutely free sulphur.

AMERICAN VS. BRITISH COAL IN THE MEDITERRANEAN.

The London Board of Trade has received, through the Foreign Office, copy of a report by Mr. Gurney, H. M. Consul at Marseilles, on the competition of American coal with British coal in Mediterranean ports. An abstract of the report is published in the *Coal and Iron Trades Review*.

Mr. Gurney states that American coal imports at Marseilles have increased rapidly during the past three years. Rising suddenly to 118,491 tons imported during 1900, the coal imported from the United States during the first nine months of 1901 has reached the fair total of nearly 175,000 tons. It is estimated that the total imports for 1901 will exceed 200,000 tons. In Mr. Gurney's opinion American competition will only become dangerous to British coal if (1) high prices continue at home, and (2) if the American shipping interest succeeds in securing the passing of the Bounty Bill in 1902.

Further on, the Consul reports that the exorbitant price of coal in 1899 and 1900, gave the Americans an opportunity of securing a certain number of contracts. At the close of 1900, under the impression of the rise holding, several large contracts were made for delivery over 1901 at Marseilles.

Owing, however, to the unexpected fall in prices and freights, these contracts have been deeply regretted. British liners were, at the date of the report, taking American small coal at Marseilles, but it is coal on which the importers have lost heavily. The great contracts for American coal made in 1900 have now worked off, and are not likely to be renewed under present conditions. . . . Americans are not making offers for forward delivery at anything like the prices at which Cardiff coal can be bought. The whole matter is one of prices and freights, which are for the present in favor of British coal.

The Consul states it as his opinion that the inflated prices of British coal have done the British coal trade a considerable amount of harm. Americans have been able to get their coal on the market, and this alone has considerably modified things in

their favor. American steam coal has been tried, and found to be, in quality, far superior to expectation. The old prejudice against it is beginning to disappear. The difference in firing value between British and competing American qualities, hitherto estimated at 10 per cent in favor of the British, has already come down to 7 per cent. Americans hope before long to be able to convince their customers in the Mediterranean, by practical experience, that the difference in results is solely due to European ignorance in the handling and firing of their coals. Indeed, they have already succeeded in doing this to an appreciable extent during 1901.

MINING IN THE URAL.

An interesting contribution on the present condition of the mines and metallurgical establishments of the Ural District in Russia was published recently in the *Revue Universelle des Mines*. It is written by Mr. Spilberg, who is engineer of the Orel-Witebsk tramways. One of the greatest obstacles to the development of the mineral industry in the Ural is the lack of capital and the difficulty of raising money, even on excellent security. At the last Ural Mining Congress in Ekaterinburg, in January, 1901, the establishment of a bank in that city was discussed. It was thought that capital could be best applied through the medium of an industrial bank.

Another subject considered was the better classification of pig iron and the adoption of a uniform nomenclature and grading of iron railroad rates were also discussed. The better operation of the coal mines and a more regular supply of fuel were also important questions brought up in the congress.

To improve transportation the construction of three new railroad lines, all of which have been surveyed and located, was urged upon the Government. The first of these is a line from Heviansk through Irbit to Tavda, with a branch to Bogdanovitch on the Perm Railroad. This branch will furnish transportation to the coal mines of Egorchinsk. The second proposed line is from Berdiaouch on the Samara-Zlatoust Railroad to the Livensk Iron Works, with a branch towards Ekaterinburg. This road will give connection with the main line of the Siberian Railroad. The third line is the South Ural Railroad, to extend from Oufa, on the Samara-Zlatoust road to Magnitnaia, with branches to the Komarovsk and the Bieloretzk mines.

The construction of these roads will go far towards solving the question of fuel supply, and will enable the iron works of the Urals to reach directly the markets of Siberia.

AN UNPROSPECTED REGION IN CALIFORNIA.

BY OUR SPECIAL CORRESPONDENT.

In the southeastern or "desert" portion of California lying between the Colorado River on one side, the line of the Southern Pacific Railroad crossing at Yuma on another, and the line of the Atchison, Topeka & Santa Fe crossing at Needles on the third side, is a large tract of territory which is practically unprospected. This triangle includes portions of San Diego, Riverside and San Bernardino counties. Those sections lying contiguous to the two railroad lines have several producing mines, but those further back, and those near the river are still undeveloped, owing to lack of transportation facilities. A new line of steamers on the river running from Yuma to the Needles, or Mellen, near the latter place, will be useful to the mines both in Arizona and California. The line has recently started with two steamers. On the California side, however, except about Pichacho, little has been done in a mining way.

There has been little inducement to prospect or develop at any distance from the railroads or the river, and as a result there is a very extensive area where little or nothing has yet been done. There are, however, known mines of gold, silver and cop-

per, large deposits of salt and other minerals. And throughout this desert region there are many possibilities for the miner, could he but get supplies in and ship his products out.

Prospecting and mining in the region in question has been done in a desultory fashion for years, but owing to the poor facilities but little has been done. The region is an arid one. With a few established camps there would be headquarters for supplies and doubtless numerous prospectors would go to work. Since the camps at Johannesburg and Randsburg in Kern County came into being the prospectors have gone from there into Inyo and San Bernardino counties, and found numbers of mines in that desert region. They would not have been tempted in that direction unless they had these towns as a base of operations. Doubtless with other camps south and east of the railroad lines the prospectors would push still further. At any rate there is a wide field for them in the region referred to.

ACETYLENE GAS FOR LIGHTHOUSES.

Recent experiments with acetylene gas as an illuminant, carried out at Genoa lighthouse, proved highly successful. The acetylene light at Genoa was plainly visible at the island of Tino, 40 miles distant, though the electric light from the lighthouse at Tino was invisible at Genoa. The fog-penetrating power of acetylene could, of course, not be tested, as fogs are rare at Genoa, and are of short duration; nevertheless, the Italian Government is quite satisfied with recent tests with the apparatus employed, which was manufactured by Mr. Filiberte Ferraccin, at Savona.

BORING MINE SHAFTS IN GERMANY.

The London *Colliery Guardian* notes that in an arrangement for boring mine shafts designed by Adolf Goldammer, of the Hildegard Mine, near Lichtenfeld, Germany, the cutters of a revolving two-winged boring bit attached to the under end of the suction pipe of a Gheiser pump are one of them smooth and the other toothed, so that the teeth of one wing act upon the shaft bottom at the place which has already been made smooth by the other wing, and therefore only small pieces of rock are detached, which can easily be taken up to the surface through the delivery pipe of the pump. In addition to this advantage, each wing of the boring bit consists of two parts connected together by a hinged joint, but susceptible of being made fast so that one can form a continuation of the other, in order to permit of their being arranged for boring shafts of small diameter.

COATING COAL-DUST BRIQUETTES.

A rapidly drying substance for coating coal briquettes, patented by Ludwig Sender, of Griesheim-am-Mein, Germany, consists of tar, resin, and from 10 to 20 per cent of burnt and powdered lime, in which mixture, when heated, the briquettes are immersed.

KANSAS AS AN OIL STATE.

BY OUR SPECIAL CORRESPONDENT.

What promises to be a great oil field has suddenly sprung into prominence in the vicinity of Chanute, Kan., and excitement, at first local, has extended rapidly. Many oil men—speculators and investors alike—are on the ground to confirm reports of important discoveries in oil and gas.

Chanute is a thriving city of over 5,000 inhabitants, located on branch lines of the Santa Fe, and the Missouri, Kansas & Texas systems of railroads, in the valley of the Neosho River, from which the county derives its name. Until quite recently, Chanute was a quiet agricultural town with no unusual aspirations. Some years ago the adjacent country was thoroughly prospected by Guffy & Galey in the interest of the Standard Oil Company; some traces of oil were reported and the community had dreams of a new life, but with the departure of the drills and apparent indifference shown by those in-

terested, the people relapsed into their former quiet ways. Kansas people have long since learned to recover quickly, and to look with suspicion on any movement which partakes of a "boom."

Whether or not the presence of oil of good quality and in great quantity was discovered by the "big" company is not known, but every land owner or inhabitant believes that it was smothered, and thereby hangs a tale. The Standard Oil Company cannot now lease a piece of ground and the independent companies are having their own way.

Chanute oil has a specific gravity of 33, and is considered equal to that of Indiana and Ohio. It is vastly superior in percentage of light oils to Beaumont petroleum—three or four to one; it can be refined to great advantage and now finds a ready sale. These wells do not gush, but yield a heavy flow under compressed air pumps, and the superior quality of the Chanute oil, with the extensive area, now proven, suggests great ultimate possibilities.

Chanute has come suddenly to a realization of earlier dreams, and the establishment of industrial plants to utilize the gas, such as smelters for zinc and lead ores from the adjacent fields of Southwest Missouri, for precious metals from Colorado, extensive brick works, glass factories, oil refineries, etc., seems now an assured fact. Already strong companies recently organized have acquired large holdings and active operations have begun. Sixty oil wells are now producing, several more are capped waiting pipe line connections, and many drills are at work.

The oil sand is found from 700 to 800 feet from the surface. Underlying the oil strata gas is found, some wells flowing from 5,000,000 to 8,000,000 cubic feet per day. The gas has been offered free to manufacturing plants and the oil is now selling at from 90 cents to \$1.25 per barrel.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALY REPORTED.

IMPLIED ALLEGATIONS IN APPLICATIONS FOR PATENT.—An application for a patent for a mining claim carries with it an implied, if not an express, allegation that the location was made upon land at the time open to location, and was, therefore, prior to the location of any one else; and the issue by the Government of a patent therefore conclusively determines the priority of that location over any other, and confers upon the patentee not only the title to the entire surface of the claim but also all extralateral rights given by the statute, as against the owner of an unpatented conflicting claim.—*Bunker Hill & Sullivan Mining Company vs. Empire State Idaho Mining Company* (109 *Federal Reporter*, 539); United States Circuit Court of Appeals.

UNDERGROUND AND SURFACE RIGHTS.—The law contains nothing granting, under any circumstances, to a claim owner, a greater length of the discovered ledge under ground than he owns at its apex; hence when two claims overlap along the apex of a ledge, although the end lines of the senior location converge and meet within the other claim, so as to terminate the rights of its owner at that point, the owner of the junior claim cannot take up the ledge in its downward course beyond such point, and continue to follow it within the limits of his own end lines, but his underground ownership of the ledge is bounded by the extension of the plane passing through the line of the senior claim, which bounds his rights along the apex, where such line and his own end line, which marks the other boundary, converge in the direction of the dip of the vein.—*Bunker Hill & Sullivan Mining and Concentrating Company vs. Empire State Idaho Mining and Development Company* (108 *Federal Reporter*, 189); United States Circuit Court for Idaho.

WATER PRIVILEGES SUBJECT TO PRIOR VESTED RIGHTS.—Although privileges and appurtenances

necessary to the enjoyment of the thing granted pass with the grant, the laws of the United States (Revised Statutes, Section 2339, 2340), providing that, whenever rights to the use of water for mining purposes have vested, the owners shall be protected in the same, and that all patents shall be subject to vested water rights, do not operate to give the owner of a mill site, who has acquired a vested right, to water for the operation of the mill, a superior title to the land on which the mill is situated, as against the claimant of a lode location in the land on which the mill is situated. Section 2337, authorizing the patenting of land for mill sites by mill owners not owning mines in connection with same, does not entitle such independent mill owner to patent a mill site located on mineral lands. Where a lode claim was discovered outside the lines of a mill site location, but the boundaries of the lode claim were projected so as to include a portion of the mill site, such action was not a trespass, and hence the contention that, as the title to a mining claim cannot be initiated by a trespass, the mill site was not subject to location by the lode claimant, was not untenable.

The district rule of the Enterprise Mining District, permitting the location of mill sites without regard to the character of the land on which they are located, sanctioned by the territorial legislature in 1868, is in conflict with the laws of the United States (Revised Statutes, Section 2337), providing that mill sites can only be located legally on non-mineral lands, and hence a person who had established a mill site on mineral lands in such district prior to 1868 was not entitled to hold the same as against a party claiming the land as a lode location.—*Cleary v. Skiffich* (65 *Pacific Reporter*, 59); Supreme Court of Colorado.

SUFFICIENT EVIDENCE TO PROVE WORK DONE.—On an issue as to whether or not a party had performed the annual assessment work on a mining claim, it appeared that he had employed a person who testified that he did 20 days' work in the tunnel, of the reasonable value of \$5 per day, but could not say how far he had extended the tunnel. Witnesses for the other party testified that from their knowledge of such person's employment and appearance of the mine and dump, he had not performed the requisite amount of work, and that there was no perceptible change in the tunnel; but there was evidence that from the condition of the walls of the tunnel at the time such witnesses inspected it, it would be impossible to tell the amount of work done. One witness testified that in 1897 he measured the tunnel by stepping it so as to ascertain whether the requisite amount of work had been done that year, and that it measured 50 feet. No work had been done since, except by the person said to have been employed to do the assessment work and the tunnel afterward measured 70 feet. It was held to be sufficient proof to sustain a finding that there was no forfeiture for not having done the assessment work.

Where parties deeming a mine forfeited located the same ground, and the others subsequently commenced work thereon, and a few days afterward such parties also began work, the prior claimant could commence an action under the laws of Oregon (Hill's Annual Laws, Section 504), giving an action in equity to one in possession of real estate to settle an adverse claim to same, and he need not resort to an action of ejectment.

Where the grantors of the prior claimant located a mine in 1889, but did not mark the boundaries on the ground until six months afterward, others who located in 1899 could not complain, as a subsequent locator cannot object if the boundaries are marked before his location.—*Crown Point Gold Mining Company v. Crismon* (65 *Pacific* 87); Supreme Court of Oregon.

Under the laws of the United States (Section 2324), providing that, on the failure of a claimant to perform the requisite amount of work on a mine, it shall be open to relocation, unless the original locators shall have resumed work on the claim before such relocation, so where one in good faith resumed

work on a mine previously located by him, the day before the other's relocation, he has a superior right to same.—*Emerson vs. McWhirter* (65 *Pacific Reporter*, 1037); Supreme Court of California.

ABSTRACTS OF OFFICIAL REPORTS.

New Guadalcazar Quicksilver Mines, Limited, Mexico.

The report of this company as issued from the London office shows that the total proceeds for the year ending August 31, 1901, from sales of quicksilver amounted to £5,148. The working expenses included £2,259 for wages, stores, etc., and £1,479 for general expenses, taxes, etc., in Mexico. The expenses of the London office were £826. The total balance shown by the profit and loss account at the close of the year was £776. The net result for the year, after charging a proper amount for depreciation and for reconstructing the furnaces, was a loss of £259.

During the first half of the year there was a considerable falling off in the output of ore, and at the same time the tenor in quicksilver was lower. The second half of the year, however, showed an improvement in both respects. The extraction of ore for the year was 1,698 tons of 2,000 pounds, being 86 tons less than in 1900. The proportion of quicksilver in the ore last year was 1.09 per cent, against 1.33 per cent in 1900. Nearly all the falling off was from the San Juan workings. The Santa Clara Mine, on the other hand, showed considerable improvement.

The ore treated by the furnaces was 1,588 tons, and the recovery of quicksilver was 367 flasks, or 27,540 pounds. The furnace work shows that 80.55 per cent of the assay value was recorded against 83.07 per cent in the previous year. Of the two furnaces in use one has been in operation for ten years and the other for six years. They have had frequent and extensive repairs, but, nevertheless, the loss in furnacing the ore continued to increase, and it was finally decided to rebuild both of them. The work was commenced early in July, and from that time no ore was treated. No. 1 furnace, however, has since been completed and started up.

The new drift in the mine was completed and for a time realized the object in making it—the improved ventilation of the workings. The latter, however, have been so far advanced as to make it necessary to get another drift, which, when completed, will supply air sufficient for over a mile and a half of the underground workings. The plant and works are reported in good order.

Mount Lyell Mining and Railway Company, Tasmania.

The latest report of this company covers the half year ending September 30, 1901. The working account shows that the receipts for blister copper, after deducting £66,003 for ore purchased, was £375,614. The receipts from the railroad were £21,378. The expenses reported were for mining and removing overburden, £31,313; smelting expenses, £128,442; converting copper, £17,840; freight and refining charges on copper, £44,097; railroad expense, £14,990. The total expenses were £236,682, leaving a profit of £160,310 for the half year. After deducting depreciation and reserve fund charges dividends amounting to £61,875 were paid.

The report of Mr. Robert Sticht, manager, shows that the system of open-workings was continued during the half year. The quantity of ore taken out was 125,850 dry tons from the open-cut and 8,686 tons on the underground workings, making a total of 134,536 tons. In the underground explorations the total advance made was 282 feet in sinking and 615 feet in driving and cross-cutting. The main supply of ore was derived, as heretofore, from the Mount Lyell property. The South Tharsis property was actively worked and provided a satisfactory quantity of metal-bearing flux. Some work was done on the Royal Tharsis property, but little was taken

from that property as a sufficient supply of flux was secured without it.

Smelting operations were carried on during the half year regularly with little change. The amount of material charged in the blast furnaces was 239,909 tons, made up as follows: Mount Lyell ore, 135,511 tons; purchased ore, 39,592; metal-bearing flux, 10,489; flue dust, 3,726; first matte, 41,568; converter slags, 7,539; converter linings, 1,484 tons. The quantity of matte made and sent to the converters was 12,630 tons, having an average assay of 44.6 per cent copper, 26 ounces silver and 0.83 ounce gold. The production from the converters was 5,066 tons of blister copper, containing 5,005 tons fine copper; 314,315 ounces silver, and 10,405 ounces of gold.

The supply of water during the year was good, enabling operations to continue without delay. Some additional coke ovens were built at Port Kembla, the experimental manufacture of its own coke by the company having resulted very satisfactorily. There are now 62 coke ovens at that point, and the supply is quite sufficient for the company's use.

The cost of producing blister copper for the half year was equal to \$5.13 per ton of ore, made up of the following items: mining, \$0.62; removal of overburden, \$1.50; smelting, \$2.52; converting, \$0.49. The total shows a decrease of \$0.63 per ton as compared with the previous half year.

Alaska Goldfields, Limited.

The report of this proprietary company, which owns large interests in the Alaska Exploration Company, the Northern Commercial Company, and the Northern Navigation Company, shows that no profit resulted from the operation during the year ending June 30, 1901. The Alaska Exploration Company made a net profit of \$85,107, but was unable to declare a dividend as the profit was represented by assets other than cash. The report says that in June last the Alaska Exploration Company entered into an agreement with the Alaska Commercial Company and the Empire Transportation Company to amalgamate that portion of the business relating to trade and transportation. Under the agreement two companies have been organized, known as the Northern Commercial Company, and the Northern Navigation Company. The Northern Commercial Company has an authorized capital of \$2,750,000 in stock, and \$2,250,000 in bonds, and has also authority to increase the bond issue by \$2,000,000. The total amounts issued up to date are \$1,551,400 in stock and \$2,549,000 in bonds bearing 5 per cent interest. The Northern Navigation Company has an authorized capital of \$1,750,000 stock and \$1,500,000 in bonds. The amounts issued up to date have been \$1,064,900 stock and \$1,061,000 in bonds. All the warehouses, merchandise, steamers, etc., of the Alaska Exploration Company were transferred to the two new companies, payment being made in stock and bonds.

The report of the president of the Alaska Goldfields, Mr. J. Liebes, which is dated from San Francisco, refers to the above transfer and says that this was made necessary by the fact that trading at Dawson and in the Yukon District generally has undergone very great changes, competition now being very keen and prices having descended to a level approximating that found in other parts of the commercial world. The stations outside of Dawson on the Yukon have not been profitable as a rule, owing to the shifting character of the population and the failure of prospectors at many points. This also applies to the stations on Norton Sound and at Nome. It is believed, however, that with the consolidation of trade interests there will be a very great improvement in this respect.

In the mining division of the property options have been taken on a number of claims, some of which were abandoned as unprofitable, while others are still held. The prospectors employed by the company succeeded in locating some good gold-bearing properties in the Golovin Bay District, most of which have been transferred to two new companies—one known as the Sweetcake Mining Company, and the other as the Goldfields Mining Com-

pany, in both of which the Alaska Goldfields holds large interests. The company still holds a number of claims in the Nome District, but working of these has been delayed by litigation over titles and other causes. It is believed, however, that as long as these claims can be properly handled a considerable profit can be derived from them.

Sometime ago a coal mine proposition was presented to the company's agent at Dawson and appeared so favorable that the original locators were bought out and developments undertaken. The experts' report says that there is a large coal deposit included in the property, which is situated on Rock Creek, a tributary of the Klondike River, and is about 21 miles from Dawson. As work progressed on development it was found that the vein of coal was parted by a seam of frozen earth and ice, which made it necessary to use a thawing process to remove the objectionable material from the coal. Some money was spent in trying to overcome this, and as further depth was attained the parting disappeared and the exploration drift is now in clear coal. It is believed that this property will become extremely valuable in view of the scarcity of fuel in the Yukon country.

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail prices. These notices do not supersede review in a subsequent issue of the ENGINEERING AND MINING JOURNAL.

Victoria. Annual Report of the Secretary for Mines and Water Supply. J. Travis, Acting Secretary. Melbourne, Victoria; Government Printer. Pages, 140; illustrated.

Bureau des Longitudes. Annuaire pour l'An 1902. Prepared by the Bureau des Longitudes. Paris, France; Gauthier-Villars. Pages, 844. Price (in New York), 50 cents.

En. Indo-Chine. Du Sons-sol. By J.-Marc Bal; with a discussion by P. Douener. Paris, France; Societe de Geographic Commerciale. Pages, 20.

Report of the United States Commission of Fish and Fisheries, 1900. George M. Bowers, Commissioner. Washington; Government Printing Office. Pages, 570; illustrated.

What Is Chemistry? By Israel Berlin. New York; published by the Author. Pamphlet, 16 pages. Price, 10 cents.

Report on the Iron Ore Deposits Along the Kingston & Pembroke Railway in Eastern Ontario. Geological Survey of Canada. By Elfric Drew Ingall. Ottawa, Canada; Public Printer. Pages, 92; with maps. Price, 25 cents.

NEW PUBLICATIONS.

Kalendar fur Elektrochemiker Sowje Technische Chemiker und Physiker fur das Jahr 1902. Sixth annual edition. Prepared by Dr. A. Neuberger, Editor of the *Electrochemischen Zeitschrift*. Berlin, Germany; M. Krayn. Pages 555, with a supplement of 448 pages. Illustrated.

As the title suggests, this volume consists of a valuable collection of data compactly arranged for the most part in tabular form pertaining to physics, chemistry, electricity, electro-chemistry, mathematics, applied mechanics, machines and the patent laws of different countries. The book and its supplement are of convenient size for the pocket, the former being bound in flexible board covers. The condensed manner in which the great mass of detail is presented makes the work a well-filled storehouse of important facts, and while an index or table of contents would add considerably to the handiness of the work, the subject matter is so divided into sections as to render it an easy task to find information of a given kind.

This little book with its supplement has been very favorably received and will be found an excellent aid both in the laboratory and in the library.

Cyanide Practice. By Alfred James, London. E. & F. N. Spon, Limited, London. New York; the

ENGINEERING AND MINING JOURNAL, Incorporated, 1902. Pages, 174; illustrated. Price, \$5.

The great practical importance of the cyanide process of gold extraction has naturally led to the production of a special literature pertaining to it. Thus there have appeared during the still brief history of the process, the books by Scheidel, Eissler, Park and Bosqui, besides others of less prominence. None of them is an entirely satisfactory treatise upon the subject; their shortcomings may be due partly to the rapid development of the process, which has rendered it difficult for the practical worker in one particular line to become promptly conversant with the modifications introduced in other lines; and partly to the failure of the authors to take a broad view of the subject. The up-to-date and comprehensive treatise on the cyanide process that is needed by gold metallurgists is yet to be written.

It was hoped that Mr. James' "Cyanide Practice" would more fully supply what is needed. Mr. James was one of the metallurgists who early became connected with the Scotch proprietors of the MacArthur-Forrest patents, and was entrusted with the exploitation of the process in the Transvaal, where it first became a great commercial success, which success greatly facilitated its introduction in other countries, where the original expeditions sent out from Glasgow had terminated either in failure or in indifferent results. Since that time, Mr. James has had an extensive experience in South Africa, New Zealand, Australia, the United States and elsewhere, and his qualifications to write authoritatively on the cyanide process are certainly excellent. It is precisely for that reason that we are disappointed in what he has given us.

"Cyanide Practice" is by no means a treatise on the cyanide process; it is rather a series of essays upon certain applications of it. We think that this distinction was appreciated by Mr. James and that he did not intend to make it more than what it is. Thus, he states, in Chapter xiii, that American practice has been so thoroughly described by Scheidel, Janin, Leggett and Bosqui, and by articles in the mining papers, "that it is not the intention of the writer to enter into minute details, as these are already at hand and available." As a matter of fact, Mr. James does not describe American cyanide practice, which is a highly important development of the process, and only briefly refers to it. On the other hand, he treats rather fully of the practice in South Africa and Western Australia, and especially of the treatment of ore slimes. In his preface, Mr. James explains that his book is not a compilation, but is to a considerable extent a record of his personal experience and is necessarily limited by the non-inclusion of particular developments suggested or carried out by individual workers in various fields.

As a record of his personal experience, we think that Mr. James' book will be read with interest, and perhaps with profit, by all who are engaged in the application of the cyanide process, in the United States as well as in foreign countries. As a handbook, giving "sufficient information to enable the mining engineer to accurately test his products, design and erect efficient and economical plants, and work them successfully," we think it will fail to meet the requirements, at least under American conditions. In short, it is a book which we like to own, read and put in our library, but we want beside it something more. A comprehensive treatise on the cyanide process must necessarily be a compilation to a large extent, because no one man, or two or three men, has sufficient individual experience to write it from the records of his own practice, or from his own personal knowledge. We want such a compilation, however, to be prepared by a metallurgist of practical experience, who has the useful discrimination that only practical experience can give, together with that tendency to analytical consideration of a subject that enables the kernels of fact to be shelled out.

The Mineral Resources of the United States for the Calendar Year 1900; being part of the 22d Annual

Report of the United States Geological Survey. Charles D. Walcott, director; David T. Day, chief of Division of Mining and Mineral Resources, Washington; Government Printing Office, 1901. Pages, 927, board covers.

This well-known annual appears this year in smaller and more convenient size—a change that will appear favorably to all who have occasion to consult this valuable series of Government publications, as in the past, the various sections of the mineral resources of the country have been prepared by trained specialists in the different fields, and apart from the statistics of individual minerals, ores and metals collected directly from the producers, many thorough and valuable reviews are included, and in the more important sections the production in foreign countries, compiled from official sources, is also given as a basis for comparison. As in previous years, the publication of this volume has been anticipated to a great extent by the issue in advance in pamphlet form of the several chapters which compose it. These have been reviewed in the columns of the *ENGINEERING AND MINING JOURNAL* from time to time as they have appeared, and the present volume may be considered as the final place of record for this great mass of statistical matter. A summary of the mineral production of the United States for 1900 shows a continuance of the remarkable activity in the mineral industries noted in 1899, and the total value of our mineral products during the year exceeded for the first time the enormous sum of \$1,000,000,000, the exact sum being \$1,067,605,587, as compared with \$971,900,894 in 1899, a gain of \$95,704,693, or 9.85 per cent, showing by comparison with years of the past two decades that the mineral industries kept pace with the great prosperity of the nation. As heretofore, iron and coal are the most important of our mineral resources, the value of the former in 1900 being \$259,944,000 and of the latter \$306,891,364. Nearly all of the important minerals increased in output, though some showed an increase in product and a decline in value, notably copper, which increased 37,450,245 pounds, but decreased in value \$2,728,673, while zinc fell off both in output and value. The value of the fuel production increased from \$340,756,211 in 1899 to \$406,250,518 in 1900, showing a gain of \$65,494,307, or 19.2 per cent. All varieties of fuel increased except anthracite, which declined from 53,944,647 long tons in 1899 to 51,221,353 tons in 1900.

