

THE ENGINEERING AND MINING JOURNAL



(Published Every Saturday at 253 Broadway, New York.)

Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LXVII. MAY 13. No. 19.

RICHARD P. ROTHWELL, C. E. M. E., Editor. ROSSITER W. RAYMOND, Ph. D., M. E., Special Contributor. THE SCIENTIFIC PUBLISHING CO., Publishers.

Subscriptions are PAYABLE IN ADVANCE. For the United States, Mexico and Canada, \$5 per annum: all other countries in the Postal Union, \$7. REMITTANCES should be made by bank drafts, post office orders or express money orders on New York, payable to the Scientific Publishing Co.

Main Office: 253 Broadway (P. O. Box 1833), NEW YORK. Telephone Number, 3,095 Cortlandt. New York Cable Address—"ROTHWELL." (Use McNeill's or A. B. O. 4th Edition Code.) London Cable Address—"PULCHETTO."

Branch Offices: Chicago, Ill., Monadnock Building, Room 787. Denver, Colo., Boston Building, Room 206. Salt Lake City, Utah, Atlas Building. San Francisco, Cal., 207 Montgomery Street.

Victoria, B. C., Office, 28 Broad Street. Wm. M. Brewer, Manager. London, Eng., Office, 20 Bucklersbury, 368. E. Walker, Manager. English subscriptions to the JOURNAL may be paid at the London office at the rate of \$7 = £1 8s. 9d.; the publications of the Scientific Publishing Company may be bought at the rate of 4s. 2d. to the dollar, net.

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We regret that in the hurry of going to press last week an error was allowed to slip into our table of average prices of metals. Through a misprint, the average price of Lake Copper in New York for the month of April was given in the table at 18.03 cents; but it should have been, as we find on carefully revising the figures, 18.43 cents. The necessary correction is made in the table this week. We are aware of the importance of these quotations, and take, as our readers know, great pains to make them as correct as possible and representative of the actual condition of the market at the time. We shall continue to do so, believing that the quotations which we secure are not only the most nearly correct, but the only ones which are impartial and wholly unbiased by the interests of any parties in the market.

The reaction in the copper stocks in Boston this week, which has caused a heavy fall in quotations, is only the natural result of the speculation in those stocks which had been carried too far. It was not unexpected by the careful observers, though doubtless many operators have been caught by the drop. Temporarily it has suspended the flotation of new projects, but this can be borne with a good deal of equanimity. The prices, even of the reliable dividend-paying stocks, are still very high, and a further fall is really needed to adjust values. Even the reaction seems to affect very little the rush for the stock of the new Amalgamated Copper Company. The public is taking that stock apparently on the faith in the names of the people who floated the company, since very few details are given about the company, and the whole affair is very much in the nature of a "blind pool."

It was to be expected that attention would be drawn to our new colonial possessions, and that enterprising men would be prepared at an early date to exploit such mineral resources as they possess. Some prospecting has been done in Porto Rico, but so far with very small results. In Cuba there has been an attempt to reopen the old copper mines of El Cobre, and negotiations are pending for a sale of the old stockholders' interests. Some locations have been made of other copper properties and of manganese properties, but the unsettled condition of government will prevent much work for the present. In the Philippines nothing can be done while the war continues, but as soon as a settled government is established we may expect to see plenty of prospecting. A number of the volunteers now there are from mining States and some may conclude to explore the new country before returning home when their terms of service expire.

One-third of the year has now passed, and all the indications thus far lead us to expect that 1899 will show a continuance of the large production of gold, which was a marked feature of 1898. The Colorado output is well maintained, in spite of the severe winter, while California has the abundant supply of water which has been lacking for years past; so that the mines of that State will probably do much better than last year. Good reports come from the other producing States of the Rocky Mountains, and something may be expected from the new districts in Washington which are being actively exploited.

Silver production may show a set-back from the extraordinary storms of the winter, which have for three months stopped work at Leadville and elsewhere in Colorado; and from the troubles in the Coeur d'Alene. Probably the falling off will not be very great, however. At least a part of it may be made up later in the year.

The water-borne traffic of Lake Superior during the season of 1898 reached the largest amount ever shown. Estimating the business on the basis of the tonnage passing through the Sault Ste. Marie Canal, the report of the United States Engineer officer in charge of the canal gives the total traffic carried for the season at 17,891,597,030 ton-miles; the average distance which freight was carried being 842.6 miles. The chief items of this trade, in the order of their importance, were grain, iron ore, lumber, coal and copper.