The total gain in values of the production in 1900 was \$95,704,693, of which the metallic products contributed \$24,462,127, while the non-metallic increased \$71,242,566. Lack of space precludes the discussion of each section by itself, a need which is not imperative, as practically all of the material has already appeared sectionally in pamphlet form, as mentioned above. Suffice it to give the names of those whose special training has fitted them to aid in lifting the publication to its present high position among statistical works. John Birkinbine writes on iron ores and manganese ores; James M. Swank, on iron and steel; Charles Kirchhoff, on copper, lead and zinc; Joseph Hyde Pratt, on aluminum, bauxite, antimony, asbestos, graphite, talc, soapstone, chromite, tungsten, molybdenum, uranium, vanadium and abrasives; Edward W. Parker, on coal, coke, asphaltum and bituminous rock, sulphur and pyrites, gypsum, salt, mica, fluorspar, mineral paints and barytes; F. H. Oliphant, on petroleum and natural gas; George F. Kunz, on precious stones; Jefferson Middleton, on clay products; S. J. Kübel, on lithographic stone, and A. C. Peale, on mineral waters. A summary of statistics of the mineral production of the United States is given in tabular form from 1880 to 1900, comprising the quantities and values of 61 subjects, and frequently the statistics date back many years to the very inception of the industry. Owing to the great demand for these volumes they can only be obtained by application through members of Congress.

The proper arrangement of this vast amount of statistical data reflects great credit on those who have so willingly lent their co-operation to the work, and the well arranged index places the data within easy reach.

J. S.

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.

Assay of Zinc Precipitates.

SIR:—I notice in the issue of January 21 an abstract of a paper written by Messrs. Charles H. Fulton and Charles H. Crawford for the School of Mines Quarterly, January, 1901, entitled "Assay of Zinc Precipitates." I think that it might be of interest to the *JOURNAL* readers to know the method that I have used myself with satisfactory results.

I took either 1-20 or 1-10 A. T. of the slimes, mixed them with 3 to 4 times their weight of litharge very thoroughly, and placed the mixture in a scorifier. Then I covered the mixture with 40 grams of lead and scorified in the usual manner. I never made an investigation as to the ultimate accuracy of this method, but I always checked closely with the amount of bullion in the clean tip. I give the method as a rapid and satisfactory one for obtaining good results. The action of the litharge is to oxidize the zinc before it has a chance to volatilize, thus preventing loss in that manner. The chemical reaction that takes place as near as I can judge is $2Zn + PbO_2 = 2ZnO + Pb$. This reaction takes place at a low temperature before any zinc can be volatilized.

I trust that you can make use of this information.

CHARLES S. HURTES,
Dominion Assay Office.

Vancouver, B. C., Dec. 28, 1901.

The Discovery of Platinum in Wyoming.

SIR:—In his article in the *ENGINEERING AND MINING JOURNAL*, December 28, 1901, on the above subject, Mr. W. C. Knight cannot account for the fact that platinum had not been detected in assays of ores from the Rambler Mining Company and states that he would expect platinum to be reported as gold. He also mentions that there had been trouble in adjusting assays, the difference being chiefly in the amount of silver present.

In the ordinary course of assaying, the presence of platinum being unsuspected and using nitric acid for parting, it is very easy to miss platinum, as when alloyed with other metals soluble in nitric acid, the platinum is also soluble and hence would be reported as silver. The amount of silver present in the ore is large compared with that of platinum, and hence it is probable that some, or perhaps the whole of the platinum, would be dissolved in parting with nitric acid.

Platiniferous bullion requires to be cupelled at a higher temperature than gold and silver, or, if cupelled, at a temperature sufficient for the latter metal, the resulting bead will still contain lead, which, dissolved in nitric acid, would likewise be counted as silver. By using sulphuric acid for parting, the platinum is insoluble and remains with the gold.

JAMES T. DIXON.

Mt. Sicker, Vancouver Island, B. C., Jan. 3, 1902.

Tin in Alaska.

SIR:—The United States Geological Survey, in treating of Cape Nome and the northern regions, has called the attention of the public to the discovery of tin associated with the gold in the neighborhood of Cape York, and has advised miners to look out for the source of the same as it occurred there in small round particles.

Mr. Hamman and his associates made a discovery about 12 miles distant from York of large placers of tin. These cover about 2,000 acres in extent with an average depth of about 6 feet, the material of the placers being rather weathered rock than rounded gravel. In the best parts they found an average of about 7½ per cent of tinstone in the gravel, and nowhere over the 2,000 acres did they find places that they did not think would pay to hydraulic, although

in some parts there was but little gravel on the bed-rock. An average sample of the tinstone as they washed it out, submitted to Thomas Price, of San Francisco, yielded 64.62 per cent of tin.

This deposit covers some small hills on the shore of the lagoon and extends back into the country about three miles. The lagoon is too shallow for steamers to enter, but affords a good harbor for lighters to load steamers which lie outside. There are about 5,000 miner's inches of water that can be obtained at a small expense to hydraulic this ground. For four months in the year it can be worked day and night.

Parties have obtained an option on this property to examine it the coming season, and if found satisfactory in quantity, will proceed to develop it. There is some little gold mixed with the tin, but the prospectors were not able to make this pay.

Detroit, Mich., Jan. 9, 1902.

W. M. COURTIS.

The Origin of the Fine Gold of Snake River.

SIR:—The origin of the fine gold of Snake River has been a subject of much speculation for years, and has entirely baffled the theories and researches of the ordinary prospector, who has traced it from the mouth of the river to its very source, only to find, contrary to the experience of almost all other placer fields, that the same uniform fineness and filmy conditions of the delicate colors prevail throughout.

One of the most plausible theories that have been suggested touching the origin of this extensive distribution of the precious metal was advanced by Capt. N. L. Turner, a West Point man, who spent considerable time investigating the problem in the early eighties. Capt. Turner advanced the theory that the gold was originally held in solution by the waters of a great inland sea or lake that occupied the Snake River Valley subsequent to the Miocene period and that the gradual and repeated evaporation of this great body of water by subsequent lava flows resulted in the precipitation of its metallic contents, generally and evenly over its basin area. This theory would seem to account for the uniform size and quality of the golden colors so generally disseminated throughout the enormous acreage of fine gravel beds through which the Snake River now courses.

The geological record of the rocks left along the borders of this stream, and in the Grand Cañon below Weiser, offer conclusive evidence of a land-locked body of water that covered the whole valley and that probably exceeded Lake Bonneville in depth and areal extent at some of its higher levels. This great body of water, which might aptly be called Lake Idaho, for the purpose of this article, was created by the closing of the lower valley by a great dam of brown Columbia lava 6,500 feet high, now plainly exposed by erosion. Its highest level is indicated by a stretch of conformable shoreline conglomerate gravel, along the west side of Wood River, near Hailey, at an altitude of 6,000 feet. At this level the waters of Lake Idaho must have extended along the present course of the valley from below Weiser to the foot of the main range, and covered a distance of fully 500 miles in length by 150 miles in breadth and over 4,000 feet deep at its deepest point.

This lake suffered numerous and extensive variations of level during the later Tertiary periods. Some of the more recent horizons are still exposed at Pocatello, where on either side of the Portneuf Estuary, in plain sight from the depot, well defined benches or terraces of shore-line gravel are left exposed 100 feet high above the town; and a succession of low step terraces of lake shore gravel, cut by the main track of the Oregon Short Line Railway between Pocatello and American Falls, plainly indicate the rapid recession of the lake levels of this period, and its final drainage and complete obliteration by the erosion of the Snake River channel to its present level.

These varying lake levels are well established

throughout the valley within a vertical range of 4,000 feet, and are now represented by the beds of conglomerate gravel alternating with great flows of black basaltic lava of more recent date. Most of these conglomerate deposits are gold bearing, and their sub-aerial disintegration and erosion by recent stream action is doubtless responsible for the immediate source of the fine float colors, now so generally distributed through the loose gravel and silt of the present river channel and its wide flat bars.

Prior to the inception of the great floods of black lava that have filled the upper valley, the shore lines and basin area of Lake Idaho were almost all composed of granite and Palaeozoic formations. These formations were rich in placer and quartz gold, as proven by the higher slopes of the present drainage basin, and by the number of island summits of those formations that have been left exposed above the sombre lava floods. The chemical reactions set up by this combination of conditions and events would readily account for the aqueous origin of the gold, and it seems to me altogether probable that Capt. Turner's theory is correct.

The quality of Snake River gold is high and when properly cleaned mints for \$19.35 per ounce. The colors are not only fine, running from 1,000 to 2,000 to the cent in value, but they are also flakey in shape, and are washed down stream with every summer flood enriching the low shifting bars at every short bend in the stream where a favorable condition for their concentration is presented. Bedrock is not important to the deposition of the values. In the high banks of loose gravel that border the stream, as well as in the low bars and flood planes, the richest values are represented by thin lines of gray silt or calcareous sediment. These lines of enrichment represent flood periods. They are usually from a few inches to 1 foot or more in thickness, and 1 foot to 10 feet apart. The intervening space all carries gold, but much more sparingly.

Subjected to microscopic examination many of the colors show rounded edges and a concave or cup-shaped depression in their flat surface, and quite a proportion of them are coated with a sugary incrustation of silica or some other substance, which involves the necessity of scouring them in a clean-up barrel or an arrastra pan before they will unite freely with mercury. Under a sharp focus of the microscope all the colors show a delicate lace, like tracery of fine brown lines, that suggest chemical reaction. The particles were probably precipitated from their original watery solution as chloride or bromide of gold and afterward transmuted to metallic by natural process.

Aside from the above characteristics, under a powerful glass the fine particles reveal the natural yellow color and worn, knotted appearance of high grade gold nuggets. The only natural alloy that the Government assay office at Boise, Idaho, accounts for on shipments of Snake River bullion is a small amount of silver, and as the fineness of the bullion after deducting the silver does not exceed 950 there still remains considerable room for other natural alloys, which it is not unlikely may be in part made up by platinum or iridium. In fact, a gray white metal in impalpably fine particles, but just as readily separated as the gold in panning, has been noticed at several points along Snake River. This is supposed to be one or the other of the rare metals above mentioned.

A series of analyses of concentrates and bullion from different points along the stream are being made by the writer at the present time and should they prove to contain an appreciable amount of either platinum or iridium, the fact will lend an added interest and incentive to the recovery of Snake River fine gold.

An absolutely reliable method of saving the gold and the other natural advantage of fine climate, railroad transportation, cheap labor, power and ground, are inducements that should make this an attractive field for investigation and investment.

ROBERT BELL.

Blackfoot, Idaho, Dec. 30, 1901.

QUESTIONS AND ANSWERS

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert, or can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preferences will, of course, always be given to questions submitted by subscribers. Books referred to in this column can be obtained from the Book Department of the ENGINEERING AND MINING JOURNAL).

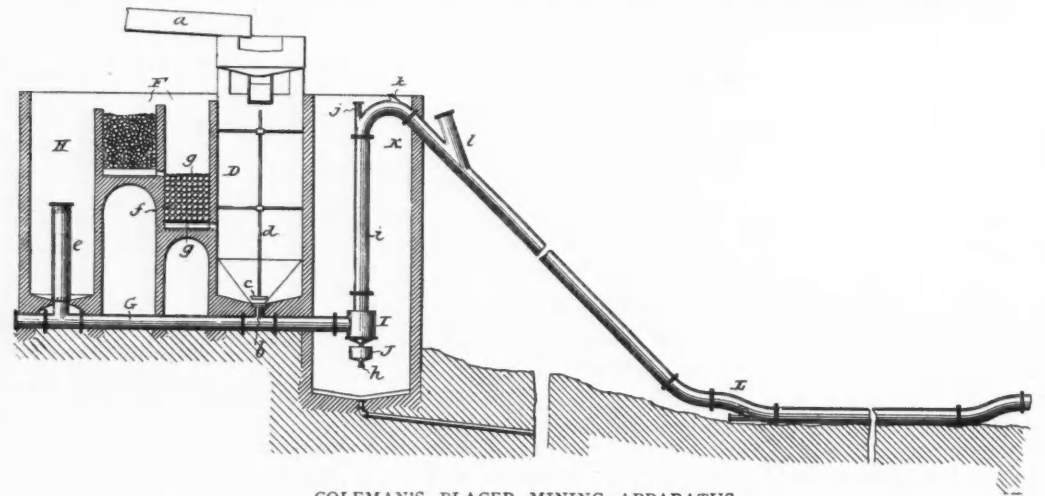
Iron from Pyrites.—Will the iron residue from pyrites, after the sulphur is driven off by roasting or burning, be magnetic?—W. G.

Answer.—Iron pyrites becomes magnetic when partially or entirely desulphurized. It can be separated in one of the forms of magnetic concentration.

The Oil Concentrating Process.—Will you kindly describe the "oil concentrating process" for the benefit of your readers?—X. W.

Answer.—The Elmore concentrating process, in which oil is used to aid in separating certain minerals, was described and illustrated in the ENGINEERING AND MINING JOURNAL, June 1, 1901, page 691.

"Making" Gold.—Have you any book which describes the making of gold in a laboratory? I understand gold has been produced by the combining of certain elements, under certain heat, for certain length of time, by some metallurgical chemists in



COLEMAN'S PLACER MINING APPARATUS.

their laboratories, although proving a high cost article to make.—F. H. N.

Answer.—We cannot refer you to any book on the "making" of gold, as the writings of the old alchemists are long out of print, and Dr. S. H. Emmens, the latest operator in this line, has not given his experiences to the world, and his present address is unknown. You are certainly misinformed as to the production of gold by the "combining of certain elements." To "make" gold has been a dream which has induced men to work at all sorts of experiments for centuries past; but no one has ever succeeded in doing it.

The Frasch Nickel Process.—I have seen frequent references in your JOURNAL to the Frasch Process of reducing copper and nickel ores, and have frequent inquiries, in a professional way, from investors, relating to this process. I would be glad to learn whatever is to be learned concerning the same. From my present information I am led to believe that there is very little covered by the Frasch patents that has not been known for years to expert metallurgists.—A. L. R.

Answer.—A full account of the Frasch patents for the recovery of nickel was given in the ENGINEERING AND MINING JOURNAL, April 6, 1901, page 428. From that account you can see just what the claims of those patents cover, and how much novelty there is in the process. The introduction of the process on a commercial scale has been delayed, we understand,

by difficulties among the stockholders of the company which undertook to build works for that purpose.

THE COLEMAN MINING PROCESS.

The accompanying illustration is a working representation of a machine recently patented by Mr. John E. Coleman, of New York City, for the economical working of placer ground containing platinum, gold and black sand. It is claimed that with this method a much greater saving, particularly of the fine or float gold, can be obtained than by the ordinary methods of sluicing and amalgamation. It is also claimed to be especially adapted to the successful working of tailings. One of the particular advantages also claimed for the machine over other processes is the rapidity and cheapness with which the material is handled, the cost being only from 1 to 5 cents per cubic yard. After the apparatus is set up and ready for use, the inventor claims that the expense practically ceases, as it depends for its operation on nothing more than the principle of the syphon; no steam nor electricity for power being necessary. All it needs is a fall in the ground, and to have water for its operation. Water can be transported over the roughest kind of country and to any distance provided that the machine is at a lower point than the source of the water supply. The machine is made interchangeable, and in small parts, so that it can be readily transported over rough trails.

In the operation of this process the material is received into the chamber D, passing from there upwards through g, in which are placed copper balls coated with quicksilver. After passing through the copper balls, the material, which is still held in suspension, passes through F into the chamber H, from which it is carried to the pipes e and G to I, and from I is syphoned out. Below the bottom of the pipe at I is a cup for the receiving of such material as might still settle out of the water at this stage of the process. It will be seen from this description that the main feature of the process is that the water carrying the platinum, gold and other valuables is carried downward and made to deposit the precious metals in receivers at bottom rather than by the old method of precipitation from a running stream, thus following the laws of gravity in getting the deposit to the low point and then retaining the values.

On placers where there is no water a supply can be obtained sufficient to load the plant and be used over and over again, none being lost except by evaporation and the loss in moisture on the dump. Mr. Coleman states that he will equip any good placer mine in the United States with his machine, taking an interest in the property for the cost of the plant.

The system is reported to have been commercially and successfully demonstrated on a large scale on a mining property, and Mr. Coleman is now installing a plant capable of handling 500 cubic yards of gravel per hour at Weaverville, Trinity County, California, for a syndicate of Philadelphia, Pa., capitalists.

SAVING FINE GOLD FROM SAND.

An appliance has been perfected in San Francisco for the reclamation of fine gold values contained in deposits of auriferous sands, such as are found upon ocean beaches as well as in beds and upon the bars of rivers and streams. The process is the invention of F. M. Johnson of San Francisco and has been purchased by the Rose Gold Reclamation Company for the purpose of operating it and placing it upon the market in this and foreign countries. They claim that the appliance is inexpensive in construction and operation and does its work effectively, and that it is the application of a simple principle. They assert that it not only saves the gold, but the platinum as well, and does it at no increased cost.

The exterior of the appliance is an ordinary sluice-box, built of 1-in. boards, 12 feet in length, 12 inches in width and 5 inches in depth. The interior (patents applied for) is a matter of arrangement rather than of material, the latter costing not to exceed \$1.50 per box. Neither plates, mercury nor magnets are used. The owners state that two or three tons of sand per hour were run through one of these appliances day after day, consecutively, during a trial test of about thirty days upon the beach sands at Aptos, near Santa Cruz, Cal., and that all of the gold and platinum carried by the sands were reclaimed and saved, and that the gold saved in this test run averaged 400 colors of gold to the cent in value. They also state that in addition there have been numerous tests of sands from Nome, the Snake and Columbia rivers, of the beach sands upon the California, Oregon and Washington coasts, as well as those from the Colorado River.

These boxes may be placed in batteries of five, ten, twenty or more, up to any number desired, and the sand and water may be fed by hand or with mechanical appliances, and the boxes may also be used as an adjunct to ordinary sluicing or hydraulicking operations, with the result of saving the values in fine gold contained in the sand concentrates which are otherwise lost.

MINERAL EXPORTS OF BORNEO.—According to the British consul at Sarawak, the exports of gold from Borneo in 1900 amounted to \$410,544; those of coal to 15,080 tons, and antimony to 85 tons. As compared with the previous year, the exports of gold showed an increase of \$146,948.

PATENTS RELATING TO MINING AND METALLURGY
UNITED STATES.

The following is a list of patents relating to mining and 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 ENGINEERING AND MINING JOURNAL upon receipt of 25 cents.

Week Ending January 7, 1902.

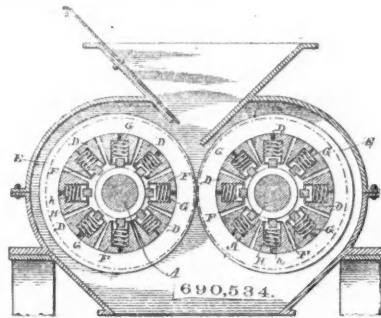
690,486. **APPARATUS FOR THE VAPORIZATION, COMBUSTION, AND UTILIZATION OF HYDROCARBON OILS.**—Thomas Tomlinson, Bray, Ireland. The combination of means for mixing oil with air, means for igniting this mixture, means for causing the products of combustion thereof to mix with a further supply of air, means for causing this last-mentioned mixture to vaporize a further supply of oil, and means for combining a further supply of air therewith.

690,502. **METHOD OF MAKING HYDROGEN SULPHIDE.**—Herbert H. Wing, Buffalo, N. Y. A process of obtaining sulphureted-hydrogen gas and a by-product which consists in bringing a solution containing available sulphurous acid into contact with a carbonate of any of the alkaline-earth metals, whereby such carbonate is converted into sulphite, and carbonic-acid gas is given off; collecting the carbonic-acid gas; passing such carbonic-acid gas into contact with a sulphide of one of said metals in the presence of water, whereby a concentrated sulphureted-hydrogen gas is evolved and said sulphide is converted into a carbonate; and collecting said sulphureted-hydrogen gas.

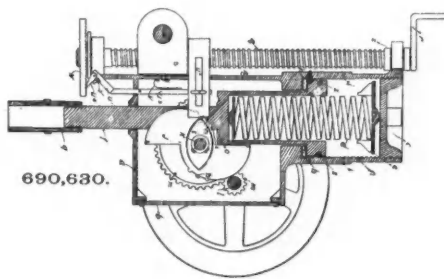
690,503. **PROCESS OF MAKING MAGNESIUM SULPHITE.**—Herbert H. Wing, New Brighton, N. Y. A process of producing magnesium sulphite and a by-product which consists in subjecting any compound of magnesium decomposable by sulphur dioxide in the presence of moisture, to the action of fumes containing sulphur dioxide and air, whereby the sulphite and sulphate of magnesium are produced, then separating the insoluble magnesium sulphite from the liquor in which it was produced, and then crystallizing the magnesium sulphate from said liquor.

690,518. **CONVEYER.**—Arthur J. Frith, New York, N. Y. The combination, in a conveyer, of traveling buckets; a bucket-loader; means for operating said loader to load material into the buckets; a conveying device for supplying material to said loader; and mechanism for driving said conveying device.

690,520. **PROCESS OF OBTAINING METALLIC LEAD FROM LEAD ORES.**—Antonin Germot, Asnieres, France. A process of treatment of lead ores for obtaining metallic lead therefrom consisting in blowing air through a mass of molten galena, preventing any access of air to the fumes of sulphide of lead which separate from the mass and collecting the said fumes of sulphide of lead.

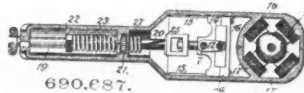


690,534. **CRUSHING-MILL.**—Thomas L. Sturtevant, Quincy, and Thomas J. Sturtevant, Newton Center, Mass. A centrifugal crushing-roll comprising the combination with a circular series of centrifugal weights, of a loose tire encircling said weights, and springs for yieldingly forcing said weights outward against the inner face of said tire, and thereby serving, in co-operation with said tire, to normally hold said weights concentric with the shaft of the roll when the latter is at rest as well as when it is in rotation.



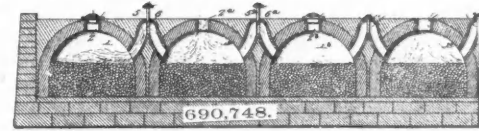
690,630. **ROCK-DRILL.**—Arthur C. Bates, San Francisco, Cal. In a rock-drill machine-casing having a forward and rear chamber, said forward chamber inclosing parts of its mechanism and said rear chamber being provided with vents for admitting air therein, a plunger provided with a recess for inclosing a spring to drive it forward and having a flange or head at the mouth of said recess adapted to fit closely against the walls of said rear chamber so as to permit of the formation of a cushion of compressed air between said flange or head and the forward inclosed part of said rear chamber surrounding the recessed portion of said plunger slidable therein, in combination with a cam-wheel having two parts for successively forcing back said plunger and compressing said spring and suddenly releasing the same, and having spurs on the rim thereof to act in conjunction with pockets in said plunger opposite thereto for twisting the same, a cam adapted consecutively to act upon and release a feed attachment provided with a pawl arranged to engage the teeth of a ratchet-wheel attached to a feed-screw for the forward movement of the machine.

690,676. **TUBING-PROTECTOR FOR OIL WELLS.**—George F. Tait, McDonald, Pa. The combination of tubing, cylindrical casings surrounding the lower end of said tubing, a spring arranged in the upper end of said casing, a sleeve arranged upon said spring, a buffer-spring in the lower end of said casing, and washers arranged on the upper end of said spring.

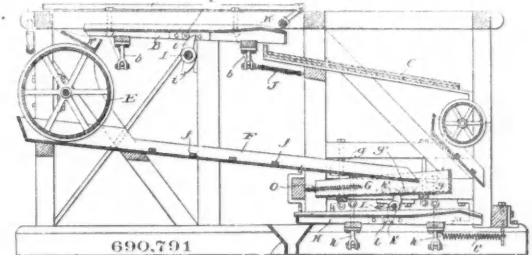


690,687. **ROCK-DRILL.**—Alvin M. Ballou, Denver, Colo. In an electromechanical rock-drill, the combination of a driving-wheel, having holes, a disk provided with loose tapered keys and with springs holding said keys in said holes, and a shaft, upon which said wheel is loose and upon which said disk is mounted with friction-rolls for permitting rotation in one direction and not in the other, a motor for driving said wheel, a crank on said shaft, and a plunger for holding a bit connected up with said crank against the resistance of spring.

690,748. **COKE-OVEN.**—Richard D. Martin, Alderson, Ind. Ter. Adjoining coke-ovens separated by an intervening wall having a V-shaped passage leading directly from one oven to the other through the outer part of the masonry, in combination with means for opening and closing said passage.



690,791. **GOLD SEPARATING MACHINE.**—Benjamin W. Sweet, Denver, Colo., assignor to J. Platt Underwood, Chicago, Ill. The combination with an inclined concentrating-table, and means for operating the same, of amalgamating-surfaces at each end of said table for receiving the heavier and lighter grades respectively, a lower inclined concentra-



ting-table, sizing-screens located above said lower table for separating out the heavier grades and discharging the lighter concentrates with a fall sufficient to submerge them on the lower table, means for operating the lower table and the screens, and means for discharging the material passing from the amalgamating-surface which treats the lighter grades into the sizing-screens.

690,795. **APPARATUS FOR COOLING AND CLEANSING BLAST-FURNACE GASES.**—Benjamin H. Thwaite, Westminster, England, assignor to the Blast Furnace Power Syndicate, Limited, London and Westminster, England. An apparatus for cooling and cleansing blast-furnace gases, comprising a vessel placed over a water-trough and having a suitable inlet and outlet for the gases, partitions in said casing provided with openings for the passage of the gases therethrough, an upper compartment in the said vessel having a suitable air inlet and outlet and divided into subsidiary compartments, tubes depending from each of said subsidiary compartments to the water and provided with closed buttons, and a tube extending in each of the said depending tubes having an open bottom and connected at the top to one of the subsidiary compartments.

690,813. **HYDRAULIC MOTOR OR PUMP AND REVERSING-VALVE THEREFOR.**—William O. Worth, Chicago, Ill., assignor of two-thirds to William R. Donaldson, Louisville, Ky., and Henry W. Kellogg, Battle Creek, Mich. The combination of a working chamber, a rotatable piston therein, fluid-chambers on opposite sides of said working chamber, each having an inlet and an outlet, and means whereby the inlet of either chamber and the outlet of the other chamber can be opened at will, while the inlet of the latter chamber and outlet of the former chamber are closed, for the purpose of reversing the rotation of the piston.

690,888. **MANUFACTURE OF ARTIFICIAL FUEL.**—Ehrich Springborn, London, England. A method of treating carbonaceous substance for the production of fuel, consisting in first impregnating such substance with sugar, then immersing it in hydrocarbon liquor, then adding to said liquor while the substance is immersed therein a solution of alkali, and finally allowing it to dry.

GREAT BRITAIN.

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

Week Ending December 14, 1901.

21,388 of 1900. **ROASTING FURNACE.** R. Davey, Pertusola, Italy. A roasting furnace with movable bottom, so making it possible to adjust temperatures.