The rates received on this traffic last season were the lowest on record, and probably the lowest ever charged for a similar service. The average receipt, taking all classes of freight together, was 0.79 mill per ton-mile; which compares with 0.83 mill in the preceding year, 0.99 mill in 1896 and 1.14 mills in 1895. That is, a ton of freight could be carried last season 1,266 miles for \$1. The average receipt of a ton of freight carried between Lake Superior points and the ports of the lower lakes was 66.5 cents.

Of course freight can only be carried at such rates by handling it in large quantities and in full cargoes. There is little chance on the Lakes now for any except the large and well equipped vessels. The largest cargo credited to any steamer passing the Sault during the season was 7,280 short tons, carried by the steamer "S. F. B. Morse"; the heaviest in any barge was 7,840 tons, carried by the "John A. Roebling." Both these vessels are owned by the Bessemer Steamship Company, of Cleve-

land, Ohio. The number of trips counts, as well as the weight of a single cargo, and the steamer "Empire City," of Duluth, made the season's record by carrying a total of 138,726 short tons of freight, equivalent to 126,266,531 ton-miles; the average length of her trips being 910 miles.

Such figures as these explain the success which the Lake Superior miners have had in supplying the iron ore market of so large a section of the country.

In the death of Mr. W. Y. Campbell, which we record on another page, the mining interests of South Africa have lost one of their best representatives and champions. Mr. Campbell had been for twelve or thirteen years past identified with the progress of the Witwatersrand, and he was one of the few who are able to look beyond the immediate present and to plan and prepare for the future. Moreover, he was by nature a statistician, with the keen instinct for facts and the inborn desire for correctness which that disposition involves. He was never satisfied with "good enough" facts or figures, but must have them correct; and it is very largely due to his work that the Transvaal companies were brought to appreciate the value of correct statements and to realize how great were the economies which could be effected in working their mines and mills. Mr. Campbell had something also of the judicial temperament which is perhaps a necessary complement of the statistical; and while he was an active advocate of the interests which he represented, he was also willing to do justice to the other side. For this reason, while he was a leader of the Uitlanders, he still retained a great deal of influence with the Boer leaders, the more conservative of whom were always ready to listen to him. He did much to make the world acquainted with the true condition of the Witwatersrand and its future possibilities, and he will be greatly missed, for there is no one who is at present qualified to take exactly the place which he filled.

THE TROUBLES IN THE COEUR D'ALENE.

The situation in the Coeur d' Alenes remains practically unchanged. The Idaho authorities have announced their intention of restoring and maintaining order, and the district is at present under martial law, which is enforced by the Federal troops ordered there by the Government. These include several detachments of infantry and cavalry, amounting in all to a considerable force. Their first work was to arrest a large number of the rioters concerned in the outrage at the Bunker Hill & Sullivan Mill, including nearly the entire male population of Burke, where the Union had most strength. The local authorities had not molested these men, but over 300 of them are reported gathered in by the troops. A number escaped over the mountains, however, most of them making their way into Montana. What the immediate result will be is uncertain, as it might be difficult to convict many of the rioters in court. It may be remembered, however, that the trial will probably not be in the State courts, as the men arrested are in Federal custody, and they can be tried in the Federal courts on two charges; the first being for disobeying the injunction against interference with the Bunker Hill & Sullivan Mill property, to which we referred to last week, and the second for interfering with and stealing a train carrying United States mail. On either charge the Federal court has jurisdiction and can inflict summary punishment.

It is quite probable that the military occupation of the district will continue for several months, the present indications all pointing to a long period of martial law.

A new feature has been introduced by a proclamation issued by order of the Governor of Idaho, and directed to the mine-owners of Shoshone County. This proclamation begins with an order forbidding the mine-owners, during the continuance of martial law, to employ men belonging to the organizations which have shown themselves to be criminal in purpose, since they have procured the destruction of property with murder and personal outrage. It is therefore ordered that no one can be employed in mines within the proclaimed district unless he has a permit from the sheriff of the county; and men now at work must procure such a permit within ten days under penalty of discharge.

This placing the Miners' Union under ban is not by any means too severe a penalty, since they have fully deserved it by their recent action. It is encouraging, however, as showing that the State authorities are in earnest in their intention of restoring order in the region and of maintaining it as far as possible. It will be a difficult matter, however, as long as the present population remains in the Coeur d'Alene. Doubtless there are good citizens there, but the lawless element is too strong to be trusted, and a new outbreak may quite possibly follow the termination of martial law. The class of men who have terrorized the region, and has done its best to destroy its prosperity, is composed of men who recognize no authority but force, and are not likely to be moved by any appeal to respect the law. They should be made to feel force to its fullest extent, and no mercy should be shown to any one engaged in the recent outrages which have disgraced the region.

PENNSYLVANIA BITUMINOUS COAL IN 1898.

Pennsylvania continued in 1898 to be by far the largest producer of bituminous coal among the States, its output reaching about 40 per cent. of the total mined in the United States during the year. Moreover, there was a notable increase in the production, which came from almost every section of the bituminous region. The Pittsburg District had a large share of the gain, but the Northwestern districts and the central region, which ships to the tidewater markets, alike did well. The largest increase, however, was in the coke districts of the southwestern section of the State. The following table shows the production and shipments, as made up from the reports of the mine inspectors, the figures being in short tons of 2,000 pounds:

| | 1897. | 1898. | Changes. | Per ct. |
|------------------------|------------|---------------|-----------|---------|
| Tons coal mined..... | 54,454,655 | 64,247,859 I. | 9,793,204 | 18.0 |
| Tons coal shipped..... | 40,260,127 | 47,076,522 I. | 6,816,395 | 16.9 |
| Tons coke made..... | 8,533,291 | 10,671,920 I. | 2,138,629 | 25.1 |

The gain of 18 per cent. in coal mined was a very considerable one, and reflects the greater industrial activity of the year, as compared with the preceding one. The increase in shipments was somewhat less, being 16.9 per cent.; but this is fully explained by the larger quantity converted into coke and shipped in that form. The production of coke showed an increase of no less than 25.1 per cent., the direct result of the great activity in the iron trade. Indeed, it was almost in the same proportion as the gain in pig iron and steel production. The Connellsville coal-field, which furnishes the largest proportion of coking coal, was probably the most actively worked district in the country last year. Nearly every mine was a large producer, and new openings were made. This region is beginning to show signs of partial exhaustion, and some of the large operators are preparing for the future by securing large tracts of land in the West Virginia coal-fields.

The increase in shipments of raw coal was well distributed. Part of it was in the seaboard trade; a very considerable part in the Lake trade; and a much smaller share in the trade of the Pittsburg region down the Ohio and Mississippi Rivers. The river trade continues to feel the active competition of West Virginia, Kentucky and even Alabama coals; but in the Lake trade Pennsylvania held its own share better than for several years past.

The distinction between coal mined and that shipped and converted into coke is not clearly conveyed in the reports, so that it is impossible to ascertain exactly the quantity converted into coke and that used in operating the mines. A good deal of that consumed in operating is slack and waste, and is not closely measured nor accounted for.

The following table shows the number of employes engaged in bituminous coal mining in the State:

| | 1897. | 1898. | Changes. |
|--------------------------------------|--------|-----------|----------|
| Number of employes underground..... | 73,418 | 73,709 I. | 291 |
| " " " surface | 13,136 | 14,092 I. | 956 |
| Total | 86,554 | 87,801 I. | 1,247 |
| Tons mined per underground workmen.. | 742 | 872 I. | 139 |
| per employe | 629 | 732 I. | 103 |

It will be seen that, in spite of the great increase in production, there was hardly any in the number of employes. This was only to a slight extent due to the introduction of mining machines; it was chiefly because the working force has been too large for years, and a larger output did not require more men; it simply gave more days' work to those already on the ground. To the miners the situation was a more satisfactory one in this respect than it has been for several years.