23,271 of 1900. **MINERS' LAMP LOCK.**—J. Prestwich, Manchester. Improvements in locking miners' safety lamps, while allowing inspection of certain parts.

510 of 1901. **TUYERE.**—W. J. Foster, Darlaston. Tuyeres for furnaces cooled by air current, which when heated is used in the furnace.

754 of 1901. **ZINC PEROXIDE MAKING.**—R. Wolfenstein, Berlin, Germany. Making zinc and other peroxides by acting on a salt of the metal with an alkaline solution of hydrogen peroxide.

21,097 of 1901. **SULPHIDE ORE TREATMENT.**—C. Rogers and A. M. Oswald, Melbourne, Australia. Treating complex sulphides by alternate roasting and lixiviation, so obtaining zinc sulphate in solution and leaving the lead behind free from sulphur.

PERSONAL.

Mr. James W. Neill, of Salt Lake, Utah, has been in Butte, Mon.

Mr. L. Y. Keady, mine promoter, of Portland, Ore., is on a trip to Kansas City and Chicago.

Mr. John B. Farish, of Denver, Colo., has been in New York City on professional business.

Mr. G. A. Duncan, of Salt Lake, Utah, is in Arizona with Boston parties examining copper properties.

Mr. W. H. Tibbals, of Salt Lake, Utah, recently examined mining property in Boulder County, Colo.

Mr. James Lindsey, mining engineer, of Portland, Ore., has been at Duluth, Minn., on a professional trip.

Mr. Edwin E. Chase, mining engineer, of Denver, Colo., is at present in Mexico on professional business.

Mr. L. A. Dunham is now superintendent of the Clifton Consolidated Copper Company, at Clifton, Ariz.

Mr. W. Woods, of the Tucker Mine at Central City, Colo., after a business trip to Chicago, has returned home.

Mr. Louis Janin, Jr., is now consulting engineer for the Chainman Mining and Electric Company, Ely, Nevada.

Mr. John A. Kirby has succeeded Mr. John Keetly as superintendent of the Little Bell Mining Company at Park City, Utah.

Mr. Robert J. Coleman, of Salt Lake, Utah, manager of the Boston Consolidated Company at Bingham, is in Mexico.

Mr. Reuben C. Hallett has accepted a position with the Chicago Pneumatic Tool Company's Eastern sales department.

Mr. Carr B. Neel, of Chicago, Ill., has gone to Encampment, Wyo., where he will take charge of a mining proposition.

Mr. Gill S. Peyton, of Salt Lake, Utah, expects to make permanent headquarters in New York City for his Utah interests.

Mr. J. T. Breckon, of Breckon, Dick & Faison, Salt Lake, Utah, is making a survey of the Sunshine Mines, Mercur District, Utah.

Mr. H. W. Turner, mining engineer of San Francisco, Cal., is examining gold mining properties in Esmeralda County, Nev.

Mr. E. C. Loftus has been appointed superintendent of the App Mine, Quartz Mountain, Cal., succeeding Mr. W. Moorehead, resigned.

Mr. A. F. Holden, managing director of the United States Mining Company, expects to remain in Utah the greater part of the next two months.

Mr. C. M. Baldwin, of Chicago, Ill., has returned to Gilpin County, Colo., to look after the operation of the National Tunnel and Mining Company.

Mr. Wm. S. Graham, civil and mining engineer and county surveyor of Auburn, Cal., has been confirmed United States Surveyor General for California.

Mr. C. S. Hazelwood, of Chicago, Ill., recently visited Central City, in Gilpin County, Colo., being interested in the West Notaway Mining Company.

Mr. A. J. Davis, manager of the San Rafael Oil Company, of Salt Lake, Utah, is on a trip through the Eastern States in the interest of his company.

Mr. A. B. Hall, who has for several months been at the Reward Mine in Inyo County, Cal., has taken charge of a mining property near Hot Springs Junction, Ariz.

Mr. H. G. Murray, formerly with the Gwin Mine, near Mokelumne Hill, Cal., who has been several years in Korea, is in San Francisco. He expects to return to Korea.

Mr. L. S. Austin, superintendent of the Sullivan Group Mining Company, of Marysville, B. C., is at present in Denver, Colo., purchasing machinery for a smelter to be built by his company.

Mr. Frank C. Loring, mining engineer, of New York City, is at present in Spain on professional business. His address is Hotel Roma, Malaga, Spain. He expects to remain abroad some time.

Major A. W. Horton, formerly manager of the Youghiogheny & Lehigh Coal Company, at Superior, Wis., has been appointed general western agent at Chicago of the Pittsburg Coal Company.

Col. J. A. Fleming, president of the Black Warrior Company, Amalgamated, at Black Warrior, Ariz., has been at that place from New York giving personal attention to the completion of acid works.

Mr. Clarence K. Colvin has resigned as manager of the Boston & Denver Consolidated Mining and Milling Company, of Gilpin County, Colo., and has resumed his profession of mining engineer at Denver, Colo.

Mr. A. L. Hammerberg, of the Tennessee Coal, Iron and Railroad Company, of Ensley, Ala., has been appointed chief mechanical engineer of the Youngs-

town Iron, Sheet and Tube Company, of Youngstown, Ohio.

Mr. Austin H. Brown, general manager of Captain De La Mar's Bully Hill copper mines in Shasta County, Cal., has accepted the position of general manager of the Trinity Copper Company in the same county.

Mr. C. A. Laisant, ex-member of the French Chamber of Deputies is in this country to investigate the oil fields of Pennsylvania, Ohio and West Virginia in behalf of French capitalists who want to invest in oil properties.

Mr. H. A. Reyer has severed his connection with the Crucible Steel Company of America, at Denver, Colo., and will take charge of the Denver branch of the Colonial Steel Company, at 203 Quincy Building, Denver, Colo.

Mr. W. B. Moore has resigned as foreman at the La Mina Veta Grande Mine of the Cananea Consolidated Copper Company, at La Cananea, Mex., to accept a similar position at Santa Rosalia, Sonora, Mexico, with the Santa Rosalia Mine.

Col. O. P. Posey, general manager; Mr. Duncan McVickie, consulting engineer, and Mr. Clarence K. McCornick, a director in the Bingham Consolidated Company, of Utah, were in Boston, Mass., recently attending the meeting of the company.

Mr. S. E. Bretherton, formerly of Silver City, N. M., and lately of Denver, has accepted the position of superintendent and metallurgist of the Rocky Mountain Smelting Company at Florence, Colo., and now has the company's plant in successful operation.

Mr. W. A. Heywood has resigned his position with the Mond Nickel Company, at Victoria Mines, Ont., to accept the position of superintendent of smelting for the Tennessee Copper Company, and has removed to their works at Copperhill, Polk County, Tenn.

Dr. Antonio Jose Cadivid, private secretary of President Marroquin, of Colombia, and General Manuel Maria Mallarino, ex-Minister of War, are in New York City from Panama, staying at the Hotel America. Their mission is to dispose of the government emerald mines at Muza, Department of Boyaca.

Mr. Willis McCornick, of Salt Lake, Utah, who has been superintending work at the alluvial deposits of the Siberian Exploration Company, in the Achinsk District about 300 miles southeast of Tomsk, has ordered of the Risdon Iron Works, of San Francisco, Cal., 2 hydraulic elevators capable of handling 75 cu. yd. per hour and 2 6-in. giants, which will be shipped to New York City and thence via Copenhagen to Libau.

SOCIETIES AND TECHNICAL SCHOOLS.

CIVIL ENGINEERS SOCIETY OF ST. PAUL.—The annual meeting was held January 13, with President Powell in the chair. After the reports of officers for the past year had been read and approved the annual election of officers for the coming year resulted as follows: President, A. W. Munster; vice-president, A. R. Starkey; secretary, G. S. Edmonstone; treasurer, A. H. Hoagland; librarian, C. A. Winslow; representative board of managers, Association of Engineering Societies, George L. Wilson. Mr. L. P. Wolfe was elected a member of the society.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—At the 49th annual meeting of the society, January 18, in New York City, about 400 members were present. The annual report of the society showed that there was an increase of membership of 191 in the last year.

John F. O'Rourke described his work on the foundations of the new Stock Exchange Building and the new Hanover Bank Building. William Barclay Parsons, chief engineer of the Rapid Transit Commission, also described the work on the tunnel. The society inspected both the tunnel and the foundations of the buildings of which Mr. O'Rourke spoke.

At a business meeting the following officers were elected: President, Robert Moore, of St. Louis; vice-presidents, John R. Freeman, of Providence and Chas. C. Schneider, of New York; treasurer, Joseph M. Knapp, of New York; directors, R. S. Buck, George H. Peagram, Wm. J. Wilgus, Wm. Jackson, Edmund F. Van Hoesen and James L. Frazier.

AMERICAN CHEMICAL SOCIETY.—At the recent meeting in Philadelphia, the following officers were elected: President, Dr. Ira Remsen, of Johns Hopkins University, Baltimore; members of the council to serve 3 years: Dr. A. A. Noyes, of the Massachusetts Institute of Technology, Boston; C. F. McKenna, of New York, and Dr. T. M. Drown, president of Lehigh University. Among the various points of interest visited were the Baldwin Locomotive Works, the new United States Mint, Cramps' Shipyard, the United Gas Company's plant at Point Breeze, the Midvale Steel Works, Girard College, Wetherell Bros. white lead works and the League Island Navy Yard.

The council of the society made the following elections: Secretary, Dr. Albert C. Hale, of Brooklyn; treasurer, Albert P. Hallock, of New York; librarian,

E. G. Love, of New York; editor, Dr. W. A. Noyes, of Terre Haute, Ind.; directors, to serve 3 years: E. E. Smith and Dr. C. F. Chandler, both of New York. Committee on Papers and Publications: W. A. Noyes, editor; W. F. Hillebrand, Washington; J. H. Long, Chicago; William McMurtrie, New York; A. A. Noyes, Boston; Edward Hart, Easton, Pa.; Dr. Edgar F. Smith, Philadelphia; H. N. Stokes, Washington; H. P. Talbot, Boston; H. W. Wiley, Washington.

INDUSTRIAL NOTES.

The Trenton Iron Company, of Trenton, N. J., has purchased much machinery for the manufacture of wire rope.

The Burt Manufacturing Company, of Akron, O., recently secured a contract for large oil filtering equipments from Smyrna, Turkey.

The Mine and Smelter Supply Company, of Salt Lake, Utah, has an order from the Copperopolis Mining Company, of Sumpter, Ore., for 3 Durkee electric drills.

The Colorado Iron Works, of Denver, Colo., has received an order for 8 25 cu. ft. capacity screw dump slag trucks for the American Smelting and Refining Company, at Perth Amboy, N. J.

The McNamara-Frame Company, mining engineers, of Portland, Ore., has been dissolved, George Gordon McNamara continuing the business from the office in the Failing Block, that city.

The Electric Furnace Company, of 52 William Street, New York City, which is erecting an 8,000-h. p. hydraulic electric power station at Elizabethtown, Tenn., is purchasing turbines, generators and transformers.

The British Westinghouse Electric and Manufacturing Company's new Manchester, Eng., plant is to be equipped with a Roney mechanical stoking outfit. Equipments sufficient to feed 1,500 h. p. have already been ordered.

The Great Northern Manufacturing and Supply Company, of Terre Haute, Ind., which was organized about 3 years ago and has done a considerable business in furnishing supplies for the miners in the Indiana coal mines, has filed an assignment.

The Ingersoll-Sergeant Drill Company, through its New York City office, has shipped a car-load of machinery to the Daly-Judge Mine, Park City, Utah. Included in the consignment were a Class A compressor, machine drills and several hundred feet of pipe.

The Grant & Williams Company, of New York City, dealers in steam shovels, hoisting engines and contractors' plants, states that it has about finished tearing down the large self-supporting 100-ton derrick erected at the Fall River Line docks at Fall River, Mass., about 40 years ago.

The Central Coal and Coke Company, of Kansas City, recently purchased a 2-unit coal mining plant for its Rock Springs, Wyo., mines, from the Morgan-Gardner Electric Company, of Chicago. Included in the equipment of the plant is a standard "D" machine, a 100 kw. generator, haulage motor and drills.

Fairbanks, Morse & Company are shipping from their Salt Lake branch a 60 h. p. gasoline hoist, to the Utah & Eastern Copper Company, of Dixie, Utah, also a 100 h. p. steam hoist to the Honorine Mining Company, at Stockton, Utah, and a similar hoist to the Little Bell Mining Company, at Park City, Utah.

The National Salt Company is removing its sales department, which has been in the Standard Oil Building, New York City, to Scranton, Pa., where the headquarters of the International Salt Company and the Retsof Mining Company are located. A. S. White, chairman of the board of International Salt directors, will retain his present offices in New York.

P. H. Patriarche, formerly with the Crescent Steel Company, and Park E. Bell, with the Park Steel Company, have formed a partnership for continuing in the steel business on their own account under the firm name of Patriarche & Bell. They have secured a warehouse at 215 Pearl street, New York City, where they propose carrying a stock of all grades and sizes of steel most in demand.

Diedrichs & Burke, machinery contractors of Salt Lake, Utah, have started work on the Coconino Copper Company's mill near the Utah-Arizona line in Coconino County, Ariz. The contract calls for the erection of a 100-ton mill for Neill's copper leaching process. These contractors will also install three 150-h. p. return tubular boilers on the Honorine Mine at Stockton, Utah.

The Capital City Brick Company, capital \$150,000, incorporated under the laws of West Virginia, to control the output of building brick in Central Ohio, has secured control of 11 of the 14 plants. The combined annual output will reach nearly 50,000,000 bricks. The officers are: President and general manager, W. H. Fish; vice-president, J. G. Drayer; secretary-treasurer and superintendent, C. F. Harrison.

The Allentown, Pa., blast furnaces owned by the Lehigh Coal and Navigation Company, of Philadelphia, have been leased to the Empire Steel and Iron Company for a term of years. One of the furnaces will probably be in blast in March. A. T. Clymer will continue manager.

The Empire Company is about to blow in its furnace at Macungie. This, with Allentown, will make 10 active furnaces owned or controlled by the Empire Steel and Iron Company.

G. E. Alexander, metallurgical engineer of Denver, Colo., has lately equipped an ore testing plant in that city. Among the concentrating tables used are the Wilfley, the new Standard and the Dimmick, and there are cyanide tanks, sodium hyposulphite leaching vats, chlorination barrel, magnetic separator, etc. A Bruckner roaster also forms part of the plant. The chemical laboratory is fully equipped. Mr. Alexander has spent over 10 years at ore testing and was for many years in the laboratory of the Kansas City Smelter.

The International Steam Pump Company of New York City has purchased 33 acres of ground at Harrison, N. J., where, report says, it will erect the largest and best equipped pump plant in the world. Plans for the buildings are being prepared. The company will consolidate there the Henry R. Worthington plants at Brooklyn, N. Y., and Elizabethport, N. J. Extensive improvements are being made at the Blake-Knowles plant, at East Cambridge, Mass.; the Deane works, at Holyoke; the Snow plant, at Buffalo, and the Laidlaw-Dunn-Gordon works, at Cincinnati. It is stated that the company has acquired control of the Clayton Air Compressor Company of New York City.

Work on the \$500,000 gas plant in Monterey, Mex., the concession for which has been secured by the Loomis-Pettibone Company, of 52 Broadway, New York City, will start within 2 months and is expected to be completed by September. R. N. Oakman, the chief engineer of the company, has returned from Mexico to arrange final details for the construction of the plant. Everything in the way of equipment will be purchased in the United States. An initial plant is to be installed having a capacity of 2,000 h. p. The capacity will be increased later on to 5,000 h. p. capacity; about 5 miles of piping will be required. The gas engines will be connected with electric generators.

The Lloyd Manufacturing Company, of Pittsburg, Pa., has increased its capital stock to \$75,000. Mr. Lloyd and Mr. Doneho, James F. Richards, Charles E. Wolfendale, of Allegheny, and Stephen Neuburn, of Bellevue, were made directors. The company's specialty will be a coal-digging machine. Most of the stockholders were interested in the Bolen & Fritz Manufacturing Company, incorporated under the laws of Illinois, but that company did not succeed for various reasons, and Joseph Bolen and George Fritz, the inventors of the machine, were bought out by the others and the new company is the result.

The old machine weighed 3,400 lbs. and was too heavy for 2 men to handle. A new machine has been constructed that weighs but 2,800 lbs. The machine is designed to cut in to or under a vein of coal and the coal above is broken down by explosives or other means.

The Chicago Pneumatic Tool Company has acquired 2 additional plants, viz.; The Chisholm & Moore Manufacturing Company (pneumatic cranes and hoists), and the New York-Franklin Air Compressor Company (air compressors). The crane department is running full time on orders in hand, and from the number of inquiries received since January 1, the company states that the outlook is that the plant will shortly be working double shift. The compressor department has orders to keep a full force of workmen employed for some time. Among recent orders received, may be mentioned one for 7 500-ft. air compressors from the Lehigh Valley Railroad Company.

The company's executive board has announced the following appointments: W. O. Duntley, vice-president and general manager; C. E. Walker, assistant general manager; Thomas Aldcorn, general sales agent; W. P. Pressinger, general manager air compressor department; Chas. Booth, manager Chicago office; S. G. Allen, manager New York office.

TRADE CATALOGUES.

The Lufkin Rule Company, of Saginaw, Mich., is sending out printed matter calling attention to its steel tapes.

A little 15-page pamphlet sent out by the Hardy Motor Works, Limited, of Port Huron, Mich., describes the 1 1-4 h. p. "Har De" motor, a gas or gasoline engine.

A descriptive article that recently appeared in several numbers of the *Electrical World and Engineer* on "The Inductor Alternator," is reprinted as Bulletin No. 123 of the Stanley Electric Manufacturing Company, of Pittsfield, Mass.

The Deane Steam Pump Company of Holyoke, Mass., issues an excellent 72-page pamphlet, describing its high grade triplex power pumps. These pumps are mostly of the vertical type, and are made both single and double acting. For mining use against heavy pressures the company makes horizontal single and double acting electrically driven pumps also electrically driven single acting vertical pumps for deep wells.

An exhaust head designed to separate the water and oil from exhaust steam by centrifugal force is described in a 7-page pamphlet published by the B. F. Sturtevant Company of Boston, Mass. This head is stated to contain no baffle plates, and yet to insure perfect separation. In the same pamphlet the Sturtevant Company describes a steam trap that is said to be fitted for operation with steam heaters or radiators of any description.

Catalogue No. 4 of the Ferracute Machine Company of Bridgeton, N. J., an illustrated pamphlet of 38 pages, describes the company's foot and power presses, and gives prices. The presses are for working bar and sheet metals, paper, cloth and leather. The company states that they are adapted for long, hard service. The rams are described as strong and heavy, with long adjustments and powerful grips. An unusually great height from bed to ram is said to permit the use of all kinds of high dies.

The Renold high speed silent driving chain is described in a little illustrated pamphlet issued by the Link Belt Engineering Company of Nicetown, Philadelphia, Pa. This chain, the pamphlet states, has a record of 6 years' successful use in England and on the Continent. In this country it is in use at the plants of the McCormick Harvesting Machine Company, Chicago, Ill., Coe Brass Manufacturing Company of Ansonia, Conn., Bement, Miles & Company, Philadelphia, Pa., Bullock Electric Manufacturing Company, Cincinnati, O., Western Electric Company, Chicago, Ill., Ingersoll-Sergeant Drill Company, Easton, Pa., Pennsylvania Railroad, Altoona shops, Altoona, Pa., and other concerns. The Ewart Manufacturing Company of Indianapolis, Ind., owns the American patents for the chain, but its application to machines and engineering uses will be in the hands of the Link Belt Companies of Philadelphia and Chicago.

GENERAL MINING NEWS.

Oil Exports in 1901.—The United States exported 1,062,750,306 gals. mineral oil in 1901, which compares with 975,123,476 gals. in 1900; an increase of 87,626,830 gals., or 8 per cent, chiefly in illuminating oil. As distributed the exports in 1901 were: Crude, 124,648,930 gals.; naphthas, 20,713,873 gals.; illuminating, 817,375,844 gals.; lubricating and paraffin, 73,031,127 gals.; residuum, 26,980,532 gals.

ALASKA.

DOUGLAS ISLAND.

Alaska United.—The report for the month ending December 15 shows 18,455 tons ore crushed, of a value of \$17,037, and 525 tons sulphurets, of a value of \$17,737. Total receipts for the month, \$38,810; expenses, \$26,909. Average of ore, \$2.10 per ton.

ARIZONA.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

Black Canyon.—Miners with dry washers are making from \$2 to \$3 in this canyon. The gold is reported coarse, with some nuggets weighing from 2 to 5 dwt.

Congress.—The incline shaft of this mine is down 3,250 ft.

MOHAVE COUNTY.

(From Our Special Correspondent.)

New Century.—Hughes & Mitchell are sinking on the ore body. The shaft is down 74 ft., and the chloride of silver ore averages about 20 in. thick.

Schuylkill.—The main working shaft is down 275 ft., on a small vein of very rich silver ore. Levels were run at 100 and 200 ft., and work has been continuous on the ore bodies. It is said work will continue to 1,500 ft. to connect with the Tennessee and Elkhart ore body.

Tintic.—A fine body of gold ore is reported opened recently in performing assessment work. The mine belongs to the Philadelphia & Arizona Mining Company.

CALIFORNIA.

Pacific Oil Wells Company.—This company reports under date of November 30 that its receipts up to that date were \$21,749 from stock sold—70,415 shares—and \$7,300 borrowed from W. D. C. Spike; a total of \$29,049. Expenditures in sinking three wells were \$28,583, leaving a balance of \$466. The net indebtedness of the company at the close of business on November 30, 1901, was \$2,999, to which must be added the loans made by Mr. Spike, but, as against this, the company has, as estimated realizable assets, \$466 in

treasurer's hands, and 12,918 5-18 shares of the 60c. stock, and a further block of 16,666 2-3 shares, which will be sold at not less than 75c. per share, aggregating \$20,717 available for further development—less expense of sale.

AMADOR COUNTY.

(From Our Special Correspondent.)

Bay State.—This mine, near Plymouth, after being idle for some time, is to start up again.

Zeila.—The shaft of this mine, at Jackson, W. F. Detert, superintendent, is being repaired and only half the force is employed.

BUTTE COUNTY.

(From Our Special Correspondent.)

Bloomer Hill.—A. B. Chambers has returned from the East and the mine and 15-stamp mill at Berry Creek will start again.

Hasleton.—The 10-stamp mill of this mine, at Enterprise, is about to start, and there is talk of more stamps being added.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Continental.—Ore is being crushed at the Paragon Mill, from this mine at West Point.

Deep Gulch.—Messrs. Kiser & Nanes, owners of this mine, Mokelumne Hill, have bonded it to Eastern men.

Fannie Marie.—Good ore has been struck in the 200-ft. level of this mine at Glencoe, owned by a Boston company, of which Geo. W. Brown is general manager. The company has recently purchased the Blue Jay Mine at Mokelumne Hill, and machinery is being put in by Manager F. O. Courtmarsh.

Monte Cristo.—Eastern men have bonded from S. H. Krim, this, the San Bruno and Good Hope Mines, near Glencoe. Mr. Krim has men at work also on the Sampson Mine at Glencoe.

Napoleon.—Arizona men have taken hold of this copper mine at Copperopolis.

Treat Ditch.—The Calaveras Mining, Water and Power Company, near San Andreas, of which Lafe Pence is general manager, has completed repairs to this ditch and will turn the water on to the Johnston gravel mine.

FRESNO COUNTY.

(From Our Special Correspondent.)

Copper King Mining Company.—The permanent injunction issued by the Fresno judge against this company for using traction engines for hauling ore on the county roads has been dissolved, but a temporary writ remains in force. A motion to dismiss the action of the County Supervisors was denied. The company spent many thousands of dollars in repairing and fitting the roads for the engines. Haulage by team would be too expensive for the grade of ore.

INYO COUNTY.

(From Our Special Correspondent.)

Poleta.—Work is being resumed on this mine at Bishop by Archie Farrington.

KERN COUNTY.

(From Our Special Correspondent.)

Probably the largest deal which has ever taken place in the history of the Kern County oil fields was consummated last week when the Southern Pacific Railway Company purchased 640 acres in the Kern River fields for a reported price of \$5,000,000. The property was owned and operated by the Imperial and the 33 Oil Companies and comprised some of the choicest land in the fields.

The following is a statement of the amount of oil shipped from and in storage at the Standard Oil Company's tanks in the Kern River fields for the year ending January 1, 1902.

Month.	Total Shipments.		Amount in Storage		Total
	Cars.	Barrels.	At Standard Co.	Barrels.	
January	615	.....	.....	92,250	.....
February	860	.....	.....	129,000	.....
March	1,296	.....	.....	194,400	.....
April	1,298	.....	.....	194,700	.....
May	1,457	.....	.....	218,850	.....
June	1,267	.....	.....	181,050	.....
July	1,802	.....	.....	270,300	.....
August	1,934	.....	195,000	395,100	.....
September	1,998	.....	175,000	474,700	.....
October	2,270	.....	280,000	620,500	.....
November	2,460	.....	245,000	614,000	.....
December	2,910	.....	195,000	541,500	.....
Grand Total	20,109	.....	910,000	3,926,350	.....

Assurance Gold Mining Company.—This company has installed an experimental mill capable of handling a ton of rock per hour. If the dirt is found rich enough to justify a large plant will be put in. F. Kettlehut, of Bakersfield, is manager.

Butte Mining Company.—This company with a mine in Randsburg has completed a tunnel between the 2 shafts at a depth of 850 ft. The mine has run into a rich vein of ore, the boundary of which is yet unknown.

Mercedes Oil Company.—This company in the Kern River fields has installed an air compressor for pump-

ing by air lift. The company also contemplates putting down 5 more wells.

Merton Mining Company.—This company with holdings at Randburg contemplates resuming work. The company has a good, but little developed property. Work stopped last summer. Charles Guild, of Bakersfield, is president.

Stanford Mining Company.—This company with holdings at Randsburg, has struck a vein said to be 12 in. and rich in gold.

LOS ANGELES COUNTY.

(From Our Special Correspondent.)

Vulcan Smelting and Refining Company.—Plans are being made for the erection of a 30-ton smelter at Los Angeles by this San Francisco company which promises to have the plant running in February.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

Hites Cove.—The work of cyaniding the tailings at Hite is finished and work is stopped at the mine.

May Harrison.—Extensive improvements have been made on this mine near Coulterville owned by the Merced Gold Mining Company, of Boston. F. P. Mills is superintendent, and a large force is employed. The company began milling ore on January 1. The ore is hauled to the 40-stamp mill, 3 miles distant on a steam railway.

Sodderberg & Chambers.—These men have put a 4-stamp mill on their mine below Kinsley. The mill is run by water power from the North Fork.

NEVADA COUNTY.

(From Our Special Correspondent.)

Gold Tunnel & California.—This mine on Deer Creek, Nevada City, is to be equipped with a complete electrical plant. G. Lezinsky, of San Francisco, is the principal shareholder.

Mento.—It is announced that a controlling interest in this group, at Grass Valley, consisting of the Wisconsin and Illinois claims, has been acquired by G. W. Starr, W. B. Bourn and associates. The property will be unwatered and developed. Both the claims were originally located over 40 years ago.

Red Cross.—This mine at Omega, 20 miles from Nevada City, is to be reopened by Geo. Bonney and A. J. Phillips, who have leased it from A. J. Brent. The mine already has a mill and a hoist.

Reward.—Men are again at work on this quartz mine at Nevada City, under James T. Gribble, superintendent. The hoist and mill are run by electric power.