While there was no notably fatal accident during the year, there was a considerable increase in the number of casualties, as shown in the following table:

| | 1897. | 1898. | Changes. |
|-------------------------------------|---------|------------|----------|
| Number killed | 149 | 199 I. | 50 |
| Number injured | 426 | 458 I. | 32 |
| Total casualties | 575 | 657 I. | 82 |
| Tons coal mined per man killed..... | 365,881 | 322,852 D. | 43,029 |
| " " " injured..... | 127,828 | 140,278 I. | 12,450 |
| " " " casualty | 94,704 | 97,789 I. | 3,085 |
| Number killed per 1,000..... | 1.68 | 2.26 I. | 0.58 |
| injured | 4.81 | 5.22 I. | 0.41 |
| Total | 6.49 | 7.48 I. | 0.99 |

The following table shows the causes of the accidents reported in 1898:

| | Killed. | Injured. | Total. | Per ct. |
|----------------------------------|---------|----------|--------|---------|
| Falls of roof and coal..... | 130 | 268 | 398 | 60.6 |
| Crushed by cars, etc..... | 37 | 114 | 151 | 23.0 |
| Blasting | 5 | 20 | 25 | 3.8 |
| Explosions of gas and dust... 12 | 7 | 19 | 29 | 4.4 |
| Electricity | 3 | 3 | 6 | 0.9 |
| Falling down shaft..... | 1 | 1 | 2 | 0.3 |
| Miscellaneous | 7 | 43 | 50 | 7.5 |
| Total underground..... | 195 | 452 | 647 | 98.5 |
| Surface accidents | 4 | 6 | 10 | 1.5 |
| Total | 199 | 458 | 657 | 100 |

There was no especial cause for the greater number of accidents, except the more active operation of the mines, and the extensions of un-

derground workings. The mining laws were carefully enforced, according to the report. Even with the increase shown, the proportion of deaths per 1,000 employes was not a high one; again showing that mining is not by any means as hazardous an occupation as is generally supposed.

As in almost all reports of the kind, we find falls of roof and coal the most prominent cause of deaths and injuries. The others call for no special remark, except that electricity appears in the list for the first time, causing three deaths; though just in what manner these occurred we have no information.

NEW PUBLICATIONS

"The Gold Measures of Nova Scotia and Deep Mining." By E. R. Fairbault. Ottawa, Canada; published for the Author. Pamphlet, pages, 12; with map and plates.

This interesting paper is a careful study of the geology of the Nova Scotia gold-fields, with special reference to its bearing on the question of the probable success of deep mining operations. Though the yield of the Nova Scotia gold mines has been good and fairly steady, the work so far done has been surface work, comparatively speaking, and few mines have gone down further than 300 ft. A new era is beginning, however, and several companies are preparing to sink deep shafts and explore the lower levels of their properties. Hence this study is a timely one. It was presented at the March meeting of the Canadian Mining Institute, and is now reprinted.

"Seventeenth Annual Report of the State Bureau of Labor Statistics Concerning Coal in Illinois; 1898." David Ross, Secretary. Springfield, Ill.; State Printer. Pages, 278.

This report covers a year which was marked in Illinois by serious trouble between operators and miners, culminating in the Pana riots, with loss of life and destruction of property. The State Bureau follows the lead of Gov. Tanner, imputing the blame to the operators. So far their views may be correct; but they go further and support the Governor's clearly illegal and unjustifiable course in denying citizens of the United States the right to enter Illinois in search of work. We commented on this usurpation of power at the time, and can add nothing further now to the condemnation of the Governor's action, which all reasonable men have expressed.

The statistical part of the report shows that there were 881 mines in Illinois last year, including a large number of small openings, operated only for local trade. The total output of these mines was 18,599,299 short tons. There were 55 mines in which machines were used, and the machine output was 19 per cent. of the total. There were 35,026 men employed, 31,602 underground and 3,424 on the surface. The number of miners killed by accident was 75, showing a death rate of 2.14 per 1,000 employees. The number of men injured was 438, or 12.51 per 1,000. Both rates appear high. The coal mined per man employed averaged 559 tons for the year.

"West Virginia Geological Survey: Volume 1." I. C. White, State Geologist. Morgantown, W. Va.; printed for the Survey. Pages, 392.

The introduction of this first volume issued by the West Virginia Geological Survey well expresses the necessity and value to the State of such a survey; and the only wonder is that its beginning has been so long postponed. A very large part of the wealth of the State—present and prospective—is in its mineral resources, and no money can be more profitably expended than in the surveys which will aid in the knowledge and development of these. The Survey has been cordially received by the more enlightened part of the people, and many firms, companies and individuals have aided in the work in different ways.

Part I of the present volume is a report showing the work done and the progress made since the Survey was established by an act of the Legislature passed in February, 1897. So much work was to be done that the difficulty was in deciding where to begin. A commencement was made, however, and the report shows a very creditable quantity of work accomplished, with a moderate expenditure, the State Geologist and his assistants having been evidently judicious as well as zealous in their labors.