Sierra Queen.—This mine, formerly the Stiles, in Grass Valley District, is to be worked by a new company under the superintendence of W. H. Martin.

Union.—The Union Blue Gravel Company, of North Bloomfield, is running a 5,000-ft tunnel and expects to complete it in 15 months. A shaft has been sunk and work is being done from that and from the tunnel mouth.

Yuba.—It is intended to put men at work and place suitable machinery on this mine, at Maybert, under the superintendence of H. W. Morris.

SAN BENITO COUNTY.

(From Our Special Correspondent.)

New Idria.—This quicksilver mine recently shipped 300 flasks of mercury, a very large amount for a single shipment.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

American Girl.—This mine at Ogilby has installed 8 new Standard concentrators. The mine is sinking to the 600 ft. level. The company brings its water from the Colorado River by a 12-mile pipe line. Ex-Governor H. H. Markham, of Pasadena, is president, G. H. Coffin, secretary, and Thos. Johnson, superintendent. The mine is among the best producers of Southern California.

California King Mining Company.—The mill for working the 16 claims of this company at Pichaco is under construction. Four and one-half miles of railroad track are being laid.

SHASTA COUNTY.

(From Our Special Correspondent.)

Midas Gold Mining Company.—This company at Knob is the largest quartz producer in Shasta county. The company owns 15 claims, a 20 stamp mill, cyanide plant, etc. Water power is used during the season and steam power in summer. The company is considering electric power from Gun Creek. There are 2½ miles of tunnels and shafts on the properties. J. H. Roberts, of Sacramento, is president; L. A. McIntosh, Chico, is vice-president, and A. J. Oswald is superintendent.

Mountain Lion.—Frank B. Roberts has bonded from M. W. Herron and A. W. Terskoff, of Redding, this mine near Shasta, and will work the property.

Ydalpom.—A strike of peacock copper ore is reported in this mine at Bully Hill, owned by P. M. Popejoy of Copper City. The tunnel is in 700 ft.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

John Brown.—F. M. Drumm, in charge of this mine, near Cottage Grove, is putting the mine in shape for winter work.

Minetta B.—Messrs. T. T. White and J. W. Martin have leased this mine at Nolton and are working it by water from Thompson Creek.

Van Brunt Company.—This company at Happy Camp is working 2 No. 5 giants at its hydraulic mine and recently installed a 45-light electric plant.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

Anaconda.—At this mine, near Columbia, owned by O'Hara & McKenzie, a strike of very rich ore has been made.

Atlas.—A. C. Morrison, in charge of this mine near Tuttle town, is clearing out the shaft preparatory to sinking.

Donnella.—At this mine, near Carters, the force of men is being increased.

Lone Star.—This mine at Big Oak Flat has been sold by F. B. Price to Merritt J. Read of San Francisco.

Longfellow Mining Company.—This company has deeded to the Armstrong Mining Company, of Monterey, the Longfellow and Toughnut Mines at Big Oak Flat as well as a 5-acre mill site.

Republican.—B. Delaney has taken charge of this mine at Chinese Camp.

Riverside.—At this mine near Carters the main tunnel is in 600 ft. and there remains 200 ft. to be run to tap the ore body.

Uncle Sam.—Men have been put at work by Robert Marshall on this mine at Carters.

Von Tromp.—This company has bonded 80 acres of land on the Doyle ranch near Columbia and is sinking shafts in the gravel.

YUBA COUNTY.

(From Our Special Correspondent.)

Victor.—These mines at Browns Valley, including the Pannenbridge and Pennsylvania, are reported sold to English purchasers. Lindsay Scruthen, of Orville, is to be manager.

COLORADO.

BOULDER COUNTY.

(From Our Special Correspondent.)

American.—Superintendent Powell at Magnolia is having a very large new boiler put in.

Derigo.—The Colorado & Northern Gold Mines and Tunnel Company, that is developing this tunnel at Sugar Loaf is preparing for an entire new plant of machinery. Electric drills are to be used. New boiler, engine and dynamos will be installed. Considerable ore has been encountered in the 2,500 ft. already driven. The tunnel is headed for the veins of the Logan and Yellow Pine groups.

Nancy Gold Mining and Milling Company.—This company has lately been incorporated by Boston, Mass., men. It has a capitalization of \$1,500,000, and controls many valuable claims in the Wall Street District.

Trojan.—This property in Sugar Loaf District, controlled by Meyer Bros., is producing some very good ore.

CHAFFEE COUNTY.

Buena Vista Smelter.—The work of rebuilding is progressing rapidly and a 100-ft. smoke-stack is being put up. Two furnaces are being erected and when these are in working order 2 more will be added. The main building will then be put up. The furnaces will have a daily capacity of 100 tons each. The old roofs have been taken off of the ore bins, and iron roofs will be substituted. The new machinery is all on the ground and about 50 men are pushing the work.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

Bullion King Mining Company.—In drifting on the adit 3 ft. of smelting ore was cut at a depth of 900 ft. under the apex of the mountain.

Colorado Specie Payment Company.—It is claimed that this company, working a group of claims on Bellevue Mountain, is declaring monthly dividends but the report cannot be confirmed.

Consolidated Franklin Mines Company.—This company has just installed a new Rand compound 8-drill compressor at the Silver Age Mill. A pipe line runs to the mines, a distance of 2 miles. The two shafts at the mines are being put in order.

Little Mattie Milling and Mining Company.—This company owning a big group of claims up Chicago Creek from Idaho Springs has purchased the General Thomas Newton and Wild Rose Mines for \$60,000, making one of the most valuable properties in Clear Creek County, as it controls over a mile of the noted Mattie vein. This company has put in another air compressor at the mill and will furnish air for

drills at the Mattie and Newton mines until the 2 properties can be connected. The consolidation ends all danger of litigation. The ore bodies have been proven for over 2 miles. The smelting streak ranges from a few inches to 3 ft. wide and averages \$100 per ton. Alongside is a wide body of mill ore which has never been successfully treated. The company will add tables at the concentrating mill with settling tanks and probably the cyanide process for slimes.

Monarch Mining, Development, Tunnel and Power Company.—This company, at Dumont, recently began patenting a group of 41 claims but advices have been made by P. R. Stanhope, Clarence Stevens and Mr. Silberhorn on most of the group. The tunnel is being driven with air drills for the Freeland Mine, and is in 1,000 ft. The distance is something over 5,000 ft. Several leads have been cut.

Waldorf Company.—In crosscutting at the tunnel in Argentine District the Independence vein was cut. It is claimed the streak is 3 ft. wide, running 180 oz. silver for a 5-ton shipment.

DOLORES COUNTY.

United Rico Mining Company.—This recently formed company, with \$3,600,000 capital, has headquarters at Denver. The directors are D. H. Moffat, A. B. Roeder, T. Walter Beam, of Denver; Joseph L. Caven, of Philadelphia, Pa.; W. N. Coler, of New York City; W. N. McKelvey and James H. Lockhart, of Pittsburgh, Pa., and Samuel Newhouse, of Salt Lake, Utah. The officers are: President, W. N. McKelvey; vice-presidents, D. H. Moffat and Samuel Newhouse; secretary and treasurer, A. B. Roeder; executive committee, Samuel Newhouse, chairman; A. B. Roeder and Walter Beam. Percy S. Rider, of Rico, will be superintendent of the entire property. Samuel Newhouse, as managing director, will superintend development. It is said that the consolidated properties have produced over \$11,000,000 worth of lead-zinc-silver ore in the past 12 years.

The purpose of the new company is said to be the creation of a market, and it will not antagonize the American Smelting and Refining Company, with which it has practically completed arrangements for handling all its ores. In effecting the consolidation, each company turned in, besides its properties, a certain amount of money which will be used for development.

GILPIN COUNTY.

(From Our Special Correspondent.)

Ore Shipments.—Judging from the heavy shipments of concentrating ores to Idaho Springs, there are good inducements for a new concentrating plant at Black Hawk. During the past week, besides daily shipments of 50 tons each from the Calumet and Old Town Mines, the following shipments have been made, mostly by rail: Tucker 150 tons, Boodle 100 tons, Grand Central 200 tons, Next President 100 tons, and several others of smelter tonnage.

Baldwin and East Baldwin.—G. H. Ellis Smith has taken a year's lease and bond in the sum of \$10,000 on these claims in Illinois Central District, and is preparing for active work.

Continental Mining Company.—Some high-grade ore has been opened in the east 120 ft. level, the average values being 15 ounces gold, 10 oz. silver and 8.10 per cent copper per ton or over \$300 per ton. B. M. Myers & Co. are operators, under a lease and bond, the property being owned by Chicago men.

Cumberland Mill.—Dickson Brothers & Neeline have started up the 5 stamp mill, and are running on Cumberland ores, at Yankee.

Kemp Calhoun.—McGrew & Company, leasers, are taking out ore from the 200 ft. level valued at \$160 per ton.

Sherman & Macon Mining and Milling Company.—Missouri men who are interested have a cross-cut tunnel in 390 ft. in Silver Creek, and intend to install an air compressor next spring. Colonel Brock, of Apex, is in charge.

GUNNISON COUNTY.

Southwestern Smelter.—This lead smelter at White Pine, of which E. C. Eddie is president and general manager, has been running several weeks and is shipping bullion to eastern refineries. Chicago and Denver people are stockholders in the company and L. Muther is secretary and treasurer. Custom ore is furnished by the David H. Akron, Erie, Ground Hog, Bullion and other claims, while the company is working the Lily, Silver Cord and Morning Glim.

Headlight Mining Company.—This company which has been doing considerable work on its property at Spencer in the lower gold belt has received a new plant of machinery which is to be placed on the Headlight. The shaft is down over 50 ft. The company will extensively develop the Headlight during the year and will sink the shaft 200 or 300 ft.

(From Our Special Correspondent.)

Gallop Basin.—Reports from the Ajax and Hercules Mines near Elko are favorable. A shaft has been sunk 100 ft. on a well defined vein. A new boiler has been

installed on the Galena Mountain Tunnel property, and work on the tunnel will be pushed.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

Sulphide Situation.—This should ease up somewhat. The Rocky Mountain Smelter at Florence has increased its tonnage several hundred tons daily while the Buena Vista Smelter will likely blow in next month. Work is also being pushed on the new plant at Salida of the Ohio & Colorado Smelting Company.

Chippewa Consolidated Mining Company.—At the annual meeting C. H. Graham, C. T. Limberg, S. W. Mudd, R. B. Estey, Alfred Thielen, J. A. Ewing, C. L. Hill, George E. Taylor, and F. E. Bouck were elected directors. They elected Mr. Limberg president and treasurer; Mr. Hill, vice-president, and Mr. Bouck, secretary. The annual reports show the property improving and work is prosecuted at No. 3 and No. 6 shafts. The ore bodies opened up are not large but quite rich, showing about 2 oz. gold to the ton.

Dinero Leasing Company.—A very good vein is being opened in the 5th level of the Dinero and several cars of high grade material have been shipped this month.

Midas Mining Company.—Shipments average 240 tons a day of iron ore which will net over \$4 to the ton. The ore has been proven 700 ft. one way and 500 ft. another, while the lower contracts have not yet been sought.

Yak Mining, Milling and Tunnel Company.—The tonnage is about 200 tons daily. About 50 tons is zinc ore, handled by the Sadler process at Cherokee, Kan.

Phoenix Mining Company.—This company is developing a fine manganiferous ore body in the old Sixth Street workings and shipping 150 tons a day to the steel works at Pueblo.

Rialto Leasing and Mining Company.—The water is out of the Pyrenees Claim and sinking is resumed. The shaft is down nearly 1,300 ft. after the iron sulphide shoot of the Greenback already traced by the diamond drill into this territory. Boston, Mass., people are heavily interested.

South Winnie Mining Company.—At the annual meeting F. W. Willis was elected president; R. C. Callen, vice-president; A. L. Eaton, secretary-treasurer. The annual reports showed the property in good condition and dividends amounting to \$15,000 were paid during the year. The company is sacking some very rich gold ore and extensive development work is planned. The ground is leased from the Fanny Rawlings Mining Company, that received over \$15,000 royalty during the year.

Valentine Mining Company.—It is hinted that the owners of the ground will not extend the lease but will work the project themselves. This would mean the loss of a large amount of stock held in Leadville.

Vinnie Mining Company.—This company has a portion of the Golden Eagle ground close to the Ixex lines and is increasing its copper sulphide shipments.

SAGUACHE COUNTY.

Cripple Creek-Idaho Gold Mining and Milling Company.—This company is preparing to erect a 50-ton concentrator mill at Crestone, near Short Creek. The company is composed of men connected with Cripple Creek mines. Mr. J. P. Fleischel is president and manager, R. G. Miller, secretary and treasurer; L. C. Whitney, superintendent.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

Gold Tunnel and Railway Company.—Men will start to work immediately on the ore tunnel in Animas Canon. An air compressor will be installed for power drills. A compressor is being installed for the 2 drifts in the Mountaineer vein. These drifts will each be driven 300 ft.

Grand Mogul.—Owing to lack of snow in the mountains, mill construction is suspended, as transportation of material is impossible over the rough roads. The production of ore has been increased and the mill building proper will be enlarged to install a drying room for concentrates. The compressor is in place and a telephone line completed to Silverton. A new mill of 500 tons capacity is soon to be built near the upper workings and a new compressor will be installed.

North Star.—This Silverton company has almost completed its new plant and the tramway will be in running order within a few days. The shaft is in soft porphyry and machine drills have been discarded for the present. Levels will soon be started to cut the vein.

SUMMIT COUNTY.

(From Our Special Correspondent.)

Robinson.—The pyritic smelter to treat the sulphides from this and adjacent mines is rapidly approaching completion. Frank Buckley, of Denver, is directing affairs at the mine and smelter.

TELLER COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

Ajaa Gold Mining Company.—At the annual meeting it was announced that the directors have closed a purchase of the claims adjoining the main group for \$170,500. The acreage, though not large, is said to be quite valuable and gives the company a total of about 35 acres. It was voted to increase the capitalization from 1,000,000 shares to 1,500,000 shares. It is understood that the company contemplates the purchase of more ground. The showing made last year was excellent.

Consolidated Mines Company.—Extensive improvements have been planned on the Wild Horse workings, including the surface equipment. It is probable that within a few months, a large shaft house will be started and a new ore house of 1,500 ton capacity erected. It is understood that the ore house will be the best equipped in the district, and will be near the Short line railroad. The mine has never had a direct connection with the railroad and the mineral has been handled by teams from the ore house to Vista Grande.

El Paso Consolidated Company.—This company has placed an order for a winze hoist to be operated by compressed air, for the 600-ft. level. The hoist will be under the Columbia shaft and an upraise will be put through to the bottom level of the Columbia, making a new surface connection with the bottom level of the El Paso. The Solitaire Company's lease on the Columbia expires on March 1, and the El Paso Company will have everything ready for work through the improved shaft by that time.

Greater Gold Belt Mining Company.—The annual meeting resulted in the re-election of the board of directors. The company was shown to be in good condition.

Katinka Gold Mining Company.—It is understood that the lessees on the August Flower claim have opened a body of ore, running higher than the usual grade, at 700 ft. The lessees are producing regularly from this level and also from the 6th level, where additional ore has been opened, and it is estimated that the output for January will run between \$15,000 and \$20,000. The company is receiving good royalties from this output. The surveys of the underground workings of this and the Mary McKinney Mines are not yet completed, but neither company wishes a prolonged law suit over apex rights. The Katinka Mine is situated further up Guyot Hill than the Mary McKinney.

Woods Investment Company.—The directors of the Gold Coin, Consolidated Gold Mines and New Zealand Consolidated, which are controlled by the Woods Investment Company, have declared the usual monthly dividend.

IDAHO.

CUSTER COUNTY.

(From Our Special Correspondent.)

Bayhorse District.—Much development is going on among the lead-silver and copper-silver mines, and the prospective Salmon River Railway arouses interest, as it will relieve the heavy cost of shipping and affords a ready market for the district's very desirable smelting ores.

Red Bird.—At this mine near Clayton the 110 ft. cross-cut tunnel being driven by a machine drill is in 800 ft. It is to tap the vein at a vertical depth of 800. This mine has produced \$700,000 worth of high grade lead-silver ore above the 400-ft. level, and the principal ore shoots in the 400 are going down strong.

Salmon River Railway.—It is reported that the extension of the Salmon River Railway from Mackey will start right away. The Oregon Short Line has a large crop of engineers in the field locating the line, and securing right of way west of Mackey and it is expected that grading will start within 60 days.

The new town of Mackey, only 100 days old, is making rapid progress, and already has a population of 1,200 people. It is surrounded by an extensive mineral district that is developing some handsome prospects.

White Knob Copper Company.—This company is pushing work on its 600-ton smelter and expects to have it in commission by April. The grade for the electric railway to connect the smelter and mines is about completed, and track laying will start at once. The line is about 10 miles long, and gains an elevation of fully 2,000 ft. above the smelter. The various mines are showing up some extensive reserves.

IDAHO COUNTY.

(From Our Special Correspondent.)

Big Buffalo.—E. S. Kinney arrived at Grangeville recently from Buffalo with \$7,500 in bullion, the result of two weeks' run in a 5-stamp mill. The public heretofore has had to guess how the ore was running. Five stamps are being added.

Hidden Treasure.—This claim, together with the Belle of Thunder Mountain, in Thunder Mountain District, has been acquired by the Hidden Treasure

Mining Company, recently organized under the laws of Delaware.

Jumbo.—Frank Brown, managing owner, deposited \$2,200 in the bank of Camas Prairie, Grangeville, recently, from about 2 weeks run of 4 stamps of this mine at Buffalo. This brings the bullion production to January 1 to \$17,500, with over \$6,000 worth of concentrates in stock. The ore in the stopes shows about 11 ft. wide.

LEMHI COUNTY.

(From Our Special Correspondent.)

Combination.—Some remarkably rich samples of specimen gold ore occasionally come to Salmon City from this mine, 13 miles east of town. The gold is light colored, worth about \$13 per ounce. The samples exhibited are said to be sorted from a vein 4 ft. wide that carries average values of \$10 to \$20 per ton.

Pacific Dredge Company.—This company at Moose Creek, 14 miles east of Salmon City, is rebuilding the large dredge destroyed by a boiler explosion last fall. Machinery is on the way, and the plant will probably be in working order by early spring.

Pollard.—This mine near Salmon City is producing 100 tons per month that finds a ready local market at \$5 per ton.

Ulyssus.—This mine at Indian Creek has been bonded to the Kittie Burton Company for \$75,000. The company contemplates erecting a large mill to work the 2 properties in combination. The Ulyssus has had a 5-stamp mill for 2 years, and has paid a net profit of \$1,000 per month; it has a 10 ft. vein and mills \$10 per ton.

OWYHEE COUNTY.

Ivy Grace.—Dave Adams and White Bros. have a 5-stamp mill running at this property near Flint.

SHOSHONE COUNTY.

Cocur d'Alene Mining Company.—This company is installing machinery to replace the hydraulic elevator at its ground near Sunset.

Grangeville Hydraulic Mining Company.—This company with headquarters at Grangeville has filed articles of incorporation. The capital stock is fixed at 300,000 shares of the par value of 50c. One-half of the stock is subscribed by the following incorporators: B. C. Wiltse, W. R. Crosby, B. L. Crosby, Joe C. Meingassner, Charles G. Aldrich and Frank J. McKay, all but Mr. McKay being members of the board of directors. The company will work in the Pierce City District.

ILLINOIS.

SANGAMON COUNTY.

(From Our Special Correspondent.)

Cantrall Co-operative Coal Company.—At Cantrall this company, whose mine has been on fire, was to resume operations on January 20, the fire having been extinguished.

Sangamon Coal Company.—This company, of Springfield, has equipped its mine with shaker screens.

INDIAN TERRITORY.

CHOCTAW NATION.

(From Our Special Correspondent.)

McAlester Coal Company.—This company, under the direction of Franklin Bache, its president, is doing much development work at its Bache Mine, just east of Alderson. Many new openings are being made, and the output greatly increased.

Meaicen Gulf Coal and Transportation.—This St. Louis, Mo., company has re-organized and increased its capital stock from \$200,000 to \$500,000. The following officers have been elected: Z. W. Tinker, president; Prof. W. B. Potter, vice-president; J. L. Carlisle, treasurer; A. L. Steinmeyer, secretary. The officers are residents of St. Louis, where the company's head office will be. F. Bache has been the receiver of the company for some time pending its reorganization.

MICHIGAN.

COPPER—HOUGHTON COUNTY.

(From Our Special Correspondent.)

Atlantic.—A head at the mill is stamping rock from the Champion Mine. Drifting in the cross-cut from the exploration shaft on section 16 is under way.

Baltic.—At the new mill one head is treating regularly about 400 tons of rock per day. Work on the second head is progressing, and it will likely go into commission by April.

Calumet & Hecla.—It is stated that this company contemplates erecting a pumping plant at Little Traverse Bay to supply the works at Lake Linden. Negotiations for a right-of-way 100-ft. wide for a pipe line from Little Traverse Bay to Lake Linden, a distance of 7 miles, are under way.

The new steel building to contain the generators for the 6-head addition to the Hecla Mill, at Lake Linden, is well along. The American Bridge Company will have the framework finished this month.

Repairs to the Red Jacket shaft, damaged recently by falling cages, have been completed.

Champion.—This company has awarded a contract to the Nordberg Manufacturing Company, of Milwaukee, Wis., for an 80-drill compressor, to be delivered at an early date.

Oscola.—The 3-head addition to the mill at South Lake Linden is nearly completed, and it is expected that 3 stamps will start stamping within 6 weeks. The washing machinery for 3 heads, consisting of 110 positive slow return jigs manufactured by the Portage Lake Foundry and Machinery Company, and 18 round slime tables, is all in place. The Wilfley tables, one for each head, remain to be installed.

The new steel boiler house, adjoining the mill on the west, is completed and supplying the old mill with steam. The building is 43 by 150-ft., and contains 9 boilers of the locomotive firebox type. Three boilers will be installed as soon as possible. The old boiler house is out of commission.

An Overstrom diagonal concentrating table, manufactured by the American Engineering Works, of Chicago, Ill., has been installed in the old mill for experimental purposes.

Tamarack.—The concrete foundation for the new Ingersoll-Sergeant compressor, to be installed at No. 5 shaft, is about completed. No. 5 shaft will not be a heavy producer until about July.

H. T. Lewis, who has had charge of the North branch of the mine for several years, has resigned to become superintendent of the Rock Lake copper mines, in Ontario.

Trimountain.—A daily output of 550 tons of rock is maintained, which is shipped to the Arcadian Mill. The underground force has been slightly increased.

Winona.—At this property No. 2 shaft is being timbered to the 6th level prior to the resumption of sinking.

Wolverine.—No. 3 shaft is sinking to the 22d level, and No. 4 shaft to the 18th level. The machinery is being placed in the new mill on Traverse Bay.

Wyandotte.—Work is confined to diamond drill exploration. At present 2 drills are in commission.

COPPER—KEWEENAW COUNTY.

(From Our Special Correspondent.)

Phoenix.—About 50 men are grading for the railroad to connect the mine and the mill site on Eagle River. The steel will be laid as soon as the snow leaves the ground.

COPPER—ONTONAGON COUNTY.

(From Our Special Correspondent.)

Mass Consolidated.—Since January 1 nearly 120 men have been discharged. The underground force has been increased considerably. At present 300 men are employed, and 25 power drills are in commission. About 100 tons of mass copper has accumulated, and will be shipped direct to the Lake Superior Smelting Works.

IRON—MARQUETTE RANGE.

(From Our Special Correspondent.)

Raphael Pumpelly has obtained options from Houghton County on lands in 31-48-28 and 24-47-31, in the magnetic iron ore district. The options extend over a period of 20 years. The minimum royalty for the first 5 years after the production of the ore starts is placed at \$1,000, after which time the royalty will be raised at the discretion of Houghton County. Professor Pumpelly will conduct a thorough exploration of the lands in the interests of a group of Eastern men.

MINNESOTA.

(From Our Special Correspondent.)

The Eastern Railway of Minnesota is replacing its smaller locomotives with heavier ones and is building a steel girder bridge across the St. Louis River at Stoney Brook, where it will have its terminal yards. This point is about 25 miles from the docks, but it is found convenient to take ore down as wanted by dock agents and to handle the full trains to the north by main line engines. The road is now figuring on shipments the coming season approaching 3,000,000 tons.

The Duluth, Missabe & Northern Road is also to buy several heavier locomotives, and is building a large steel girder bridge, on concrete abutments on the Hibbing branch.

The indications are that many more mines will be shipped in the Minnesota District this year than ever.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

The Williams estate, of Chicago, owner of the Biwabik fee, is starting explorations on lands it owns, and has Edwin A. Sperry, of Colorado, in charge. Several drills will be put at work as soon as they can be had.

Alexander Maitland, manager of mines for the Republic Iron and Steel Company, has taken a lease on the ne 1-4 of the ne 1-4 of section 7 T 57, R 17, lying south of the Fayal lands. The royalty is 25c. on an annual minimum output of 50,000 tons.

Buckeye.—M. L. Fay has taken an option on the Buckeye and adjoining lands in section 36 T 56, R 25, in section 31 T 56, R 24, and in section 1 T 55, R 25. The Buckeye has been explored more or less frequently and is known to contain some hard ore banded with silica. It is a state lease at 25c. royalty.

Enterprise.—This forty, belonging to W. C. Yawkey, of Detroit, has been sold to the Eastern Minnesota Road for \$150,000. It is the sw 1-4 of the nw 1-4 of section 5 T 58, R 17, and adjoins the Alpena and Saunary. Some fairly good ore has been shown. The Eastern has been exploring to the west in section 6, but unsuccessfully.

Oliver-Snyder Mining Company.—This company's new property in 22 T, 58 R 20 has the 4-compartment shaft down 50 ft., but progress is very slow owing to quicksand. The machinery is all in place, the buildings up and the force is being increased as fast as room can be found. It is probable that the mine will be very wet, as most of the ore lies under a large swamp.

Pickands, Mather & Company.—This firm owns what has been known as the Fay property in sections 4 and 5, T. 58, R. 17, which was bought of Messrs. Fay, Roberts and Pearce for \$110,000 for the leasehold. It has finally been decided to open the property underground and 2 shafts will be sunk at once. Both will be 2-compartment and the work of opening will be under charge of Captain John Roskilly, from Ishpeming. So far as now proved there is a small ore body that is good in structure and analysis. The lease carries a royalty of 30c. on a part of the land and 35c. on the rest, to certain lumbermen. The mine will be called the Minorca, Pickands Mather & Company's other Mesabi mines being the Elba and Corsica.

Pitt Mining Company.—This company has taken a lease from the West Missabe Land Company (James J. Hill) of 160 acres in T 57, R 21, the s 1-2 of sw 1-4 of section 2, and the n. w. 1-4 of n. e. 1-4 and the n. e. 1-4 of n. w. 1-4 of sec. 11. A bunch of ore has been shown especially on the nw of the ne of 11. Royalties are on a graduating scale, starting with 20c. for an output of 50,000 tons annually, 17 1-2c. above 100,000 tons output, 15c. above 200,000 tons, and 12 1-2c. for all ore mined annually if the amount shall reach 500,000 tons. If any reduction is made in freight rates to Lake Superior from the present 80c. rate, the amount of the reduction shall be added to the royalty, and all ore removed shall be hauled to Lake Superior on the Eastern Minnesota Road.

United States Steel Corporation.—This company is about to open a mine on the land called the Pillsbury lease, the east side of the Pillsbury Mine in section 29 T 58, R 20, between the Pillsbury and the Clark. The East Pillsbury is a 25c. lease with 100,000 tons annual minimum. The ore is of the same general character as the Pillsbury and there is a large body of it. It is probable that it will be worked for a time at least through the Pillsbury openings.

The same corporation has begun explorations in the se 1-4 of the ne 1-4 of section 20, T 58, R 19, adjoining the town of Buhl and near the Sharon Mine. It has also let contracts to Winston Brothers & Dear for a large stripping job on the Burt, in section 31 T 58, R 20, where drill work has shown the ore body to run to the north of the old mine under about 30 ft. of surface. The stripping will require 2 or more years probably and will start at once.

The corporation's Duluth Mine at Biwabik will probably take out about 160,000 tons this year and is now running slowly cleaning up a few stray patches of ore before opening up the main body. Considerable underground mining will be carried on in addition to milling. The Genoa Mine will sink its main shaft 100 ft. deeper this winter.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

Pioneer.—This mine is now hoisting about 40,000 tons a month, and Chandler about the same. There will be stocks amounting to about 750,000 tons at the opening of navigation.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

Joplin Ore Market.—The past week was one of the most active in the history of the district. The output was remarkably large and the valuation has not been exceeded during the past 2 years. A new company, the Standard Acid Company, of Iola, Kans., which has just completed several blocks of zinc smelters to be operated by natural gas is expected to buy zinc ores soon.

The highest price paid for zinc ore during the week was \$31 per ton. The lower grades did not advance in proportion, however, and zinc ore can merely be said to be unusually strong.

Lead ore brought \$21 per 1,000 lbs. delivered. This price has been paid ever since the cut in price during December. The entire production was cleaned up.

Following is the turn-in by camps of the Joplin District for the week ending January 18:

	Zinc lbs.	Lead lbs.	Value.
Joplin	3,271,420	669,370	\$61,493
Galena-Empire	1,450,400	139,410	22,508
Cartersville	1,966,190	310,930	33,074
Aurora	990,000	39,360	13,427
Oronogo	465,020	15,260	6,625
Duenweg	519,440	68,890	8,719
Webb City	519,310	29,020	7,620
Neck City	544,340	99,270	11,107
Spurgeon	323,310	88,210	5,682
Zincite	366,620	9,710	5,520
Cave Springs	255,380	14,900	4,016
Carthage	535,100	.....	7,893
Carl Junction	356,320	.....	5,197
Granby	233,060	72,000	3,673
Roaring Springs	147,420	3,080	1,081
Central City	138,960	3,660	1,814
Stotts City	175,410	.....	2,543
Sherwood	123,780	.....	1,795
Badger	35,020	20,790	344
Springfield	43,710	.....	612
Total	12,450,150	1,604,070	\$205,229
Total Corresp'd week last year	10,252,870	1,452,720	\$151,468
Zinc value for week, \$171,985; lead, \$33,244. Zinc and lead value, 3 weeks, \$514,941.			

JASPER COUNTY.

(From Our Special Correspondent.)

Aida No. 2.—At this mine on November 16 a snow shed in which the men were working was crushed by a large slab which fell from the roof. Four men were killed outright or died from their injuries. The mine is 2 miles southeast of Cartersville, Mo.

MONTANA.

BEAVERHEAD COUNTY.

Queen of the Hills.—This property in Vipond District has made a successful trial run in the 10-stamp mill recently erected. The first bar of bullion has gone to the United States Assay Office at Helena. The property is owned by J. F. Robden and Virgil Jennings and is opened by a shaft 210 ft. deep with 300 ft. of levels at the 100. Eighteen miners are employed. A car of iron concentrates, the first made, was shipped to the smelter at East Helena.

CASCADE COUNTY.

(From Our Special Correspondent.)

Diamond R.—Judgment for \$86,180 and costs was obtained by default in the United States Court at Helena in favor of C. D. McClure, of St. Louis, Mo., and against this company. This represented the total amount of 18 notes given by the company to McClure to secure funds for the construction of the concentrator at Neihart during 1900 and 1901. Mr. McClure is a heavy stockholder in the company.

Galt.—After some years of idleness this old silver mine at Neihart is to be reopened. President Frank Manor, of the Galt Mining Company, has been in the camp and given a contract for unwatering the workings to R. G. Vaughn.

Queen of the Hills.—This property at Neihart, it is reported, will soon be in operation again with a full force of miners. The understanding is that the ore will be treated in the Diamond R. Mill.

MADISON COUNTY.

(From Our Special Correspondent.)

The largest gold nugget ever received at the Helena Assay Office was deposited recently by Thomas Raymond, a miner, who found it on bedrock at a depth of 30 ft. in Alder Gulch near Junction, a short distance from Virginia City. Its melting weight amounted to \$1,405.

Big Show.—C. E. Lentz, president, has contracted for hoisting machinery and has also secured the 10-stamp mill built some years ago at the King Mine near Twin Bridges. The mill will be moved to the Big Show.

POWELL COUNTY.

(From Our Special Correspondent.)

Arnold.—This property on Snowshoe owned by Dr. G. E. Blackburn, of Butte, is under bond at \$40,000 to John F. Cowan and others. The operators are to sink a shaft 100 ft. The ore at present is a carbonate of copper. Two cars shipped to Butte carried 17 per cent copper and some gold. The lead is in lime and is fully 20 ft. wide between walls.

RAVALLI COUNTY.

(From Our Special Correspondent.)

Anaconda Copper Mining Company.—This company has sold the Ravalli County Bank to local parties headed by W. W. McCracken, of Hamilton, and the company retires from the banking business. The management of the Hamilton Townsite, water and electric light plant of the Anaconda Copper Mining Company has been transferred from the bank to the Mercantile department of the Anaconda Company.

SILVER BOW COUNTY.

(From Our Special Correspondent.)

Anaconda.—The buildings of the different mines are being heated by the Warren Webster vacuum system. Exhaust steam from the compressor plant of the Never Sweat Mine is conveyed by pipes to the various buildings, in one instance 4,000 ft. to the St. Lawrence Mine. This is the first instance where this system has been adopted in this State. It is being installed

under the supervision of James G. Graham, of Cleveland, O., for the American Engineering Specialty Company, of Chicago, Ill., the western agents for the Warren Webster System.

Boston & Montana Copper Company.—This company's mines are again in operation after a shut down of several months.

Carlisle Copper Company.—This company, with 500,000 shares of stock, par value of \$1, has been organized to take over the Carlisle copper claim near Columbia Gardens. It is the successor of the Butte & Anaconda Copper Company which attempted to do business on a name, but soon met with disaster. The present company has better backing.

Emma.—The shaft is down 500 ft. Sinking is to continue for 200 ft. more. The bottom of the shaft shows considerable ore.

Leonard.—A 20-ton crane is being put in opposite the machine shops, to facilitate the unloading of heavy machinery and other heavy material.

West Olive Branch.—This property under bond to the Butte Mining and Development Company. will probably be surrendered to the owners, as the bondholder intends to confine operations to the development of the Emma Claim.

NEVADA.

ELKO COUNTY.

(From Our Special Correspondent.)

Deater-Tuscarora Consolidated Mines Company.—This company, at Tuscarora, treated on an average about 100 tons of ore per day and produced during 1901, \$167,901 in gold and silver bullion and cyanides. The profits, including improvements, are given as \$45,000. Operations were carried on under difficulties caused by shortage of water and power during the greater part of the year. The company has over \$500,000 worth of surface improvements, including electric power transmission lines. The office of the company is in Salt Lake, Utah.

WHITE PINE COUNTY.

(From Our Special Correspondent.)

Chairman Mining and Electric Company.—Geo. B. Dunham, general manager, has gone East and will remain until after the annual meeting. The copper ore on the 200 ft. level is being opened. The starting of the mill is postponed owing to extensive changes in the power plant, for which new machinery will be ordered.

Copper Flat Mining Company.—New boilers have recently been installed at the hoist. Cross-cutting continues from the 300-ft. level, showing low grade ore carrying copper and gold. This property is under bond to Messrs. Mulford Martin & Hook, of New York City. Jos. Bray is general manager.

Osceola Mining District.—Drifting in the placers goes on steadily and dumps are accumulating for the spring waters. Several dry placer machines are in use. The water for washing is controlled by the Osceola Gravel Mining Company, which has 2 ditches from 15 to 20 miles long, bringing water from springs and streams in the Snake Mountains. Insufficient rain and snowfall for the last 7 years has prevented the company from operating its placers on an extensive scale, and water has been sold to the smaller mines. About \$10,000 in placer gold was taken out in 1901.

Pilot Knob Copper Mining Company.—This property, backed by Wisconsin capital, is erecting a central compressor plant, from which the air will be conducted 3,000 ft. to the various workings; 75 men are employed in the various shafts and prospects. George F. Paul is superintendent and H. A. Elliott, of Eau Claire, Wis., financial agent.

NEW YORK.

WARREN COUNTY.

Lake George Stone and Marble Company.—This company will put in a steam saw mill in the spring at its quarries in Warrensburg. The company has opened an office in Glens Falls.

NEW MEXICO.

GRANT COUNTY.

Clifton Copper Company.—This company at Deming has closed down its concentrating plant to make needed repairs and additions. When it starts again, it will be a 150 ton plant, instead of 80 tons daily, its present capacity. M. Z. Elliott of Clifton, Ariz., has charge.

Fierro District.—A few copper producers at Fierro have closed down. More serious has been the stoppage of iron shipments.

Granite Gap.—This old mine at Granite Gap is shipping a car-load of ore per week from Stein's Pass. All the properties in the Stein's Pass District are reported working, though shipments are not very large.

Mineral Mountain Company.—This company is building a 50-ton concentrator at the Buck Mine at Stein's Pass.

Wilson Company.—This company is working the Volcano Mine at Volcano. The ores are chloride of

silver, carrying considerable gold. The company's mill is ready for operation.

(From Our Special Correspondent.)

Lena Mining Company.—This company at Lordsburg will have completed within 6 weeks a new concentrator plant. It will cost nearly \$50,000. The ore will come from the company's claims 6 miles south. Prof. Carrera, who will be manager, is also one of the principal owners. C. T. Brixner, of Silver City, erected the plant which has a capacity of 150 tons every 24 hours and has 4 Huntington mills, 4 Wilfley tables, 3 new Standard concentrators and 2 Bartlett's. There are 6,000 tons of ore now on the dump.

Pacific Union Mining and Smelting Company.—This company, of Lordsburg is now operating a Vulcan furnace plant.

OHIO.

The Baltimore & Ohio is now operating the Ohio & Little Kanawha Railroad, formerly known as the Zanesville & Ohio Railway, control of which it recently acquired by purchase. The line extends from Zanesville to Marietta, a distance of 80 miles. It is said that the purchase of the Ohio & Little Kanawha, coupled with those of the Cleveland, Lorain & Wheeling, Ohio River and West Virginia Short Line, gives the Pennsylvania interests, through the Baltimore & Ohio, virtual control of the coal fields of northern West Virginia and southwestern Ohio.

OREGON.

GRANT COUNTY.

Badger.—It is said that this company may build a large reduction plant near Susanville in the spring.

Gold Cross & Eagle Mining Company.—The directors of this company recently held a meeting at Terre Haute, Ind., and elected the following officers: President and treasurer, W. R. McKeen; vice-president, J. H. Chandler, of Chicago; second vice-president, Willard Kidder; secretary, N. S. Kidder.

JOSEPHINE COUNTY.

Oregon Consolidated Mining Company.—This company has 30 claims on Soldier Creek. The principal owners are said to be: Judge Thomas Carroll, Tacoma, Wash.; W. J. Murphy, Chicago, Ill.; Geo. A. Cole, Fredrick Eidomuller, D. Phelps, Fred H. Miller and A. U. Mills. The company's placer on Cow Creek Canyon has two No. 4 giants at work. The ditch is 3 1-2 miles long.

LANE COUNTY.

(From Our Special Correspondent.)

Bald Butte.—A 300-ft. tunnel contract is completed. The mine will be shut down during the remainder of the winter.

Black Butte District.—Almost the whole of this quicksilver district is said to be owned by one man, or company. Active development has been progress for more than 2 years. Three years ago the property was equipped with a 40-ton Scott continuous furnace, which proved a failure. The mine is worked entirely by tunnels, the topography admitting 1,800 ft. depth above water level.

Bohemia District.—The railroad survey from Cottage Grove to Bohemia District is nearing completion. The line will be 36 miles long, and will connect with the Southern Pacific Railroad. A telephone line is completed connecting the district with outside points. Much activity in the camp is promised for next spring providing construction on the railroad begins. The free milling surface ores of this district all turn to sulphides with only shallow depth and without a railroad or local smelter the camp has little value.

Cinnabar Butte.—This mine is now owned by H. S. Reed, of Oakland. Preparations are under way for active work next spring.

PENNSYLVANIA.

ANTHRACITE COAL.

Natalie.—The big colliery at Natalie employing 1,200 men is closed down indefinitely. All the fires except those supplying steam to pumps have been drawn.

Temple Iron and Coal Company.—This company has men erecting a washery adjoining the Johnson breaker. A 12-in. hole will be bored to the Clark vein to dispose of the culm and ashes.

West End Coal Company.—This company has bought the land adjoining its colliery at Mocanaqua and has staked it out for the building of 100 houses for the accommodation of employees.

BITUMINOUS COAL.

General Daniel H. Hastings and Col. John L. Spangler of Bellefonte have, it is said, a deal by which they sell to Eastern men a tract of 5,000 acres of coal lands, located in Barr, Susquehanna and Green townships. The price paid is given as \$510,000 or at the rate of \$110 an acre. Mines will be opened near the head of Moss Creek and a 4-mile railroad built.

It is stated that a syndicate of Pittsburg capitalists, represented by S. M. Taylor and J. H. McRoberts, has concluded negotiations for 11,000 acres of coal

land in the first pool district. The price is said to have been \$8,000,000. Eight mines are to be opened, to have a daily capacity of 12,000 tons. The field is 5 miles south of Pittsburg and includes 5,200 acres owned by Jas. Scully, 17,000 owned by J. B. Corey and 2,500 owned by F. J. Le Moyné. The property is crossed by the West Side Belt, the Baltimore & Ohio, the Pittsburg & Lake Erie, and the Pittsburg extension of the Wabash Railroad. A company will be formed to develop the field.

It is said that the consolidation of a number of the active coal operations in Somerset County under one management will, in all probability, be consummated soon. Agents of the syndicate some months ago secured options on nearly all of the active plants in the Meyersdale District and Berlin fields along the Somerset and Cambria branch of the Baltimore & Ohio Railroad, except the Berwind-White, Merchants', Niverton and Reading Companies. The properties affected are located at Landstreet, Hooversville, Wells Creek, Listie, Milford, Wilson Creek, Pine Hill, Garrett, Casselman, and include all the active plants along the Salisbury branch. The property is in the neighborhood of 10,000 acres of land. The men composing the company are Winfield S. Sheard, A. Austin Buzy, of Philadelphia; James A. Bunting, of Secone, Pa.; Warner B. Matterns, Arthur N. Taylor, Henry M. Haviland, Samuel B. Lawrence, Henry C. Everdile, Robert G. Meade, Jr., and Stephen A. McIntire, all of New York City.

Monongahela River Consolidated Coal and Coke Company.—At the annual meeting the following directors were re-elected: J. B. Finley, George W. Theis, H. C. Fownes, S. S. Brown, Hugh Moren, August Jutte, O. A. Blackburn, George I. Whitney and W. E. Rodgers. The annual statement of President Finley showed an increase of cash on hand of \$64,189; accounts receivable \$820,891, and of coal on hand \$252,123. The total value of the coal on hand is placed at \$1,828,530. The current debts are \$3,510,751, an increase over last year of \$1,361,280. The undivided profits were \$361,374.

Niverton Company.—This company of Baltimore, Md., has purchased 7 tracts of coal land in Brothers Valley, Somerset County.

United Coal Company.—This company, of which W. S. Kuhn is president, and L. S. McClelland, secretary, has acquired more coal lands from J. D. O'Neill in Lincoln and Elizabeth townships, Allegheny County. The entire purchases amount to nearly 7,000 acres, and give the company a river frontage in the tracts taken over.

LEHIGH COUNTY.

Bittner Slate Company.—This company has leased the property of Bittner & Rex at Slatedale, and has made a contract for stripping the top in preparation for the opening of a new slate quarry.

Snowden Slate Company.—The real estate of this company, near Slatedale, has been purchased at sheriff's sale by George P. Young, trustee for the bondholders, for \$7,000. The same person also bought the franchise and shed for storing slate for \$125.

NORTHAMPTON COUNTY.

Leighton Slate Company.—This company has been organized to operate a slate quarry at Danielsville. The officers are: John Seaboldt, secretary; N. M. Balliet, treasurer. The other members of the company are Horace Heydt, Charles H. Seidle, John Gomery, Dr. T. C. Horn, W. H. Seip, Dr. J. A. Horn and John H. Lentz.

SOUTH DAKOTA.

CUSTER COUNTY.

(From Our Special Correspondent.)

Clara Belle.—The Tremaine mill is running again, after an idleness of several weeks.

Saginaw Mining and Milling Company.—The hoist at the Newark has been purchased and installed at the shaft. Exploration is carried on with a diamond drill. The company is experimenting with a dry process of extracting gold by electricity.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Deadwood-Standard.—The new cyanide plant at Ragged Top has been running two weeks. It has a capacity of 200 tons per day of 24 hours, but is only running one shift, treating 125 tons. The main ledge is 22 ft. thick.

Garden City Mining Company.—At the annual meeting at Central City directors were elected as follows: R. G. McGillis, J. B. LeBeau, George W. Crise, E. P. Peterson, and Eli Cornett. The company has lately discovered a body of free milling ore near Garden City, 3 miles north of the Homestake.

Homestake Mining Company.—The foundation is complete for the new 600-ton cyanide plant at Gayville, and the frame is being erected. The building will be 65 ft. wide and 300 ft. long, and will handle the tailings from the De Smet, Deadwood-Terra, and Caledonia stamp mills.

Minnie Mining Company.—Nelson Shaw is working this property on a lease.

Spearfish Mining and Reduction Company.—The new cyanide plant on Johnson Gulch will be ready February 1. It is a duplicate of the old mill except that it has larger tank and more powerful engines. It is expected to mill 250 tons a day. A locomotive and several cars have arrived for the tramway between the mine and mill.

Wasp No. 2 Mining Company.—A 13-days' run at the 100-ton cyanide plant on Yellow Creek, it is said, resulted in 635 oz. of bullion, worth over \$5,000. There is a large amount of silver in the bullion.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

Cochran Group.—James Cochran has disposed of his group of claims to Charles Gates and C. S. Roberts, of Chicago, for a reported price of \$150,000, \$25,000 down. There are 8 claims and a Huntington mill that has been run during the summer months for several years. The main ledge is 75 ft. wide and the pay streak is reported 25 ft. across. The purchasers are going to organize the Cochran Mining Company.

Elizabeth Mining Company.—The 40-stamp mill at the Bismarck is running steadily. The Holy Terror 10-ton cyanide plant has been leased to experiment on the arsenic ores of the company. Cyanide will be tried. The company has recently put in settling tanks to catch the water from the concentrators and use it again in the batteries.

Holy Terror-Keystone.—The company intends to make experiments with various processes on the ore from the Keystone Mine that carries too much arsenic to be cyanided by the process, and is not desired by smelters. It contains from \$2 to \$3 in free gold, but concentrates carry 23 per cent. arsenic.

UTAH.

(From Our Special Correspondent.)

Salt Lake Bullion Settlements.—The lead bullion containing gold and silver shipped East to refiners by the Salt Lake Valley smelters for the week ending January 18 was valued at \$62,300. During the same period the banks made settlements on gold bars amounting to \$125,000; copper bullion, \$24,400.

Utah Metal Product for 1901.—Following is Wells, Fargo & Co.'s statement of State's output:

	Copper lbs.	Lead unref. lbs.	Silver, base lbs. ozs.	Gold, base lbs. ozs.
Smelters in Utah.....	20,941,106	38,555,200	4,262,983	52,041
Mercur District.....	.....	58,518,700	.....	81,722
Park City District ores shipped.....	2,375,574	.....	6,354,280	291
Tintic District ores shipped.....	2,363,993	.....	377,216	7,966
Other districts (part of Tintic).....	1,593,952	1,725,100	147,514	86,572
Total.....	27,274,526	98,799,000	447,451	113,371

BEAVER COUNTY.

(From Our Special Correspondent.)

Ben Harrison.—This group of 10 claims in the Beaver Lake District adjoining the O. K. Mine, has been making regular shipments of copper ore to the Salt Lake smelters. An assay from the surface shows a vein 7 ft. wide, running 1.5 per cent copper and .51 oz. gold. An incline shaft is down 130 ft. and work will continue to 300 ft. J. J. Trenam, of Salt Lake, is in charge of development and expects to equip the mine with a steam hoist, air compressor and machine drills.

Horn Silver.—This property shipped to Salt Lake Valley smelters during the week ending January 18, 3 carloads of lead and silver ore.

BOX ELDER COUNTY.

(From Our Special Correspondent.)

Century.—The working force of this mine and mill, located in Park Valley District, attached a car-load of concentrates, averaging about \$40 per ton, for back wages. The manager, Percy Williams, has resigned and the mill which has been built but a short time, will close. Mr. Williams accepts the temporary management of a property near Prescott, Ariz.

EMERY COUNTY.

(From Our Special Correspondent.)

Hecker Mining Company.—This company, 9 miles west of Woodside, owns the Eagle group of 5 claims, from which good assays in silver lead and copper are reported.

IRON COUNTY.

(From Our Special Correspondent.)

Ophir Mill.—This new mill at Statefine has closed down from lack of water. The company's manager, F. H. Lathrop is in quest of suitable 3-in. pipe for a 15 mile line from another spring which is being developed. The present water supply is sufficient for but 12 hours run daily.

JUAB COUNTY.

(From Our Special Correspondent.)

Carisa.—At this mine near Eureka a new electric drill is on trial. The Northern Spy, which adjoins and belongs to the same company, has cut its 800-ft. station.

Centennial Eureka.—The shaft at Eureka is re-timbered to between the 500 and 600-ft. level, the balance, making a total of 1,700 ft., is expected to be finished by May 1.

Mammoth vs. Grand Central.—This big suit is still on at Nephi. Both companies have their testimony in.

Mayday.—This property at Eureka, equipped with the Wood dry concentrator, has shipped a car-load of concentrates and 1 of slimes. Considerable difficulty has been experienced with the sizers and the whole plant has been greatly altered since work began.

Star Consolidated Mining Company.—This property at Mammoth is filling one of the 500-ton bins of the Mammoth Mill with \$15 ore, preparatory to a trial run to determine the policy of the company regarding a mill.

Victor.—The manager of this mine at Eureka, E. V. McCune, reports a recent shipment of 4 cars of ore, assaying .8 oz. gold, 20 oz. silver and 16 per cent copper. Air drills are used for drifting and on the 300-ft. level a 12-ft. breast of ore is reported exposed.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

Bingham Shipments.—Following are the ore shipments to the Salt Lake Valley smelters for the week ending January 18: Commercial, 6 cars; Silver Cord, 1 car; Ben Butler, 4 cars; Butterfield, concentrates, 3 cars.

Bingham Consolidated.—The tunnel to drain the Dalton & Lark ground, and other claims near Bingham is in 2,290 ft., and is averaging 12 ft. a day.

Butterfield.—Jules Poben, of Paris, France, one of the heaviest stockholders, has filed papers against the company for an indebtedness of about \$112,000, which he alleges to have advanced since 1895, for working and improving the property. The mill and mine are near Bingham in Butterfield Canyon. The mine has one of the longest tunnels in the camp. George W. Keel, the manager, has been appointed receiver.

Centennial Emma.—This property, adjoining the famous Emma Mine, at Alta, is owned by Judge Bennett, William Hatfield and others of Salt Lake. A tunnel begun some time to tap the Emma vein has cut it at 600 ft., and the men are working 6 ft. of ore. Specimens show lead and chloride of silver.

SUMMIT COUNTY.

(From Our Special Correspondent.)

Park City Shipments.—The following are the shipments of ore for the week ending January 18: Ontario, 1,063,450 lbs.; Daly-West, 1,358,850 lbs.; Silver King lease, 73,450; Daly lease, 71,200; Quincy, 832,050; Anchor, ore and concentrates, 323,200; Silver King, ore and concentrates, 1,563,400.

Ontario.—C. L. Rood, the manager, reports the drifts being run east and west on the 1,500-ft. of this Park City have not reached the point where the ore shoot should be encountered.

TOOELE COUNTY.

(From Our Special Correspondent.)

Stockton Shipments.—Following are the shipments for the week ending January 18: Stockton, 1 car ore; Pascoe, slag, 1 car; East Honorine, 1 car ore; Steamboat, 1 car ore; Grand Cross, 1/2 car ore and Ophir Hill, 3 cars of concentrates; total, 7 1/2 cars.

Midas.—This property, near Ibapah, under the management of Fred. Dern, started operations January 20. A. W. Chandler, a graduate of the Colorado School of Mines, is metallurgist.

Overland.—This property, near the Sunshine, at Sunshine, is preparing to resume work.

Sunshine.—The cyanide mill on this property at Sunshine, has been closed several years. A new invention by George Moore, was lately placed in the mill with tanks for treating the prepared material. An immense body of \$5 and \$6 ore is reported exposed in the new workings.

UTAH COUNTY.

(From Our Special Correspondent.)

Summit Placer Mining Company.—The albertite and oocerite deposits between Colton and Soldier Summit, owned by this company, are managed by Col. A. B. Carrier, formerly of Buffalo, N. Y. The property is developed by a shaft 150 ft. deep with stations at 40, 60 and 100 ft., each having drifts of about 100 ft. The vein is regular and averages 3 ft. Six men are at work under R. J. Krupa, superintendent. During 1901 C. H. Higgins, owning similar deposits near by, shipped to St. Louis 2 1/2 tons of material. Other shipments were made by N. Robinson and W. L. Richardson.

WASATCH COUNTY.

(From Our Special Correspondent.)

Raven Mining Company.—This producer of elaterite, shipped, by the way of Price, to Chicago, 125 tons in December, 1901. The company expects to ship regularly 2 cars a week during 1902.

WASHINGTON.

FERRY COUNTY.—REPUBLIC.

(From Our Special Correspondent.)

The camp has been very dull for some time, but conditions are improving with the approach of the railroads. The Washington & Great Northern, and the Grand Forks & Republic are both rushing work and fighting in the courts for advantages, and about the rights of way up Eureka Gulch. Each company's aim appears to delay the other, in order to get its line finished first and secure the ore carrying contracts. Some of the principal mines are still idle.

California.—Teams are hauling first-class ore to Curlew to await railroad transportation to the Granby Smelter, at Grand Forks, B. C.

El Caliph.—The new lessees are getting out a little ore from the bottom of the slope.

Hawkeye.—A 12 h. p. gasoline engine is being installed. The shaft is down over 200 ft. At 240 ft. the next station will be cut out.

Republic Consolidated.—It is reported that \$68,000 out of the \$75,000 of the bonds to be sold for exploring the mine upon lower levels have been subscribed for.

Trade Dollar.—Fifteen men are employed on 2 shifts—day and night—on the 200-ft. level. The south drift has 88 ft. to run to the Ben Hur north line. For 40 ft. it has shown pay ore, some of which carries visible gold.

Valley Gold Mining Company.—At the recent annual meeting at Republic, Wash., the directors elected were John Stack, F. O. Birney, W. G. C. Lanskaill, D. F. Hallahan and J. W. McCann. John Stack was elected president, F. O. Birney, vice-president, and W. G. C. Lanskaill, secretary and treasurer.