Besides this general report, Mr. White contributes to the volume special papers on "Levels Above Tide," and on "Petroleum and Natural Gas," the latter an important work. Mr. R. U. Goode furnishes a paper on "Magnetic Declination."

"Memoire sur les Phosphates Noirs des Pyrenees." Par David Levat. Paris, France; Veuve Ch. Dunod. Pages, 100; with plates.

In this excellent monograph, M. Levat says that his attention was first called to these phosphate deposits early in 1898, when he found them a point some 30 km. south of Oloron in the Lower Pyrenees. Since then he has traced them eastward and northward into Languedoc, in the departments of Ariège, Haute-Garonne, Aude and Tarn. Their stratigraphical position is in the Upper Devonian, at the junction between the Griotte marble and the overlying carboniferous or permian shales. They form a regular bed 8 to 10 m. thick, and are of a lustrous black. Hence they have been miscalled impure anthracite, graphite-beds and other misleading names. In its richer portions, the bed is characterized by the presence of flattened nodules, hard, black and shiny; these consist of nearly pure phosphate of lime; the assays showing 62 to 77 per cent. of tribasic phosphate. The nodules are generally grouped either at the floor or at the roof of the bed, and the enveloping gangue is itself phosphatized. The latter contains a quantity of organic material, yielding 0.3 to 0.5 per cent. of organic nitrogen. After sorting out the rich nodules, the residue still contains 14 to 16 per cent. of phosphoric acid, which makes it very suitable for agricultural purposes.

The fact that the bed continues to be rich in phosphate down to great depths has been proved by the workings in the manganese-mine of Las

Cabesses, where the nodule-layer is exposed in a level at 110 m. below the surface. The Picardy phosphates, which are in pockets (in the chalk) and the Quercy phosphorites, which form groups of veins, are occurrences essentially different from that above described. The industrial value of these Pyrenean phosphates depends almost entirely on the question of providing transportation at a moderate cost.

BOOKS RECEIVED.

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

"Agricultural Statistics of New South Wales; Preliminary Tables." By T. A. Coghlan, Government Statistician. Sydney, N. S. W.; Government Printer. Pages, 12.

"Sixth Biennial Report of the Bureau of Labor and Industrial Statistics of Nebraska; 1897-1898." Sidney J. Kent, Deputy Commissioner. Lincoln, Neb.; State Printers. Pages, 1,188; illustrated.

"Geological Survey of Canada: Shuswap (Map) Sheets of British Columbia." Prepared by George M. Dawson and James McEvoy. Ottawa, Canada, 1898; H. M. Printer. Scale, 4 statute miles to an inch.

"The Gold Measures of Nova Scotia and Deep Mining." Paper read before the Canadian Mining Institute, March, 1899. By E. R. Fairbault. Ottawa, Can., Printed for the Author. Pamphlet. Pages, 12, with maps.

"Annual Report of the Minister of Mines of British Columbia, for the Year Ending December 31st, 1898." J. Fred Hume, Minister of Mines. Victoria, British Columbia; H. M. Printer. Pages, 273; illustrated. Price, 50c.

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 will only be published when so requested.

Letter should be addressed to the MANAGING EDITOR

We do not hold ourselves responsible for the opinions expressed by correspondents.

The Invention of the New Cement Burning Method.

Sir: In that valuable work, "The Mineral Industry," Volume VI, page 107, in the article "Cement," the new method of burning the cement rock for the manufacture of hydraulic cement is described and credit is given to Mr. Ransome of England for the invention. In looking at the dates of my patents, which I enclose, you will see that my application for the new process was filed March 18th, 1895. The claims were as follows:

"Patent 339,673. Henry Mathey, Manufacture of Cement.—1. The process for making cement, which consists in first crushing the rock to a suitable degree of fineness, then subjecting the rock thus crushed to heat in a revolving cylinder, whereby each particle of the rock is subject to a heating action sufficient to thoroughly calcine it, and finally pulverizing the calcined material, substantially as set forth.

"2. A cement made from cement rock, said rock being crushed and then heated under agitation and finally pulverized, substantially as and for the purpose set forth."