FOREIGN MINING NEWS.

AFRICA.

TRANSVAAL.

Langlaagte Deep.—This mine is added to the producing list on the Witwatersrand, the mill having started up January 6, with 50 stamps running.

Robinson Gold Mining Company.—This company's detailed report for the month of November shows 500 ft. of development work done. The quartz taken out was 10,884 tons, of which 2,782 tons was sorted out as waste, leaving 8,102 tons of ore. The ore sent to mill and crushed was 7,702 tons. In the mill 60 stamps were run 28 days, the average work being 4.6 tons per stamp per day. In the cyanide plant 6,290 tons of tailings were treated. No slimes nor concentrates were treated during the month. The returns were, in fine gold: From mill, 4,710 oz.; from tailings, 1,234 oz.; total, 5,944 oz., an average of 0.77 oz. per ton crushed. The profit for the month was £17,212. The averages per ton, reduced to United States currency were: Gold saved, \$14.59; interest, etc., \$0.32; total, receipts, \$14.91. The expenses were mining, \$2.19; milling and concentrating, \$1.01; cyanide works, \$0.59; maintenance and general, \$0.57; development, \$0.83; total, \$5.19. The profit was \$9.72 per ton.

ASIA.

INDIA—MYSORE.

Kolar Goldfield.—The output of gold from the mines of this district for December was reported at 43,069 oz., crude, which is an increase of 1,400 over November, but a decrease of 628 oz. as compared with December, 1900. The total for the year 1901 was 504,348 oz. crude, against 495,030 oz. in 1900, showing an increase last year of 9,318 oz. The production for 1901 was equal to 453,913 oz. of fine gold, or \$9,382,382. The production of the leading mines for December is reported as follows: Mysore, 14,059 oz.; Champion Reef, 13,468 oz.; Ooregum, 7,310 oz.; Nundydroog, 4,863 oz.; Balaghat, 2,378 oz.

CANADA.

ALBERTA.

Frank Coal Mines.—The main entry at Frank is in 1,800 ft. and is reported to show 11 ft. of clean coal. A cable haulage plant will probably be installed before long to replace the horses now used. The vein is from 10 to 20 ft. thick and nearly vertical between walls of hard sandstone. The mine is reported free from gas. A new entry is to be opened farther up the hill.

BRITISH COLUMBIA—BOUNDARY DISTRICT.

British Columbia Copper Company.—It is stated that this company's smelter on a recent 24-hour run smelted 460 tons of ore in its furnace which has a nominal capacity of 250 tons.

MINING STOCKS.

Complete quotations will be found on pages 158 and 159 of mining stocks listed and dealt in at:

Boston.	Salt Lake City.	Toronto.
Colo. Springs.	Spokane.	Mexico.
New York.	St. Louis.	Paris.
Philadelphia.	London.	
San Francisco.	Montreal.	

New York. Jan. 23.

The bears are manipulating the copper shares and Amalgamated hovers around \$69 and Anaconda about \$31. On curb traders aroused interest in Greene Consolidated, of Mexico, at \$29 3-4@30 1-2. Tennessee was moderately traded in at \$13 5-8.

Quicksilver common, of California, is stationary at \$4 on sales.

Ontario Silver, of Utah, is again turning on an \$8 pivot, selling \$8.37 1-2, owing to the weakness of the metal.

A little more has been done in the Colorado section, though public interest is still lacking. Sales of Elkton Consolidated, of Cripple Creek, were made at the decline, \$1.14; Isabella at 29@30c.; Jack Pot at 35@34c. and Anaconda at 25@24c. Small Hopes, of Leadville, reappeared with sales at 40c., and Iron Silver at 65c.

The Comstock stocks were weak. Consolidated California & Virginia went at \$1.40@1.35, Ophir at \$7@9c., and Mexican at 33c.

Auction sales were the following in a lot with other securities at \$31: 2,000 shares Phoenix Mining Company, par value \$100 each; 1,000 shares Oriental Gold Mining Company, par value \$25 each; 1,000 shares Miller Gold Mining Company, par value \$25 each; 150 shares State Line Consolidated Gold Mining Company of New York, par value \$1 each; 100 shares Mono Gold Mining Company, par value \$100 each; 500 shares Central Arizona Mining Company, par value \$10 each; 300 shares Amie Consolidated Mining Company, par value \$10 each; 200 shares Silver Cliff Mining Company, \$50 each; 10 shares New York Copper Manufacturing Company, par value \$100 each; 50 shares Bechtel Consolidated Mining Company, par value \$100 each, and 2,500 shares Prospectors' Mining and Developing Company, par value \$5 each. There were also sold at auction 100 shares Vulcan Metal Refining Company, of Sewaren, N. J., (ex-January dividend), \$100 par, at \$140 1-4, and 300 shares Playa de Oro Mining Company (trust certificates), \$100 par, at \$1 per share.

Boston. Jan. 22.

(From Our Special Correspondent.)

The South Range group of mines furnished the excitement in this market during the week; sharp advances were scored and almost as sharp declines followed. The activity in these stocks stimulated some trading in other copper shares, but it is proven to the satisfaction of all that the public is taking no interest in the copper share market. It is a case of insiders working market prices up and adding to their already large holdings of stocks. This sort of thing can be done at most any time, as the insiders and pools have the stocks. If the copper war should be settled, no doubt the public would be inclined to take hold, but at present there is nothing to tempt them.

Trimountain again led in point of activity and advance, largely through Lawson's tip and manipulation. The price reached \$59 Monday, with a \$2 assessment paid. January 11 the stock sold at \$39, showing an advance of \$20 in nine days. The stock settled to \$57 1-2 to-night with less activity. In a statement Lawson claims that he and A. C. Burrage own 68,800 of the 100,000 shares at a cost of \$45 1-2 per share. The public has the balance and his purpose is to educate the public to the merits of this property. Reports from the Lake state that the rock has been running 2 per cent mineral. The company is building a mill, but at present is using one head of stamps at the Arcadian Mill. It is suspected that, although the public may be getting an education, it refrains from loading up with the stock.

Copper Range and Baltic have also been active stocks. In each case but very few shares remain out, as under the consolidation the stocks were practically all deposited. Trust receipts were issued, however, and these make a good delivery. Copper Range advanced 7 points to \$59 during the week, with reaction to \$52 again, and Baltic \$7 3-4 to \$39 3-4, with subsequent reaction to \$34. It is said that a large holder of Baltic has liquidated at the advance, the stock coming from Detroit. It is hinted that Trimountain may go into the Copper Range deal, which is the cause for the activity. The boom in these stocks seems to have come to an abrupt end.

Dominion Coal and Dominion Iron and Steel securities have also been prominent features. The former has advanced \$6 this week and the latter \$3 3-4. Both stocks have been purchased for Montreal account, where control of each now rests. Mr. Henry M. Whitney was the original promoter of each company, but he has sold his holdings to the Canadian interests and is taking a trip abroad. Dominion Iron

and Steel, which is not listed here, has advanced several points in Montreal to \$85, and the bonds are quoted at \$83. Dominion Coal 6 per cent bonds sell at \$111 and the preferred is \$118 bid. The latter is a 7 per cent, cumulative stock.

The decline of Cochiti Gold Mining to \$1 1-4 is noteworthy, as this is its lowest price. Liquidation of tired holders is the cause, together with the fact that there is no encouraging news from the mine. Mass Mining and Mohawk both enjoyed fair recoveries, but yielded somewhat. Old Dominion stockholders may take steps to investigate the management, as it is thought there is "a nigger in the wood-pile" somewhere. Guanajuato slid off to \$4, but recovered to \$4 1-2. Montreal & Boston has been active, but at a fractional sacrifice to the price.

Salt Lake City. Jan. 18.

(From Our Special Correspondent.)

The principal mining stocks dealt in during the week ending January 18 were Ajax, Carisa, Consolidated Mercur, Daly-West, May Day, Star Consolidated, Uncle Sam, California, Century and Yankee Consolidated. A total of 511,920 shares were dealt in which realized \$286,619.

The Consolidated Mercur Company met in regular session on January 15, but immediately adjourned until January 24.

Centennial Eureka paid a quarterly dividend of 50c. a share or \$50,000, which was for the last quarter of 1901. This was paid January 10.

The Century Mining Company decided at a meeting, held January 11, to assess the stock 10c. per share or \$15,000. The assessment is delinquent February 11. All stock with unpaid assessments will be sold March 15.

San Francisco. Jan. 18.

(From Our Special Correspondent.)

Stocks have been firmer and more active, with one or two exceptions. The feature of the week was a sharp rise in Hale & Norcross, on reports of favorable indications in the new works.

Consolidated California & Virginia was quoted at \$1.55; Ophir, 85c.; Hale & Norcross, 42c.; Mexican, 35c.; Postosi, 19@20c. Most of the North End stocks were stronger.

The sworn monthly statements filed in the offices of the companies show cash on hand January 1 as follows: Andes, \$58; Alta, \$81, with liabilities of \$3,304; Alpha Consolidated, \$85; Belcher, \$442, with liabilities of \$6,000; Bullion, \$2,081; Caledonia, \$9,432, with December mine expenses unpaid; Consolidated California & Virginia, \$51,144, with clean-up of concentrates to be received; Best & Belcher, \$1,497, with indebtedness of \$1,500; Chollar, \$536, with indebtedness of \$1,000; Confidence, \$3,349, with December expenses unpaid; Consolidated Imperial, \$1,351; Challenge Consolidated, \$491; Crown Point, \$170, with December expenses unpaid; Gould & Curry, \$224, with liabilities of \$14,725; Hale & Norcross, \$2,730; Justice, \$1,620, with liabilities of \$6,621; Mexican, \$3,846; Ophir, \$7,806; Overman, \$1,523, with December expenses unpaid; Potosi, \$1,022, with indebtedness of \$1,000; Savage, \$440; Segregated Belcher, \$390; Sierra Nevada, \$5,324; Silver Hill, \$9,308; Standard Consolidated, \$126,693, with December expenses and December clean-up of bullion to be accounted for; Syndicate, \$3,472; Union Consolidated, \$1,305; Utah Consolidated, \$42.

The following companies in the above list are now collecting assessments: Andes, Alpha, Best & Belcher, Chollar, Challenge, Crown Point, Gould & Curry, Hale & Norcross, Ophir, Overman, Potosi, Savage, Segregated Belcher and Union Consolidated.

On the San Francisco Oil Exchange business was not very heavy, and prices were a little weaker. Peerless sold at \$6; Home, \$3.70; Kern, \$5.25@5.50; California Standard, 25c.; Oil City, 21c.; Superior, 6c.; Petroleum Center, 5c. The low-priced stocks were the favorites.

London. Jan. 10.

(From Our Special Correspondent.)

During the past week or two there has been considerable activity in various sections of the mining market. The public are now taking an interest in South African shares of all sorts and are buying for rises. At the time of writing there happens to be some dullness owing to many professional holders being too desirous of selling out at a profit, but this depression is only temporary. The shares in deep level mines are in demand owing to the publication of the result of the second borehole on the Turf Club Estate, where the reef has been struck at a depth of 4,750 ft. Low priced speculative gold shares are also in demand. Attention has been turned to Chartered (British South Africa Company) shares and at one time the quotation rose to over £4. Some sensation was caused one day by the circulation of a rumor that Lord Milner had been killed, but this was so obviously a bear dodge that it had little effect.

There has also been some speculative activity in West Africans and in West Australians. Among the latter Great Fingall continues to be most prominent.

The market for shares in the Whitaker Wright

group continues to be very shaky and very careful handling will be required in liquidation so as to realize reasonably. The shares in the Le Roi are still disturbed by Mr. Frecheville's report, and there is every expectation that things will not settle down for some time. Mr. Macdonald is in this country at present and has already expressed himself as differing from Mr. Frecheville in many important points. I understand that he is preparing a detailed statement controverting Mr. Frecheville's expressions of opinion. The Le Roi No. 2 Company has passed into the control or at least the direction of different people from Le Roi and Mr. Macdonald's services have been retained by them, the chairman expressing the opinion that Mr. Macdonald was the ablest mine manager in Canada. It is probable that there will be a Frecheville-Macdonald controversy for some time if not to unsettle the market, at any rate to amuse it.

The report just issued of the Avino Mines of Mexico, Ltd., which works the mines of that name in Durango, Mexico, discloses a remarkable state of things. The ore is a mixture of lead and copper sulphides containing silver and some gold, and when the properties were acquired by the English company, of which Mr. Frank Gardner is the leading spirit, an extensive concentration plant was erected and the mine was developed on a large scale. This plant was described and illustrated in the ENGINEERING AND MINING JOURNAL in March, 1900, from information supplied by those interested, but it now appears that even at that time it had become evident that the ore was not compatible to treatment by the plant. It has since been ascertained definitely that the extractions are only 30 per cent of the silver, 20 per cent of the copper and 40 per cent of the lead. Efforts have since been made to treat the ore by matte smelting, but the cost of coke is prohibitory and there is no suitable flux in the neighborhood. The directors are very desirous of concealing the names of the people responsible for these blunders, but I may mention that in the above named article Mr. A. A. Blow was stated to be the consulting engineer. The company has now consulted Mr. Ottokar Hofmann, and he has recommended chloridizing roasting and lixiviation as being the right process for this class of ore and as there is no better authority on this subject than Mr. Hofmann, the adoption of his suggestions and designs should bring the company to prosperity. In the meantime shareholders are extremely indignant and many want to clear out.

DIVIDENDS.

Name of Company.	—Latest Dividend—			Total to Date.
	Per Date.	Per Share.	Total.	
†Alaska Treadwell.....	Jan. 28	.37½	75,000	\$4,895,000
†Amalgamated Copper.....	Jan. 27	\$1.00	\$1,538,379	\$17,348,307
Cal. & Hecla Copper.....	Jan. 29	.10	1,000,000	78,350,000
Cambria Steel, Pa.....	Feb. 15	.75	750,000	4,500,000
†Cent'l Eureka, Utah.....	Jan. 10	.50	50,000	2,667,700
†Central Oil, Cal.....	Jan. 25	.03	24,000	160,247
†Colo. Fuel & I., pf.....	Feb. 20	4.00	80,000	1,400,000
Consolidation Coal.....	Feb. 1	2.00	205,000	5,523,000
Four Oil, Cal.....	Jan. 15	.01	3,000	18,000
Goodenough, B. C.....	Jan. 25	.01	10,000	45,000
*Gold Coin, Colo.....	Jan. 25	.03	30,000	990,000
*Helena, Oregon.....	Jan. 25	.00½	6,000	122,500
*Home Oil, Cal.....	Jan. 21	.07½	7,500	267,500
†Homestake, extra.....	Jan. 25	.25	52,500	1,388,660
†Homestake, S. Dak.....	Jan. 25	.25	52,500	10,768,750
†Hong, R. Cn. C. & I. pf.....	Jan. 15	1.75	347,165	1,388,660
*New Zealand, Colo.....	Jan. 25	.01	7,650	53,550
*N. Y. & Hond. Rosario.....	Jan. 25	.10	15,000	1,685,000
†Parrot, Mont.....	Jan. 27	.50	114,925	5,772,925
†Pittsburg Coal, pf.....	Jan. 25	1.75	560,000	4,718,168
Rambler-Cariboo, B. C.....	Jan. 25	.01	12,500	142,500
*Rocco Homestake, Nev.....	Jan. 10	.01½	4,500	58,500
San Joaquin Oil, Cal.....	Jan. 25	.10	10,000	30,000
Standard, Idaho.....	Jan. 25	.05	25,000	2,450,000
Standard, Cal.....	Feb. 10	.10	17,839	4,053,297
†Stratton's Independence.....	Jan. 23	.24	240,001	3,792,857
†Susq. I. & St.....	Jan. 27	.15	45,000	627,500
†Tenn. C. I. & R. R., pf.....	Feb. 1	2.00	4,000	267,840
†Texas & Pac. Coal.....	Jan. 25	1.50	30,000	1,950,000
†U. S. Steel, com.....	Mar. 21	1.00	5,084,350	15,227,812
†U. S. Steel, pf.....	Feb. 13	1.75	8,927,933	26,752,894
†Vindicator, Colo.....	Jan. 25	.03	35,000	782,000
Vindicator, extra.....	Jan. 25	.05	55,000	.....

*Monthly. †Quarterly. \$Semi-annual.

ASSESSMENTS.

Name of Company.	Location.	No. Delinq.	Sale.	Amt.
Alpha Con.....	Nev.	Jan. 30		
App. Con.....	Cal.	1 Feb. 6 Mar.	5	1.00
Century.....	Utah	Feb. 11		.10
Chollar.....	Nev.	Jan. 17 Feb. 12		.05
Comstock.....	Utah	Jan. 20 Feb. 8		.10
Crown Point.....	Nev.	Jan. 2 Jan. 28		.05
Dudley.....	Cal.	13 Jan. 13 Feb. 4		.02
East Honerine.....	Utah	1 Feb. 12 Feb. 28		.00½
Garibaldi.....	Cal.	1 Jan. 21 Feb. 15		.01½
Gould & Curry.....	Nev.	Feb. 2 Feb. 24		.10
Hale & Norcross.....	Nev.	Jan. 7 Jan. 28		.10
Inyo Marble.....	Cal.	35 Jan. 15 Feb. 10		.05
Jefferson.....	Utah	4 Jan. 13 Feb. 1		.00½
Julia Con.....	Nev.	Jan. 17 Feb. 12		.03
Maple.....	Utah	4 Jan. 15 Feb. 5		.00½
Marina Marsicano.....	Cal.	26 Jan. 6 Jan. 27		.04
Mohican.....	Cal.	2 Jan. 4 Feb. 3		.05
Orleans Con.....	Cal.	1 Dec. 28 Jan. 30		.02
Potosi.....	Nev.	61 Jan. 6 Jan. 28		.20
Reward.....	Cal.	Feb. 8		.03
Sallor Con.....	Cal.	14 Jan. 17 Feb. 7		.01
Savage.....	Nev.	Feb. 2 Feb. 27		.05
Sez, Belcher & Mides Con.....	Nev.	Jan. 6 Jan. 27		.03
Tintic Copper King.....	Utah	Feb. 5 Mar. 5		.00½
Union Con.....	Nev.	Jan. 31 Feb. 24		.10
Yuba Con.....	Cal.	5 Jan. 27 Feb. 17		.03

Paris. Jan. 12.

(From Our Special Correspondent.)

The slight improvement which was apparent after the opening of the year has passed over, and matters are very quiet in the mining stock section of the Bourse. The only fluctuations which are of special interest are in the South African gold stocks, which are showing a tendency to improvement. They are still regarded with some doubt, however, by our people, who are not so optimistic about the conclusion of the war as they are in London.

The stockholders of the French Rand Gold Mining Company will hold a meeting at Johannesburg on February 28, to vote on a proposal to reduce the capital from 14,000,000 fr. to 7,000,000 fr. by the surrender of one half the present shares. It is then proposed to issue 214,000 new shares of 25 fr. par value for the purpose of raising the capital required to restore the mill and mine to a proper condition and to resume work. The new shares will be offered to present stockholders at a price of 43.75 fr. each. It is announced that the total issue has been underwritten.

The foreign merchandise trade of France for the 11 months ending November 30 is reported by the Ministry of Commerce as below:

	1900.	1901.
Imports	Fr. 4,261,688,000	Fr. 4,302,164,000
Exports	3,720,634,000	3,814,625,000
Excess, imports	541,054,000	487,539,000

The imports increased this year 40,476,000 fr., and the exports 93,991,000 fr.; leaving a decrease of 53,515,000 fr. in the excess of imports. The total imports of gold and silver in 1901 were 443,601,000 fr., against 529,905,000 fr. in 1900; while the exports in 1901 were 268,183,000 fr., against 290,477,000 fr. in the previous year.

AZOTE.

COAL TRADE REVIEW.

New York. Jan. 24.

ANTHRACITE.

The demand for anthracite coal continues good in all consuming territories. The mines in the Schuylkill and Lehigh region have about recovered from the December floods; production is active and a heavy tonnage is going forward. Practically none of the coal mined is being stored by the large companies and prices remain very firm. In the Northwest car-supply has improved a little, facilitating the movement of coal from the docks, and while buying is seasonably active there is no pressure on dealers. In Chicago territory dock coal is in good supply, but rail coal receipts are still not as heavy as desired. Here, as at points farther east, chestnut is the size most wanted. Along the lower lakes and in Canadian territory coal is arriving more freely, but demand is very active, and dealers often find it difficult to fill orders promptly. There is a good demand in the line trade farther east. Along the Atlantic seaboard buying continues remarkably active for this season of the year, and the market is strong. The steam sizes, owing to the short supply of bituminous coal, are in short supply and hard to get for prompt delivery. While nominally prices are unchanged we know of concerns that have paid as high as \$3.50 for pea coal f. o. b. New York Harbor. The present outlook does not favor much improvement in the situation and prices for steam sizes will undoubtedly remain high until spring.

There have been no changes at Eastern points in wholesale prices for prepared sizes and we continue to quote as follows for free-burning white ash coal, f. o. b. New York Harbor shipping ports: Broken, \$4; egg, \$4.25; stove and nut, \$4.50. Pea is nominally \$3; buckwheat, \$2.50.

BITUMINOUS.

In the Atlantic seaboard soft coal trade the railroads two weeks ago pushed all loaded cars to tide-water and then gave a fair supply of empties at the mines for about a week. This permitted liberal enough shipments to take the edge off of some acute conditions. Now, however, car supply has fallen off again and producers are receiving less than 50 per cent of the total number they ask for. As a result, the market is once more short of coal. The lateness of the season will probably reduce the demand for deliveries and the situation will therefore improve even though car supply gets no better. If present conditions should prevail into March they would have a very beneficial effect on contract business, but it looks now as though conditions would not prevail when most desired by producers. Regarding the new season's business a variety of opinions is expressed, both higher and lower prices being prophesied. A little coal has been taken at association prices; some of this at mine prices, so that any new figures on freights named by the railroads may not affect producers. At present the lower grades of coal are in much better supply than the high grades.

In the far East there is demand for considerable

coal, but it is thought the market there is under no great pressure, as receipts are fairly liberal. Along the Sound the most urgent needs have diminished, with freer arrivals, but the trade still calls for more coal than producers can supply. At New York Harbor the variations in tide-water receipts are shown by the fluctuations of prices during the past two weeks. Clearfield has sold at \$3.50@3.75; then prices fell to \$2.60@2.85, and are now up to \$2.75@2.85. The best grades of coal are not procurable for prompt delivery. In the all-rail trade consumers are not getting all the coal they want and some are in a bad way, being obliged to use pea or anything they can get.

Transportation from the mines to tide-water is variable. Car supply at the mines is below 50 per cent. In the coastwise vessel market vessels are in better supply, and rates are a little easier. We quote current rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound, \$1; Boston, Salem and Portland, \$1.15; Portsmouth, \$1.20. Rates from the Chesapeake Bay ports are quoted the same as from Philadelphia.

Birmingham. Jan. 20.

(From Our Special Correspondent.)

The railroads while furnishing more cars than a short time ago, are still unable to meet all demands. The shipments of coal down the Mississippi River keep up well and contracts have been placed for a larger amount this year than went down the stream last year. The demand for Alabama coal from Louisiana and lower Mississippi is reported growing.

Fairly good prices obtain. The miners are working well, the maximum wage scale being in effect.

Chicago. Jan. 21.

(From Our Special Correspondent.)

The demand for anthracite is strong. Local dealers are almost out of chestnut and are short of stove. There has been no change in the price this week.

So far as soft coal is concerned, local dealers have only the railroad situation to worry them and car supply has improved. The scarcity of water in Southern Illinois has made washed coal scarcer. Indiana lump, car load lots, is quoted at \$2.10 and \$2.25 Chicago; Indiana block at \$2.25 and \$2.35. Illinois coal, Carterville, washed, is quoted at \$1.75 and \$2.25; Danville coal, lump \$2.10 and nut \$2.00.

The Spaulding Coal Company and the Clear Lake Co-operative Coal Company have combined. The new company is known as the Spaulding Coal Company, Incorporated, and will control property worth \$100,000. The average daily output of the two mines ranges from 1,200 to 1,400 tons.

The coke situation is still bad, and foundries are running on the ragged edge. Nominally, coke is worth \$5.50 Chicago, but for immediate delivery the price is \$6@8.25.

Cleveland. Jan. 22.

(From Our Special Correspondent.)

The coal trade has felt very materially the relief in the railroad situation. The car supply has not been added to in any very marked degree, yet cars are very much easier to obtain now because of the better dispatch in loading and unloading. The key to the situation seems to have been the possession—or lack of it—of motive power. The railroads have been receiving installments of locomotives lately in such quantities as to make it possible to move the loaded cars and relieve the yards and sidings. This seems to have been the main relief which the coal shippers have been waiting for and now the domestic supply of coal is coming forward in adequate quantities. It is even possible that some of the dealers are being able to collect stocks against another rush, although consumption seems now to be up to the top notch. The prices have not changed in the least.

Some of the shippers are beginning to figure on possible all-rail shipments to the Northwest. A Duluth consignee was in the city a few days ago and said that no stock piles there are lower than they have been for years and according to his statement the supply will not be equal to the winter demand. Some of the shippers therefore are planning to send coal forward by all-rail. This presages a very heavy lake movement early in the season and the expectations are that the coming season of navigation will see one of the biggest movements of coal ever witnessed on the lakes. There is no talk indulged in yet as to the possible season rate of carriage.

Pittsburg. Jan. 22.

(From Our Special Correspondent.)

Coal.—Trade continues in excellent condition and prices are being well maintained. The coal miners' district convention closed on Saturday after deciding to urge some important changes in the scale for the year beginning April 1. Forty-two delegates went from this district to the national convention which opened on Monday in Indianapolis instructed to advocate the recommendations made. Among them is a demand for a single standard run-of-mine system with

an advance of 10c. a ton above the present rate. For machine mining it is recommended that the rate be changed to three-fifths of the pick mining price instead of one-half as at present. It was also decided to insist on the establishment of the check-off system at all mines. This system provides for the deduction by the operation from the miners' pay all dues and assessments that may be levied by the United Mine Workers of America. It is generally conceded that if these terms are insisted upon that there will be no settlement of the scale when the joint conference with the operators convenes at the close of the miners' convention. The operators will demand a double standard and will positively refuse to grant any advance over the present high scale. It is reported that a reduction is likely to be proposed by the operators.

Connellsville Coke.—The Pennsylvania Railroad has increased its motive power in the coke trade by leasing 50 locomotives from the Duluth & Iron Range Railroad. Shipments were largely increased last week and furnaces are now receiving nearly all the coke they require. Prices remain at \$2.25 for furnace and \$2.75@3 for foundry coke. The production was 206,545 tons. The *Connellsville Courier* reports shipments for the week aggregated 11,181 cars distributed as follows: To Pittsburg and river tipples, 3,194 cars; to points west of Pittsburg, 5,769 cars; to points east of Connellsville, 2,218 cars. This was an increase of 1,241 cars compared with the shipments of the previous week.

Foreign Coal Trade.

There is little new to report in coal exports at the present time. Conditions remain about the same as at our last report.

Exports of fuel from Great Britain for the year ending December 31 are reported as below, in long tons:

	1900.	1901.	Changes.
Coal	41,878,345	.....	.....
Coke	808,061	.....	.....
Briquettes	1,080,146	.....	.....
Total	46,088,228	43,766,552 D.	2,331,676

In 1900 coke and briquettes were not reported separately. Shipments of coal for the use of ships engaged in foreign trade were 13,586,833 tons in 1901, against 11,752,316 tons in 1900, showing an increase of 1,834,517 tons.

The British admiralty has placed orders at Cardiff for about 600,000 tons of steam coal to meet the requirements of the navy during the current year. The contracts include a larger quantity of seconds and small coal than heretofore. The contract price ranges from \$3.30 to \$3.50 per ton on wharf at Cardiff. This is a reduction of over 30 per cent from the contract rates for 1900.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of January 11, that at Cardiff the tone of the Welsh coal market, both for Cardiff and Monmouthshire descriptions, is considerably easier. Quotations are: Best Welsh steam coal, \$3.84@3.96; seconds, \$3.72; thirds, \$3.60; dry coal, \$3.72; best Monmouthshire, \$3.66@3.78; seconds, \$3.36; best small steam coal, \$2.58; seconds, \$2.16; other sorts, \$2.04.

The above price for Cardiff coals are all f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f. o. b. Newport, exclusive of wharfage, but inclusive of export duty, and are for cash in 30 days, less 2 1-2 per cent discount.

The freight market is again very active and a large amount of chartering has been done; rates of freight, however, remain practically unchanged. Some rates from Cardiff are: Algiers, \$1.30; Marseilles, \$1.35; Genoa, \$1.29; Naples, \$1.32; Port Said, \$1.26; Singapore, \$2.82; Las Palmas, \$1.44; St. Vincent, \$1.02; Rio Janeiro, \$2.64; Santos, \$2.94; Buenos Ayres, \$2.34.

IRON MARKET REVIEW.

NEW YORK, Jan. 23.

The principal feature of the iron market during the past week has been some heavy buying of pig iron for delivery during the third and fourth quarter of the year. While there is little change of prices on these long contracts some high figures have been paid for iron for early delivery in cases where the purchasers were in need of supplies. A peculiar feature was the sale of a large lot of Southern basic iron for delivery in the Pittsburg District at a price about \$1 a ton above the current quotation for bessemer pig. This is a reversal of the usual conditions, as bessemer generally brings from 50c. to \$1 more than basic iron. Foundry iron is in very good demand and there seems to be a scarcity of certain grades. A rumor has been current this week that some German basic pig has been offered for early delivery, but it cannot be substantiated. It hardly appears probable, as German makers would naturally prefer to sell billets, as they have been doing recently.

In finished material the demand for structural steel continues large. Builders in the cities are beginning

to put in their orders for the coming season and it is understood that the American Bridge Company has some large requirements still to be filled. The car-builders and locomotive men are looking out for material also, and some good transactions in plates and bars are noted.

In view of the fact that the rail mills are all filled up for the current year, it is not surprising that an order for 35,000 tons for the Mexican Central should have gone to foreign makers. None of our mills would undertake to make deliveries as early as the company needed them.

The railroad transportation conditions are very much improved and deliveries both of finished material from the mills and the fuel and ore to the furnaces are being promptly made. In addition to its new equipment, the Pennsylvania Railroad Company has leased a number of locomotives from the Minnesota ore carrying roads which were laid up for the winter. These will help the company until spring, when more of the new engines now under construction will be ready.

Imports of pig iron into Great Britain for the year 1901 were 198,560 tons, of which 35,372 tons were from the United States. In 1900 the total imports were 181,151 tons, of which 94,282 tons came from the United States. The largest imports last year were from Germany.

Birmingham. Jan. 21.

(From Our Special Correspondent.)

The demand for pig is firm, and quotations are inclining to another advance. The furnacemen are pleased, and are making efforts to hold prices. There is an excellent inquiry, and furnaces should be active for the first half of the year at least. Some inquiry is being made as to iron for delivery in the Fall. The railroads are still slow in furnishing cars, but with the delay there is much iron going out.

The basis for pig iron is still \$11.50 for No. 2, foundry, though there is mention of a \$12 rate. The demand is for all grades and production is holding its own. The report of the Southern Iron Committee for December shows that the total shipments from Alabama and Tennessee amounted to 130,599 tons, of which 122,347 tons were pig iron and steel, and 8,252 tons were cast iron pipe. The shipments for the entire year, 1901, from the 2 States amounted to 1,685,674 tons, of which 1,527,079 tons were pig iron and steel, 158,595 cast iron pipe. The exports amounted to 21,810 tons. Export cast iron pipe shipments amounted to 2,787 tons. During 1900, shipments of pig iron and cast iron pipe from Alabama and Tennessee amounted to 1,416,691 tons, of which 1,327,741 tons were pig iron and 88,950 tons cast iron pipe. From the Birmingham district alone during 1901, the total shipments of pig iron, steel and cast iron pipe amounted to 869,651 tons, against 847,086 tons in 1900. There were 791,517 tons of pig and 78,134 tons of cast iron pipe shipped from the district, against 817,972 tons pig and 29,114 tons cast iron pipe in 1900. The export iron movements in 1901 from the district amounted to only 20,287 tons against 238,615 tons in 1900, and cast iron pipe exports, 1,455 against 9,700 tons.

The following quotations are given: No. 1, foundry, \$12 and \$12.50; No. 2, \$11.50 to \$12; No. 3, \$11; No. 4, \$10.50 to \$11; gray forge, \$10 to \$10.25; No. 1, soft, \$12 to \$12.50; No. 2, \$11.50 to \$12.

The steel market is quite active. As soon as the adjustments are made the steel rail mill will start steady operations. The plant of the Alabama Steel and Wire Company is in strong operation with the nail and wire departments working nights. There is a little scarcity of labor or the rod mill would run through the night also.

Orders placed for railroad cars with the Southern Car and Foundry Company will throw some handsome orders to the mills and the car wheel works. The company during the week received one order for more than \$1,250,000 worth of box, coal and flat cars from the Cincinnati Southern Railroad.

Foundries and machine shops are well supplied with work.

The resignation of Mr. John Dowling, who has been superintendent of the Bessemer Division of the Tennessee Coal, Iron and Railroad Company for several years, was announced last week.

Buffalo. Jan. 22.

(Special Report of Rogers, Brown & Co.)

The pig iron market is now being tested. All the pressure of the duller season of the year, together with the pessimistic sentiment always waiting for an entrance in January and February is now to determine the sort of foundation supporting the market. If it transpires that there has been no overbuying and that consumers really need so much iron as they profess then even greater strength may be looked for soon. Producers are absolutely indifferent as to the result of the test. They are too much occupied in whittling down the orders already entered to care about the immediate future of the market. Buyers whose requirements are not covered are the closest

students of the situation. In the meantime orders ranging from 100 to 1,000 tons, and even 10,000 tons, are noted. We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$17.25; No. 2, \$16.75; Southern soft No. 1, \$17; No. 2, \$16.50; Lake Superior charcoal, \$19.50.

Chicago. Jan. 21.

(From Our Special Correspondent.)

Large consumers are inquiring about iron for the last six months of the year, and there is buying. Mild weather has aided the railroads, to some extent, and the movement of cars has been freer than for many weeks back. The temporary improvement in shipping coke permitted the Illinois Steel Company to start up 2 of the 7 stacks which had been banked for some time.

There is fair activity in pig iron, although the majority of consumers have covered for the first half of the year. Prices are strong, with tendency to advance, and premiums are paid for immediate delivery.

There has been an advance of 50 cents a ton on all grades. No. 2 Southern foundry is selling for \$15.65 Chicago, and No. 2 Northern foundry for \$16.50. It is reported here that the Southern pig iron output is practically all sold up to July. Charcoal iron is at least \$1 a ton higher.

Cleveland. Jan. 22.

(From Our Special Correspondent.)

Iron Ore.—Another conference of iron men will be held in this city either the latter part of this week or the first of next to take some action upon the question of establishing higher season's prices on the ores other than the old range bessemer product. It is now expected that there will be a general advance of 50c. a ton. The proposition to advance prices will, if it is adopted, require that many of the producers scale down their estimates of production this year that the ore shall not be a glut on the market. The estimates of all companies now indicate that the production during the coming year will be something like 27,000,000 tons. It is considered possible to ship and dispose of 25,000,000 tons. The making of season rates of carriage depends entirely upon the amount of ore to be shipped and the prices fixed at which it shall be sold.

Pig Iron.—The coke supply in the Valleys has eased up to such an extent as to permit almost a general resumption of activity among the blast furnaces. The increased production is not relieving the situation much as pertains to buyers who are now on the market. Many of the furnaces making foundry grades are announcing that their possible output for the first half has been entirely sold up with the possible exception of a few odd lots that are likely to show up by an unexpected spurt among the furnaces. At present car-load and 100-ton lots are very hard to find for quick shipment, or even those which require deliveries in a greater length of time. The prices are \$16.50 and \$16, respectively, on No. 1 and 2. Bessemer iron is not offered very freely, because the United States Steel Corporation has bought up the entire supply for the second quarter at \$15.75 in the Valleys. This quotation is continued on other sales. Basic producers are negotiating for contracts soon to be closed on a basis of \$15.75 in the Valley for the second quarter.

Finished Material.—An unprecedented demand for structural steel has appeared in the last few days and now it is announced by the big companies that deliveries are impossible short of four months and even then the material will be scarce, as contracts already taken have about covered the supply available for the first half. A boom in building has caused this flurry. The price quoted is still 1.70c. Steel plate is also in better demand and the producers are now announcing that their supply of material is being contracted for in quantities that about equal the production. The rush for orders has, therefore, eased up some. Bars are in better demand than they have been for weeks and the market is very strong, although the talk, recently heard, of an increase in price, has died out entirely. Deliveries are not offered now inside of three months. The price quoted is 1.50c. Pittsburgh for iron and bessemer steel bars and 1.60c. Pittsburgh for open-hearth steel bars. Sheets are likewise in very good demand, with prospects ahead for even a better market. The inquiries are beginning now to anticipate the spring trade, with the result that sales are heavier than they have been for weeks. The quotations do not change, being on the basis of 3.35@3.50c. out of store for No. 27 one-pass cold rolled. The usual difference being charged for other grades and also for mill sales. The rail trade is very quiet, but few sales being made.

Old Iron.—The scrap trade has been very active during the week and the demand is good. The dealers are experiencing less difficulty in the movement of their material, because of the relieved conditions upon the railroads, more motive power having recently been received in such quantities as to make possible the movement of the freight presented.

Pittsburg, Jan. 22.

(From Our Special Correspondent.)

The freight congestion which has seriously affected the industries in the Pittsburg District for more than two months has been entirely relieved and conditions in the yards and on all the roads entering the city are again normal. This was due to the extraordinary efforts of the management. Many new cars and a large number of locomotives have been added to the equipment. Official announcement was made to-day by A. B. Starr, general superintendent of freight transportation of the Pennsylvania Lines West, that the company has caught up on all shipments in this district. He adds that these conditions are not due to a falling off in traffic, but on the contrary shipments are gradually increasing. Pittsburg, he says, suffered the worst of any point along the lines during the freight blockade. As a result of the improved situation more coke has been shipped from the Connellsville Region than in any week for over two months and all the furnaces in the valleys and in this district are again in blast. Some are not yet turning out their full capacity, but will be within the next few days. The demand for iron and steel continues heavy and prices are firm. Advances in most lines could be readily obtained, but manufacturers prefer a steady market. It is admitted that bessemer pig iron could be sold at \$18 at the furnaces, but if sales have been made at that price no publicity has been given to the transactions. In some instances sales of small lots for prompt delivery have been made at \$17, but a great deal of iron has been sold for the third quarter at \$1 less. One of the features of the market this week is a sale of southern basic iron for delivery in this district at a trifle higher than sales of some bessemer iron. As a rule, basic iron is quoted at \$1 a ton less than bessemer. This is one indication of the scarcity of bessemer iron for delivery in the first quarter. Another remarkable feature of the market is the sale of foundry No. 2 at practically bessemer prices and in some instances 25c. a ton higher. Gray forge also is higher, although no sales of any consequence have been made for delivery in the second half. Prices of wire rods are gradually being advanced. All sales this week were at \$35 a ton.

Pig Iron.—Sales of bessemer pig iron aggregated about 5,000 tons at \$16.25@16.50, valley furnaces. It is understood that a higher price was received for several small lots. It is reliably reported that 10,000 tons of Southern basic iron were sold in this market at \$17.15. Foundry No. 2 has advanced to \$16.75@17, Pittsburg, and several thousand tons were taken at those rates. Some sales were made for delivery after July 1 at \$16.25. Gray forge continues active and sales amounting to 4,500 tons were made at \$16.25@16.50, Pittsburg.

Steel.—Bessemer steel billets are firm at \$28 and 3,000 tons were sold at that price. An advance is expected. Sheet bars have been advanced to \$33.75 a ton and wire rods are now selling at \$35. The steel plate and steel bar markets are active, but prices are unchanged. Tank plate is still quoted at 1.60c. and bars at 1.50c.

Sheets.—The sheet market is fair and the mills are all busy. Prices are practically unchanged, No. 28 gauge still being quoted at 3.10@3.20c. and galvanized sheets are 70 and 10 and 70 and 5 per cent off. The bi-monthly examination of the sales sheets of the American Sheet Steel Company for November and December, which was made during the week under the Amalgamated Association agreement, showed that the average for Nos. 26, 27 and 28 gauges did not exceed 3c. As this is the base of the wage scale the sheet mill workers will receive no advance for the months of January and February.

Ferro-manganese.—The price of domestic 80 per cent remains at \$52.50 and the foreign product is selling at \$49 to \$50.

New York. Jan. 24.

Pig Iron.—The market is firm, buying is confined to small lots with spot iron hard to get at quoted prices. We quote for tidewater delivery: No. 1X foundry, \$17@17.50; No. 2 X, \$16.25@16.75; No. 2 plain, \$15.75@16.25; gray forge, \$15.15@15.40. For Southern iron on dock, New York, No. 1 foundry, \$16.25@16.50; No. 2, \$15.75@16; No. 3, \$15.25@15.50; No. 4, \$14.75@15; No. 1 soft, \$16.50; No. 2, \$15.75@16.

Bar Iron and Steel.—Buying is still active. Prices are unchanged. We quote 1.58c. for common bars in large lots on dock, refined bars, 1.63@1.68c.; soft steel bars, 1.68c.

Plates.—There is a good steady demand, mostly for small lots. Eastern mills quote for tidewater delivery in car-loads: Tank, 1/4-in. and heavier, 1.78c.; flange, 1.88c.; marine, 1.98c.; universal, 1.78c.

Steel Rails and Rail Fastenings.—Mills are so busy that they are taking no new orders for export. Standard sections are still quoted at \$28 at Eastern mills; light rails at \$28@30, according to weight. Spikes are 1.80c.; splice bars, 1.55c.; bolts, 2.60@2.70c.

Structural Material.—Demand is remarkably good. We quote for large lots at tidewater as follows: Beams, 1.75c.; tees, 1.80c.; angles, 1.75c.

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 160.)

New York. Jan. 24.

So far January has been a good month for nearly all lines of chemicals; prices for manufactured products are generally steady, while raw materials continue high, notably brimstone and nitrate of soda.

Abroad practically the same condition prevails.

The imports of chemicals into the United Kingdom in the years 1901 and 1900 are summarized as below from official returns:

Articles.	1900.	1901.	Changes
Alkali & Bleach, cwts.....	322,056	521,817	I. 199,761
Borax, cwts.....	308,407	309,253	I. 846
Brimstone, cwts.....	450,661	441,725	D. 8,936
Nitrate of Soda, tons.....	141,165	107,108	D. 34,047
Phosphates, tons.....	355,502	254,910	D. 592
Pyrites, tons.....	741,431	653,584	D. 87,847
Salt-peter, cwts.....	252,021	240,455	D. 11,566

The decrease in raw materials in 1901, notably those used in the manufacture of fertilizers, would indicate that the agricultural industry has not been as active as in 1900. The growing imports of heavy chemicals (alkali amounting in 1901 to 264,196 cwts. and bleaching powder to 257,621 cwts.) shows that certain foreign manufacturers are trying hard to beat the British on their own ground. In the past year or so Americans have shipped fairly large quantities of the soda compounds to Great Britain, besides giving attention to Australia and the other British possessions.

The exports from the United Kingdom in 1901 included 3,718,092 cwts. alkali, against 3,655,700 cwts. in 1900; 1,027,022 cwts. bleaching powder, against 1,267,400 cwts. and 36,016 tons copper sulphate, against 42,900 tons in 1900. The shipments of heavy chemicals to the United States have become alarmingly less, owing to the growing home production.

Heavy Chemicals.—Demand is chiefly for forward deliveries. Next fire domestic high-test alkali sold at 80@82 1-2c. per 100 lbs., f. o. b. works, while prompt business has been at 85@87 1-2c. New contracts for 1902 and 1903 high test domestic caustic soda have been done taken at \$1.90@\$1.95 per 100 lbs., f. o. b. works, while immediate shipments are recorded at \$1.95 up, but this trade is comparatively quiet. Bicarb. soda is in better shape, and exporters also discern an improvement; prices for ordinary are \$1@1.05 per 100 lbs. f. o. b. works, and for extra grades, \$3 up per 100 lbs. f. o. b. works, according to quantity. Sal soda is uninteresting at 55c. per 100 lbs., f. o. b. works, and 67 1-2c. for foreign in New York. Bleaching powder shows weakness from freer offerings by jobbers; prices range from \$1.75@\$1.80 per 100 lbs. for prime Liverpool, \$1.62 1-2@\$1.75 for Continental brands, and \$1.37 1-2 @\$1.62 1-2 for American, the latter being nearly all under contract for some time to come. Chlorate of potash is unchanged at \$7 1-2@\$7 3-4 per 100 lbs., f. o. b. works for domestic contracts, and \$8@\$8 1-8 for immediate delivery.

Acids.—Weakness in the copper market has resulted in a cut in the price of blue vitriol. Otherwise the acid market is unchanged, deliveries being principally on contracts.

Quotations are per 100 lbs. as below, unless otherwise specified, for large lots in carboys or bulk (in tank cars), delivered in New York and vicinity.

Acetic, com'l 28%.....	\$1.80	Oxalic, com'l.....	4.15 @5.12 1/2
Blue vitriol.....	4.12 1/2 @4.25	Sulphuric, 50 deg., bulk	ton.....
Muriatic, 18 deg.....	1.50	ton.....	14.00 @16.00
Muriatic, 20 deg.....	1.62 1/2	Sulphuric, 60 deg.....	1.00
Muriatic, 22 deg.....	1.75	Sulphuric, 60 deg.,	bulk.....
Nitric, 36 deg.....	4.00	ton.....	18.00 @20.00
Nitric, 38 deg.....	4.25	Sulphuric, 66 deg.....	1.20
Nitric, 40 deg.....	4.50	Sulphuric, 66 deg.,	bulk.....
Nitric, 42 deg.....	4.87 1/2	ton.....	21.00 @23.00

Brimstone.—Spot is strong. Best unmixed seconds hold at \$24 per ton, and shipments at \$23.25@\$23.50. Best thirds are about \$2.50 per ton less than seconds.

Pyrites.—Virginia producers have strengthened their views for lump ore, but fines are unchanged. Generally demand is good and indications are that this will be an active year.

Quotations are f. o. b.: Mineral City, Va., lump ore, \$5.00 per ton, and fines, 10c. per unit; Charlemont, Mass., lump, \$5, and fines, \$4.75. Spanish pyrites, 12@14c. per unit, delivered ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46 to 51 per cent. of sulphur; American, from 42 to 44 per cent.

Sulphate of Ammonia.—Firm at \$2.85@\$2.87 1-2 per 100 lbs. for 24@25 per cent, gas liquor.

Nitrate of Soda.—The statistical position has been materially strengthened by the reported labor troubles in Chile. The interference with shipments there has caused importers to raise prices. Spot in New York is held at \$1.97 1-2 up per 100 lbs., according to seller, while shipments are quoted at \$1.97 1-2.

Phosphates.—New orders are fair-sized at steady prices.

In South Carolina business is not brisk. Official figures collected for the year from December 1, 1900, to November 30, 1901, show that during that period 82,656 tons of phosphate rock were mined, as against 119,208 tons in the previous year, 90,740 tons were

shipped, against 78,692 tons while stocks on hand November 30, 1901, were 61,845 tons, against 67,716 tons on the same day a year ago. The largest producers were the Central Phosphate Company, and the Beaufort Phosphate Company. The royalty paid the State in 1900-1901 amounted to \$23,108, against \$24,931 in the previous year.

Phosphates.	Per ton F. o. b.	C. I. f. Un'd Kingdom or European Ports.	
		Unit.	Long ton.
*Fla. hard rock (77@80%)..	\$7.50	7 @7 1/4 d	\$10.92 @11.31
*Fla. land pb. (68@73%)..	3.00 @3.25	5 @6 d	7.00 @ 8.40
*Fla. Peace Riv. (58@63%)..	2.25 @2.50	5 @5 1/4 d	6.00 @ 6.60
†Tenn. (78@80%), export..	3.50	6 1/2 @7 d	10.53 @10.92
†Tenn. (78@80%) domestic..	3.00 @3.25		
†Tenn. (75@78%) domestic..	2.75 @3.00		
†Tenn. (70@72%) domestic..	2.25 @2.50		
†So. Car. land rock.....	3.25	4 1/2 @5 d	5.67 @ 6.30
†So. Car. river rock.....	2.75 @3.25		
Algerian, rock... (63@70%)..		6 @6 1/2 d	8.04 @ 8.70
Algerian, rock... (58@63%)..		5 @5 1/2 d	6.00 @ 6.30
Tunis, Gafsa... (58@63%)..		5 @5 1/4 d	6.00 @ 6.30

*Fernandina, Brunswick or Savannah. †Mt. Pleasant. †On vessels Ashley River.

Acid phosphate is quoted at 57 1/2 @60c. per unit

Messina, Sicily. Dec. 31.

(Special Report of Emil Fog & Sons.)

Brimstone.—We notice during October-November a decrease in exports of about 20,000 tons, against last year. Stocks still keep about 60,000 tons in excess of last year, despite a temporary diminution of receipts in November, owing to heavy floods which destroyed roads and carried away railway bridges.

Current thirds, which had been neglected for a long time back, all at once came into favor. Tests of this quality vary considerably from 87 to 95 per cent, according to the different warehouses. The Anglo-Sulphur Company immediately advanced the price about 3s., very unwisely, as this advance may scare off this demand, and they hold a large stock of this quality. Trade complains of unsteadiness of purpose on the part of the Anglo-Sulphur Company, who only a fortnight ago refused to purchase back their own warrants, thereby imparting a disheartening tone to the market, and then without giving any notice, considerably raised their price for one special quality just for the infantine pleasure of making pay a difference on a few hundred tons to some incautious shipper.

At Catania the Socialist Deputy De Felice is forming a trust of the refiners with the assistance of the Government and also of the Anglo-Sicilian Company. He seems to have some chance of succeeding. We quote per ton: Best unmixed seconds, 84s. 9d. (\$20.34); best thirds, 74s. (\$17.76); current thirds, 70s. 9d. (\$16.98); refined block sulphur, 86s. 6d. (\$20.76); refined roll in casks, 95s. 6d. (\$22.80); sublimed flowers, pure, in bags, 103s. 3d. (\$24.78); sublimed flowers, current, in bags, 94s. 3d. (\$22.62).

Receipts are again stiffening. Rates to New York had declined to 6s. 6d. (\$1.56), but recovered again; 8s. (\$1.92) have been paid. We quote: Philadelphia, Boston and Portland, 9s. (\$2.16). We may fix Canadian ports for spring at 7s. 6d. (\$1.80); Baltic, 12s. (\$2.88).

METAL MARKET.

New York. Jan. 23.

GOLD AND SILVER.

Gold and Silver Exports and Imports.

At all United States Ports in December and Year.

Metal	December.		Year.	
	1900.	1901.	1900.	1901.
Gold.				
Exports.....	\$410,533	\$4,744,073	\$54,134,623	\$57,729,889
Imports.....	3,386,611	2,410,966	66,749,084	54,381,882
Excess, I.....	\$2,976,078	E. \$2,333,107	I. \$12,614,461	E. \$3,348,007
Silver.				
Exports.....	\$7,358,339	\$4,723,982	\$66,221,684	\$55,638,901
Imports.....	3,117,857	2,784,757	40,100,343	31,142,949
Excess, E.....	\$4,240,482	E. \$1,939,225	E. \$26,121,321	E. \$24,495,952

These figures include the exports and imports at all United States ports, and are furnished by the Bureau of Statistics of the Treasury Department.

Financial Notes of the Week.

Business continues generally with little change. The speculative markets are still quiet. A small amount of gold—about \$400,000—is reported taken for export to Germany this week.

The statement of the New York Banks, including the 63 banks represented in the Clearing House, for the week ending January 18, gives the following totals, comparison being made with the corresponding weeks in 1901 and 1900:

	1900.	1901.	1902.
Loans and discounts.....	\$680,817,200	\$830,873,400	\$867,529,100
Deposits.....	765,518,100	921,787,200	938,722,200
Circulation.....	16,294,600	30,973,200	31,995,600
Specie.....	152,607,800	184,652,800	177,165,300
Legal tenders.....	62,957,500	73,050,600	76,576,700
Total reserve.....	\$215,565,200	\$257,703,400	\$253,742,000
Legal requirements.....	191,379,525	230,446,500	234,680,550
Balance surplus.....	\$24,185,675	\$27,256,900	\$19,061,450

Changes for the week, this year, were increases of \$3,292,300 in loans and discounts, \$11,739,600 in deposits, \$8,942,600 in specie, \$95,300 in legal tenders, and \$6,103,000 in surplus reserve; a decrease of \$18,100 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 date last year:

	1901.		1902.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ass'd \$184,652,800			\$177,165,900	
England.....	155,846,655	174,885,150		
France.....	467,625,805	\$218,639,735	488,283,500	\$219,003,235
Germany.....	134,105,000	69,080,000	144,615,000	74,495,000
Spain.....	70,005,000	81,950,000	70,125,000	87,000,000
Neth'l'ds.....	25,000,000	27,965,000	28,670,000	31,376,000
Belgium.....	14,500,000	7,250,000	15,683,335	7,841,665
Italy.....	77,640,000	9,265,000	80,500,000	10,312,500
Russia.....	369,315,000	32,020,000	341,245,000	30,920,000

The returns of the Associated Banks of New York are of date January 18, and the others January 16, as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

A French tender for about 1,000,000 oz. silver sent the price upward, and sales for spot were made at 25 13-16d.; but the order being satisfied, the market receded to 25 7-16d., at which it looks steady.

Receipts of silver at the United States Assay Office in New York were 55,000 oz. for the week.

Shipments of silver from London to the East from January 1 to 9, inclusive, are reported by Messrs. Pixley & Abell's circular at £250,000 to India, as against £215,500 last year. Arrivals were £126,000 in bar silver, from New York, £6,000 from the West Indies, and £15,000 from Australia; total, £147,000.

Indian exchange has been stronger in view of the decline in cash balances of the Indian banks and the increased demand for currency, as first crop season is now on. Exports are also increasing. The Council bills offered in London sold at an average of 16.03d. per rupee. At the same time the demand for silver for India is only fair, notwithstanding the lower price of the metal. With exchange over 16d. there is some profit in sending gold from Australia to Bombay and it is probable that shipments of that kind will be made during the current month.

Receipts of specie from Mexico at San Francisco, chiefly by rail, are reported as below for the year ending December 31:

	1900.	1901.	Changes.
Silver dollars.....	\$8,600,838	\$5,558,430	D. \$3,042,408
Silver bullion.....	1,871,864	1,612,848	D. 259,016
Total silver.....	\$10,472,702	\$7,171,278	D. \$3,301,424
Gold bullion.....	266,244	156,621	D. 109,623
Total.....	\$10,738,946	\$7,327,899	D. \$3,411,047

The supply of Mexican dollars was light all through the year. There was a smaller demand for those coins, especially for China, but it still exceeded the supply.