March 17th, 1895, the day previous, I had filed my application for a revolving cylinder to burn the cement rock. It was erected at Rondout-on-the-Hudson in 1895, under my supervision, and the success of the new process was demonstrated. The best Rosendale cement ever produced was manufactured, the tensile strength being three times greater than by the old process; however, on account of the rock carrying too much magnesia, the cement was not as strong as the Portland cement. Before leaving New York to go and take charge of the Temescal Mine in Southern California, I sold my interests to Mr. J. F. de Navarro, who erected a plant in Pennsylvania and organized the Atlas Cement Company. This company, as you know, met with an enormous success, and it is now manufacturing yearly over 2,000,000 barrels of the highest grade of cement, and it is still increasing the plant. Mr. de Navarro by his energy, skill and perseverance, is entitled to the great commercial success of the new process.

From the records it would seem that I am the inventor of the process, and would ask you, as an act of simple justice, to kindly mention my name in connection with the new process in the new issue of "The Mineral Industry."

Henry Mathey.

■New York April 27, 1899.

The Alluvial Leads of Western Australia.

Sir: A paper on "The Alluvial Deposits of Western Australia" was read before the American Institute of Mining Engineers at the Buffalo meeting in October, 1898, by Mr. T. A. Rickard, State Geologist of Colorado. The paper is an interesting one, for it gives a good description, with excellent illustrations, of the method of "dry blowing," by which the miners of Western Australia recover the detrital gold from the alluvial deposits. Mr. Rickard's theories as to the origin of these deposits are, however, in my opinion, so opposed to facts that I venture to crave space in your valuable paper to refer to them. The following is an extract from Mr. Rickard's paper:

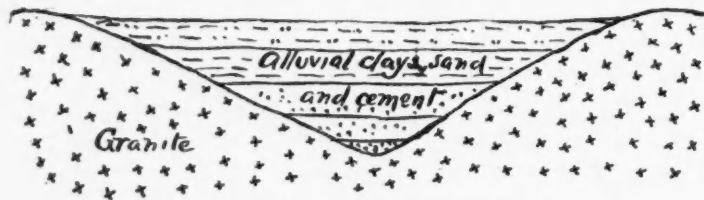
"Of course several Theories of Origin have been mooted, the most fanciful of which have naturally been those of the working miner himself. The fact that the gold-bearing cement is in places overlain by a considerable thickness of partially consolidated rock has led to the supposition that the deposit was a 'deep lead.' . . . But because this alluvium disappears under an over-burden of rock (using the word in a geological sense) the Australian digger easily fancies he is working a deposit similar to the 'deep leads' with which he became familiar at Ballarat, for example. A distinguished Government geologist from a neighboring colony visited Kanowna in October, 1897, and gave author-

ity to the term 'deep lead' by using it himself. 'Deep' it may be, for that is a comparative adjective, but a 'deep lead' in the technical sense it most assuredly is not. On the Forest Hill Divide, in Placer County, California, and at Creswick, in the Ballarat District, Victoria, the typical 'deep leads' occur. They are, as is well known, old (Miocene) gold-bearing river channels, which have been saved from erosion by a cap of lava. The lava probably overflowed the original surface as a steaming mud, and is now found consolidated into a volcanic rock sufficiently hard to need little timbering when penetrated by underground workings. The cement deposits of West Australia occur under an overburden of 'made ground'; that is to say, both the deposit itself and all the material under which it dips are of distinctly detrital origin, the products of weathering and erosion accumulated in shallow depressions of the much decomposed surface of granite or diorite.

"It is the placer of a country destitute of running water. The climatic conditions and the physiography of the Coolgardie Gold-fields have been carefully described in order to make it evident why these deposits differ from those of more favored countries, like California or New Zealand. Surely it is not in keeping with the scientific method to seek for fantastic or far-fetched explanations, when processes in operation to-day are able to supply an adequate understanding of the observed facts. The quartz of the cement is subangular; it has evidently undergone very little attrition, and suggests therefore that it has not travelled far. On comparing it with the matrix of neighboring veins, an identity appears obvious. The examination of the topography renders highly probable the derivation of the one from the other. . . . The comparatively unclassified condition of the deposits is in keeping with the evidence afforded by the material of which they are composed. The absence of running water on this desert plateau has prevented any such sifting-process as in other regions leads to the deposition of well defined layers of clay, gravel and gold upon a clean bed rock."