Exports of specie from San Francisco in December included \$45,033 in gold and \$2,565,706 silver. For the year ending December 31 the exports are reported as follows:

	1900.	1901.	Changes.
Gold bars and dust.....	\$8,128	\$22,185	I. \$14,057
U. S. gold coin.....	4,153,496	1,743,167	D. 2,410,329
Total gold.....	\$4,161,624	\$1,965,352	D. \$2,196,272
Silver bars.....	\$4,572,336	\$4,839,464	I. \$267,128
U. S. coin.....	487,801	568,496	I. 80,695
Mexican dollars.....	10,011,354	6,464,768	D. 3,546,586
S. American coin.....	35,027	23,719	D. 11,308
Total silver.....	\$15,106,498	\$11,890,447	D. \$3,216,051
Totals.....	\$19,268,122	\$13,861,799	D. \$5,406,323

The shipments in 1901 were: To China, \$11,086,479; Japan, \$2,280; India, \$30,000; Pacific Islands, \$12,574; Central America, \$720; Mexico, \$100,000; New York, \$2,630,345.

The foreign merchandise trade of Great Britain for the year 1900 is given by the Board of Trade returns as below:

	1900.	1901.
Imports.....	£523,975,163	£522,238,556
Exports.....	354,373,754	348,345,732
Excess, imports.....	£169,601,409	£173,892,824

There was a decrease of £836,177, or 0.2 per cent, in imports; a decrease of £6,028,022, or 1.7 per cent, in exports; and a resulting increase of £5,191,845, or 3.8 per cent, in excess of exports. The gold and silver movement for the year is reported as follows:

	Imports.	Exports.	Excess.
Gold.....	£20,715,628	£13,965,265	Imp. £6,750,363
1900.....	26,190,873	18,397,459	Imp. 7,793,414
Silver.....	11,501,878	12,049,837	Exp. 548,159
1901.....	13,322,300	13,574,580	Exp. 252,280

Of the silver imported this year £9,718,993, or 84.5 per cent of the total, is credited to the United States.

Prices of Foreign Coins.

Table with columns for Bid, Asked, and various foreign currencies including Mexican dollars, Peruvian soles, and Spanish pesetas.

OTHER METALS.

Daily Prices of Metals in New York.

Table showing daily prices for Silver, Copper, and Spelter in New York, with columns for month, exchange rates, and prices in cents.

London quotations are per long ton, (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's.

Copper.—The downward tendency which prevailed for such a long time has at last come to a halt, and more confidence is shown generally.

It is reported that a fire has broken out in the mines of the Mountain Copper Company in California, which will probably seriously interfere with their production.

The foreign market, which closed last week at £46 15s., opened on Monday at £47 10s., advanced on Tuesday to £48 5s., and the closing quotations on Thursday are cabled as £48 12s. 6d.

Refined and manufactured sorts we quote: English tough, £49 10s. @ £50; best selected, £53 10s. @ £54; strong sheets, £65 @ £66; India sheets, £64 @ £65; yellow metal, 6 @ 6 1/2 d.

Exports of copper from New York, Baltimore and Philadelphia in the week ending January 22 are reported by our special correspondents as follows: To Great Britain, 2,715 tons; Holland, 680; Germany, 5; Sweden, 30; France, 125; Italy, 50; South Africa, 4; total, 3,609 tons.

Imports were 334 tons copper and 1,630 tons ore, the latter from Norway.

Imports of copper into Great Britain for the year ending December 31, with exports of copper in all forms, are given by the Board of Trade returns as below, in long tons, the total in the table giving the approximate equivalents in fine copper:

Table showing import and export statistics for copper ore, matte, and fine copper for 1900 and 1901.

Of the imports in 1901 the United States furnished 1,027 tons of ore, 20,869 tons of matte, and 18,957 tons of fine copper. These figures compare with 1,262 tons of ore, 9,108 tons of matte and 28,218 tons of fine copper in 1900.

Tin.—Has been rather irregular throughout the week. Spot metal, which is scarce, advanced steadily until 24 1/2 c. was reached on Tuesday.

The foreign market, which closed on Friday at £104 15s., opened on Monday at £105, advanced on Tuesday to £108 10s., declined on Wednesday to £105, but closes firmer on Thursday at £107 7s. 6d.

Imports of tin into Great Britain for the year 1901 are reported by the Board of Trade as follows: Straits, 25,977 tons; Australia, 3,165 tons; other countries, 6,255 tons; total, 35,397 tons, which compares with

33,118 tons in 1900. Re-exports of foreign tin in 1901 were 20,936 tons, against 19,753 tons in 1900.

Lead.—Is quiet and unchanged at 3.85 @ 3.95c. St. Louis, 3.95 @ 4c., New York.

The foreign market has displayed considerable strength and business is very active. Spanish lead is quoted at £10 18s. 9d. @ £11, English lead £11 1s. 3d. @ £11 2s. 6d.

Imports and exports of lead in Great Britain for the year ending December 31 are given by the Board of Trade returns as follows, in long tons:

Table showing import and export statistics for lead in Great Britain for 1900 and 1901.

The lead credited to the United States is chiefly Mexican lead refined here in bond.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is unchanged. Missouri brands, soft lead, are selling at 3.87 1-2 @ 3.90c. according to brands and delivery.

Spelter.—Is somewhat easier, and producers have been free sellers, the opinion having become general that the proposed combination of smelters has fallen through.

Imports of spelter or metallic zinc into Great Britain during the year 1901 were 68,454 long tons, against 69,536 tons in 1900; showing a decrease of 1,082 tons last year.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is fairly steady. The latest sales are on the basis of 4.10 @ 4.12 1-2c. East St. Louis, with a fairly active demand.

Antimony.—Continues dull. Cookson's is quoted at 10c.; Hallett's at 8c.; Hungarian, Italian, Japanese and U. S. Star, 7 1/2 c.

Nickel.—The price continues firm at 50 @ 60c. per lb., according to size and terms of order. The rumors of a consolidation of nickel interests are referred to elsewhere.

Platinum.—Consumption continues good. Ingot platinum in large lots brings \$19.50 per oz., in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 82c. per gram.

Rumors have been persistently circulated recently that a combination in the platinum trade in this country is under way, and that the plant of Baker & Co., the refiners at Newark, N. J., has been acquired.

Quicksilver.—This metal is now quoted at \$48 per flask New York for large lots, with a slightly higher figure for small orders. San Francisco quotations are \$47.25 @ \$48 per flask for domestic orders, and \$43.50 @ \$44 for export.

Imports of quicksilver into Great Britain for the year ending December 31, 1901, were 2,650,572 lbs., against 2,454,438 lbs. in 1900. The exports from Great Britain in 1901 were 2,014,753 lbs., against 1,940,241 lbs. in 1900.

Receipts of quicksilver at San Francisco in December were 1,822 flasks, making the total for the year 1901, 19,994 flasks, against 21,039 in 1900, and 24,021 in 1899. These receipts do not give the full output of the California mines, as there is a good deal of quicksilver shipped from the mines directly to buyers.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

Table listing prices for various metals and alloys including Aluminum, Ferro-Tungsten, Magnesium, Manganese, Alum-brone, Nickel-alum, Bismuth, Chromium, Copper, Ferro-Molyb'dum, Ferro-Titanium, and Tungsten.

Variations in prices depend chiefly on the size of the order.

Average Prices of Metals per lb., New York

Table showing average prices for Copper, Tin, Lead, and Spelter in New York for 1901 and 1900.

The prices given in the table for copper are the averages for electrolytic copper. The average price for Lake copper for the year 1900 was 16.52c.; for the month of January, 1901, it was 16.77c.; for February, 16.90c.; for March, 16.94c.; for April, 16.94c.; for May, 16.94c.; for June, 16.90c.; for July, 16.61c.; for August, 16.60c.; for September, 16.54c.; for October, 16.60c.; for November, 16.33c.; for December, 14.30c.; for the year 1901, 16.53c.

Average Prices of Silver, per oz., Troy.

Table showing average prices for Silver in New York and London for 1901, 1900, and 1899.

The New York prices are per fine ounce; the London quotations are per standard ounce, .925 fine.

UNITED STATES.

Table showing import and export statistics for various ores and metals in the United States for 1901 and 1900.

Table showing import and export statistics for various minerals in the United States for 1901 and 1900.

The figures for copper are those given by the Treasury Department. The statement made by Mr. John Stanton for the Associated Copper Companies will be found monthly in our metal market. These figures give the exports for November as 6,069 long tons, eleven months, 80,195 tons.

Import Duties.

Metals.—The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, 1/2 c. a lb. Lead 1 1/2 c. a lb. on lead ores; 2 1/2 c. a lb. on pigs, bars, etc., 2 1/2 c. on sheet pipe and manufactured forms. Nickel, 6c. a lb.

Minerals.—Duties are: Asphalt, crude, \$1.50 per ton, and refined \$3 per ton. Coal, bituminous, 6c. long ton; coke, 20c. ad. val. Cement, Roman, Portland and hydraulic, in bulk, 8c. per 100 lbs., and in packages 7c. Copper sulphate, 1/2 c. a lb. Salt in bulk, 8c. per 100 lbs., and in bags, etc., 12c. Brimstone, anthracite coal, graphite, phosphate rock, pyrites and nitrate of soda are free of duty.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies and locations with columns for par value, shares listed, and prices for various dates from Jan. 16 to Jan. 22.

Coal and Industrial Stocks.

Table of coal and industrial stock quotations, listing companies like Am. Agr. Chem. U.S., Am. Car & Fdy., etc., with columns for par value, shares, and prices.

PHILADELPHIA, PA. \$

Table of stock quotations for Philadelphia, PA, listing companies and locations with columns for par value, shares, and prices.

MEXICO.

Jan. 11.

Table of stock quotations for Mexico, listing companies and locations with columns for shares, last dividend, and prices.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies and locations with columns for par value, shares listed, and prices.

Official Quotations, Boston Stock Exchange. Total sales, 90,121 shares. †Ex-dividend. \$Ex-assnt. paid.

ST. LOUIS, MO.*

Jan. 20.

Table of stock quotations for St. Louis, MO, listing companies and locations with columns for shares, par value, bid, ask, and sales.

*From our Special Correspondent.

SPOKANE, WASH.

Jan. 16.

Table of stock quotations for Spokane, Wash., listing companies and locations with columns for par value, bid, ask, and sales.

SALT LAKE CITY.*

Jan. 18.

Table of stock quotations for Salt Lake City, listing companies and locations with columns for shares, par value, and quotations.

*By our Special Correspondent. Total number of shares sold, 11,650,000

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing companies like Acacia, Alamo, Anaconda, etc., with columns for par value, high/low prices, and sales.

LONDON.

Jan. 10.

Table of stock quotations for London, listing companies like Alasks-Treadwell, Anaconda, Copiapo, etc., with columns for name, capital, par value, dividends, and quotations.

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver.

PARIS.

Jan. 9.

Table of stock quotations for Paris, listing companies like Acieries de Creusot, Anzin, Brianks, etc., with columns for name, country, product, capital, and prices.

TORONTO, ONT.

Table of stock quotations for Toronto, Ont., listing companies like Ontario, Golden Star, Cariboo Mck., etc., with columns for name, par value, and sales.

MONTREAL, CANADA.

Jan. 15.

Table of stock quotations for Montreal, Canada, listing companies like Big Three, California, Can. Gold Fields, etc., with columns for name, par value, and sales.

CHEMICALS, MINERALS, RARE EARTHS, ETC. CURRENT WHOLESALE PRICES.

Abrasives—		Cust. Meas.	Price.	Barium—		Cust. Meas.	Price	Graphite—Am. f.o.b. Provi-		Cust. Meas.	Price	Paints and Colors—		Cust. Meas.	Price
Carborundum, f.o.b. Niagara Falls, Powd., F. F. F. F.		lb.	\$0.08	Oxide, Am. hyd. cryst.		lb.	\$0.02 3/4	dence, R. I. lump.		sh. ton	8.00	Metallic, brown		sh. ton	\$19.00
Grains		"	.10	Sulphate (Blanc Fixe)		"	.02	Pulverized		"	30.00	Red		"	16.00
Corundum, N. C.		"	.07 @ .10	Barytes—				German, som. pulv.		lb.	.01 1/4 @ .01 1/2	Ocher, Am. common		"	9.25 @ 10.00
Chester, Mass.		"	.04 1/2 @ .05	Am. Crude, No. 1		sh. ton	9.00	Best pulverized		"	.01 1/2 @ .02	Best		"	21.25 @ 25.00
Barry's Bay, Ont.		"	.07 1/2 @ .09 1/2	Crude, No. 2		"	8.00	Ceylon, common pulv.		"	.02 3/4 @ .03 1/2	Dutch, washed		lb.	.04 1/2
Crushed Steel, f.o.b. Pittsburg		"	.05 1/2	Crude, No. 3		"	7.75	Best pulverized		"	.04 @ .08	French, washed		"	.01 1/4 @ .01 3/4
Emery, Turkish flour, in kegs		"	.03 1/2	German, gray		"	14.50	Italian, pulv.		"	.01 1/4	Orange mineral, Am.		"	.07 1/4 @ .07 1/2
Grains, in kegs		"	.05 @ .05 1/2	Snow white		"	17.00	Gypsum—Ground		sh. ton	8.00 @ 8.50	Foreign, as to make		"	.08 @ .10 1/2
Naxos flour, in kegs		"	.03 1/2	Bauxite—Ga. or Ala. mines:				Fertilizer		"	7.00	Paris green, pure, bulk		"	.12 1/2
Grains, in kegs		"	.05 @ .05 1/2	First grade		lg. ton	5.50	Rock		lg. ton	4.00	Red lead, American		"	.05 1/2 @ .05 3/4
Chester flour, in kegs		"	.03 1/2	Second grade		"	4.75	English and French		"	14.00 @ 16.00	Foreign		"	.06 3/4 @ .08 1/2
Grains, in kegs		"	.05 @ .05 1/2	Bismuth—Subnitrate		lb.	1.40	Infusorial Earth—Ground				Turpentine, spirits		gal.	4.11 1/2
Peekskill, f.o.b. Easton, Pa., flour, in kegs		"	.01 1/2	Subcarbonate		"	1.65	American, best		"	20.00	White lead, Am., dry		lb.	.04 1/4 @ .04 1/2
Grains, in kegs		"	.02 1/2	Bitumen—"B"		"	.03 1/2	French		"	37.50	American, in oil		"	.05 1/2 @ .05 3/4
Crude, ex-ship N. Y.: Ab-				"A"		"	.05	German		"	40.00	Foreign, in oil		"	.07 1/4 @ .08 1/2
bott (Turkey)		lg. ton	26.50 @ 30.00	Bone Ash		"	.02 1/4 @ .02 1/2	Iodine—Crude		100 lbs.	2.45	Zinc, white, Am., ex dry		"	.04 1/4 @ .04 1/2
Kuluk (Turkey)		"	22.00 @ 24.00	Borax		"	.07 1/4 @ .07 1/2	Iron—Muriate		lb.	.05	American, red seal		"	.06 1/2
Naxos (Greek) h. gr.		"	.26.00	Bromine		"	.40	Nitrate, com'l.		"	.01 1/4	Green seal		"	.07
Garnet, as per quality		sh. ton	25.00 @ 35.00	Cadmium—Metallic		"	1.40	True		"	.04	Foreign, red seal, dry		"	.05 3/4 @ .08
Pumice Stone, Am. powd.		lb.	.01 3/2 @ .02	Sulphate		100 lbs.	2.00 @ 2.50	Oxide, pure copperas col.		"	.05 @ .10	Green seal, dry		"	.06 1/2 @ .06 1/2
Italian, powdered		"	.01 1/2	Calcium—Acetate, gray		"	1.25	Purple-brown		"	.02	Potash—			
Lump, per quality		"	.04 @ .40	" brown		"	.85	Venetian red		"	.01 @ .01 1/2	Caustic, ordinary		"	.04 1/2 @ .06
Rottenstone, ground		"	.02 1/2 @ .04 1/2	Carbide, ton lots f.o.b. Niagara Falls, N. Y., or Jersey City, N. J.		sh. ton	75.00	Scale		"	.01 @ .03	Elect. (90%)		"	.06 1/2
Lump, per quality		"	.06 @ .20	Carbonate, ppt.		lb.	.05	Kaolin—(See Clay, China.)				Potassium—			
Rouge, per quality		"	.10 @ .30	Chloride, com'l.		100 lbs.	.75 @ .80	Kryolith—(See Cryolite.)				Bicarbonate cryst.		"	.08 1/4
Steel Emery, f.o.b. Pittsburg		"	.07	Best		"	1.00	Lead—Acetate, white		"	.07 1/4 @ .08	Powdered or gran.		"	.14
Acids—				Cement—				Brown		"	.06	Bichromate, Am.		"	.08 1/4
Boracic, crystals		"	.10 1/2 @ .11	Portland, Am., 400 lbs.		bbbl.	1.70 @ 2.00	Nitrate, com'l.		"	.06 1/2	Scotch		"	.08 1/2 @ .09
Powdered		"	.11 1/4 @ .11 1/2	Foreign		"	1.65 @ 2.25	" gran.		"	.08 1/4	Carbonate, hydrated		"	.04 @ .04 1/2
Carbonic, liquid gas		"	.12 1/2	"Rosendale," 300 lbs.		"	.95	Lime—Com., abt. 250 lbs.		bbbl.	.80	Calcined		"	.03 1/2 @ .03 3/4
Chronic, crude		"	.20	Slag cement, imported		"	1.65	Finishing		"	.90	Chromate		"	.35
Hydrofluoric, 36%		"	.05	Ceresine—				Magnesite—Greece.				Cyanide (98 @ 99%)		"	.24 @ .25
48%		"	.05	Orange and Yellow		lb.	.12	Crude (35%)		lg. ton	6.50 @ 7.00	Kainit		lg. ton	9.05
Best		"	.25	White		lb.	.13 1/2	Calcined		sh. ton	14.00 @ 15.00	Manure salt, 20%		100 lbs.	.66
Sulphurous, liquid anhy.		"	.08	Chalk—Lump, bulk		sh. ton	2.45	Bricks		M	170.00	Double Manure salt, 48 @ 53%		"	1.12
Alcohol—Grain		gal.	2.55	Ppt. per quality		lb.	.03 1/4 @ .06	Am. Bricks, f.o.b. Pittsburg		"	175.00	Muriate, 80 @ 85%		"	1.83
Refined wood, 95 @ 97%		"	.60 @ .65	Chlorine—Liquid		"	.30	Magnesium—				95%		"	1.86
Purified		"	1.20 @ 1.50	Water		"	.10	Carbonate, light, fine pd.		lb.	.04 1/2	Permanganate		lb.	.09 1/2 @ .10 1/4
Alum—Lump		100 lbs.	1.75	Chrome Ore—				Blocks		"	.06 @ .07	Prussiate, yellow		"	.13 1/2 @ .13 3/4
Ground		"	1.80	(50% ch.) ex-ship N. Y.		lg. ton	24.75	Chloride, com'l.		"	.01 3/4	Red		"	.37 @ .37 1/2
Powdered		"	3.00	Sand, f.o.b. Baltimore		"	33.00	Fused		"	.20	Sulphate, 90%		100 lbs.	2.11
Chrome, com'l.		"	2.75 @ 3.00	Bricks, f.o.b. Pittsburg		M	175.00	Nitrate		"	.60	96%		"	2.14
Aluminum—				Clay, China—Am. com., ex-				Sulphate		100 lbs.	.75 @ .95	Sylvinit		unit	35 1/2
Nitrate		lb.	1.50	dock, N. Y.		lg. ton	8.00	Manganese—Powdered,				Quartz—(See Silica.)			
Oxide, com'l, common		"	.06 1/2	Am. best, ex-dock, N. Y.		"	9.00	70 @ 75% binoxide		lb.	.01 1/4 @ .01 1/2	Salt—N. Y. com. fine		sh. ton	2.00
Best		"	.20	English, common		"	12.00	Crude, pow'd.		"	.01 1/4 @ .02 1/4	N. Y. agricultural		"	1.50
Pure		"	.80	Best grade		"	17.00	75 @ 85% binoxide		"	.01 1/2 @ .02 1/4	Refined		100 lbs.	3.50 @ 3.55
Hydrated		100 lbs.	2.60	Fire Clay, ordinary		sh. ton	4.25	85 @ 90% binoxide		"	.02 1/4 @ .03 1/4	4.37 1/2 @ 4.62 1/2			
Sulphate, pure		"	1.50 @ 2.00	Best		"	6.00	90 @ 95% binoxide		"	.03 1/4 @ .05 1/4	Silica—Best foreign		lg. ton	10.00 @ 11.00
Com'l.		"	1.15 @ 1.25	Slip Clay		"	5.00	Carbonate		"	.16 @ .20	Ground quartz, ord.		sh. ton	6.00 @ 8.00
Ammonia—				Coal Tar Pitch		gal.	.08	Chloride		"	.04	Best		"	12.00 @ 13.00
Aqua, 16°		lb.	.03	Cobalt—Carbonate		lb.	1.75	Ore, 50%, Foreign		unit	.22 @ .23	Lump quartz		"	2.50 @ 4.00
18°		"	.03 1/2	Nitrate		"	1.50	Domestic		"	.30	Glass sand		"	2.75
20°		"	.03 3/4	Oxide—Black		"	2.26 @ 2.30	Marble—Flour		sh. ton	6.00 @ 7.00	Silver—Chloride		oz.	.65
20°		"	.05 1/2	Gray		"	2.28 @ 2.40	Mercury—Bichloride		lb.	.77	Nitrate		"	.39 1/2
Ammonium—				Smalt, blue ordinary		"	.06	Mica—N. Y. grnd, coarse		"	.03 @ .04	Oxide		"	.85 @ 1.10
Carbonate, lump		"	.08 1/2 @ .09 1/4	Best		"	.20	Fine		"	.04 @ .05	Sodium—			
Powdered		"	.06 @ .09 1/4	Copperas		100 lbs.	.30 @ .35	Sheets, N. C., 2x4 in.		"	.30	Bichromate		lb.	.06 1/4
Muriate, grain		"	.05 1/2	Copper—Carbonate		lb.	.18	3x3 in.		"	.80	Chlorate, com'l.		"	.08 1/4 @ .08 3/4
Lump		"	.08 1/2	Chloride		"	.25	3x4 in.		"	1.50	Hyposulphite, Am.		100 lbs.	1.60 @ 1.65
Nitrate, white, pure (99%)		"	.12	Nitrate, crystals		"	.35	4x4 in.		"	2.00	German		"	1.70 @ 1.90
Com'l gray		"	.07	Oxide, com'l.		"	.19	6x6 in.		"	3.00	Peroxide		lb.	.45
Sulphuret com'l.		"	.16	Cryolite		"	.06 1/2	Mineral Wool—				Phosphate		"	.02 1/2
Phosphate, com'l.		"	.09	Explosives—				Slag, ordinary		sh. ton	19.00	Prussiate		"	.10 1/4 @ .11
Chem., pure		"	.06	Blasting powder, A		25 lb. keg	2.65	Selected		"	25.00	Silicate, conc.		"	.05
Antimony—Glass		"	.30 @ .40	Blasting powder, B		"	1.40	Rock, ordinary		"	32.00	Com'l.		"	.01
Needle, lump		"	.05 1/2 @ .06	"Rackarock," A		lb.	.25	Selected		"	40.00	Sulphate, com'l.		100 lb.	.77 1/2
Powdered, ordinary		"	.05 1/2	"Rackarock," B		"	.18	Nickel—Oxide, No. 1		lb.	1.00	Sulphide		lb.	.01 1/4
Best		"	.08 1/2	Judson R. R. powder		"	.10	No. 2		"	.60	Sulphite crystals		"	.02 1/2
Oxide, com'l white, 95%		"	.09 1/2	Dynamite (30% nitro-glycerine)		"	.13	Sulphate		"	.20 @ .21	Flour		"	1.90
Com'l gray		"	.12	(30% nitro-glycerine)		"	.14	Oils—Black, reduced 29 gr.:				Flowers, sublimed		"	2.15
Sulphuret com'l.		"	.16	(40% nitro-glycerine)		"	.15	25 @ 30, cold test		gal.	.09 1/2 @ .10 1/4	Tale—N. C., 1st grade		sh. ton	13.75
Arsenic—White		"	.03 1/4 @ .03 1/2	(50% nitro-glycerine)		"	.16 1/2	15, cold test		"	.10 1/4 @ .11 1/4	N. Y., Fibrous, best		"	10.20
Red		"	.06 1/2 @ .07 1/4	(60% nitro-glycerine)		"	.18	Zero		"	.11 1/4 @ .12 1/4	French, best		100 lbs.	1.25
Asphaltum—				(75% nitro-glycerine)		"	.21	Summer		"	.09 1/4 @ .09 3/4	Italian, best		"	1.62 1/2
Ventura, Cal.		sh. ton	32.00	Glycerine for nitro (32-2-10° Be.)		"	.12 1/2 @ .13	Cylinder, dark steam ref.		"	.08 1/4 @ .10 1/4	Tar—Regular		bbbl.	1.95
Cuban		lb.	.01 1/4 @ .03 1/4	Feldspar—Ground		sh. ton	8.00 @ 9.00	Dark, filtered		"	.11 1/4 @ .15 1/4	Oil barrels		"	3.80
Egyptian, crude		"	.05 1/4 @ .06	Flint Pebbles—Danish, Best		lg. ton	14.75	Light filtered		"	.14 1/4 @ .17 1/4	Tin—Crystals		lb.	.20 @ 2.14
Trinidad, refined		sh. ton	35.00	French, Best		"	11.75	Extra cold test		"	.21 1/4 @ .26 1/4	Oxide		"	.42
San Valentino (Italian)		lg. ton	16.00	Fluorspar—				Gasoline, 80° @ 90°		bbbl.	.14 @ .19	Uranium—Oxide		"	2.25 @ 3.00
Seyssel (French), mastic		sh. ton	21.00	Am. lump, 1st grade		sh. ton	\$14.40	Naphtha, crude, 68° @ 72°		bbbl.	9.05	Zinc—Metallic, ch. pure		"	.07 @ .09 1/2
Gilsonite, Utah, ordinary		lb.	.03	2d grade		"	13.90	"Stove"		gal.	.12	Carbonate		"	.15
Select		"	.03 1/4	Gravel and crushed, 1st gr.		"	13.40	Linseed, domestic raw		"	.59 @ .60	Chloride		"	.05
Barium—				2d grade		"	12.40	Boiled		"	.62	Dust		"	.05 1/2 @ .05 3/4
Carb. Lump, 80 @ 90%		sh. ton	25.00 @ 27.50	Ground, 1st grade		"	17.90	Calcutta, raw		"	.85	Sulphate		"	.02 1/2 @ .02 3/4
82 @ 98%		"	26.00 @ 29.00	2d grade		"	16.50	Ozokerite		lb.	11 1/2	Zirconium—Nitrate		"	8.00
Powdered, 80 @ 90%		lb.	.01 1/4 @ .02	Foreign, lump		"	8.00 @ 12.00	Paints and Colors—				Boron—Nitrate		lb.	\$1.50
Chloride, com'l.		100 lbs.	1.67 1/2 @ 1.76	Ground		"	11.50 @ 14.00	Chrome green, common		"	.05	Calcium—Tungstate (Scheelite)			