I might remark, in the first place, that the use, by Mr. Rickard, of the term "alluvial deposits" in the title of his paper is scarcely consistent, in view of his contention that running water has had no part in the formation of those deposits. I must also take exception to the writer's implied suggestion that all the "deep leads" of Australia are overlain by caps of lava. The deep leads of Australia are of Eocene, Miocene, Pliocene and Pleistocene age, and many, but not all, of the old (Tertiary) alluvial deposits are overlain by basalt, which overflows the surface not as steaming mud, but as molten lava.

If Mr. Rickard's experience of the geology of Victoria had been more extended he would have been aware that, amongst the most productive



SECTION OF WEST AUSTRALIAN DEPOSIT.

auriferous deep leads of that colony, are those to the north of Rutherglen, near the Murray River. These leads have already been exploited to a depth of 400 ft., and they have no covering of basalt; moreover, the quartz pebbles with which the gold is associated are more or less subangular (as many of them are in the West Australian deep leads) and they are covered by 400 ft. of "made ground," of indisputably alluvial origin.

In October, 1897, I found some distinctly water-worn pebbles in the Kanowna (West Australia) deep lead, and subsequently when the "jumping" cases in connection with the Ivanhoe Venture Syndicate leases were being heard in the Warden's Court, Mr. Maitland, the Government Geologist of Western Australia, produced some water-worn pebbles, and stated in evidence that they supplied proof that the deposits were distinctly alluvial, or formed by the action of running water.

Mr. Rickard gives a sectional sketch of the Kanowna lead, but it is, in my opinion, incomplete and misleading, inasmuch as it represents the bed rock (granite) and overlying detrital deposits as being all approximately horizontal, thus implying that the deposits do not occupy an old valley, which, however, they most assuredly do. On either side of the deep ground the bed rock, consisting of granite or felspar-porphyr, rises towards the surface so that a section across the lead would be properly represented by the accompanying sketch.

The leads have already been worked to a depth of 120 ft. Since Mr. Rickard's visit the deep leads have been considerably developed, and quite a system of tributaries have been worked, showing that the leads present similar features to those of the Eastern colonies, or to any recent system of drainage channels.

With regard to the writer's reference to "the comparatively unclassified condition of the deposits," it may interest him to know that a bed of about 7 ft. thick of clay, known locally as pug, has been found in one of the Kanowna leads. This pug is auriferous, and in one specimen of it I have observed very minute isolated octahedral crystals of gold, with perfectly sharp edges, from which it may, I think, be inferred that some at least of this gold has crystallized from solution.

I fail to understand how any geologist can regard as "fantastic" or "farfetched" the opinion that the ancient valleys of Western Australia are, like those of other parts of the world, valleys of erosion. On the contrary, I think that Mr. Rickard's views may be reasonably termed near-sighted, inasmuch as he, apparently, bases them on the assumption that the existing climatic conditions of West Australia have endured for long periods of geological time. As a matter of fact, there are very strong reasons for believing that in tertiary times the rainfall over this part of the world was very much greater than it is at the present day. This is shown in the Eastern colonies by the very much greater width of the ancient river beds, as compared with the beds of the existing rivers. And in Western Australia there is also evidence of a diminishing rainfall. Between the Boulder and Hannan's Lake a modern creek, which runs only after rain, has cut its channel through a thick bed of ferruginous conglomerate of fluvial origin. But apart

from such surface evidence, does not the very existence of old valleys (now filled up) afford clear proof, ipso facto, that a greater rainfall than now obtains was necessary for their erosion, and does not the fact of their having been filled up by deposits of clay, etc., point to a gradually diminishing rainfall in later times?

The present rainfall over considerable portions of Western Australia is undoubtedly small, but is it so certain that even it is too small to have some effect in the production of alluvial deposits? Mr. Rickard quotes, in considerable detail, the meteorological conditions, including rainfall, at Coolgardie and Kalgoorlie, in the year 1897, but he omits all mention of the figures for 1896. Now, although the rainfall at Kalgoorlie for 1897 was only 4.75 in., it was 9.54 in. for 1896. Moreover, in 1896 4.79 in. of rain fell at Kalgoorlie during the month of March. The official records do not show in how many days these 4.79 in. fell, but several of the oldest residents of Kalgoorlie informed me that this rain all fell in about a week. Surely, with the knowledge of such a fall, there is nothing "fantastic" or "farfetched" in the idea that detrital deposits may, even yet, be formed there by the action of running water!

In conclusion I may state that in my opinion alluvial gold mining in deep leads will yet be a very important industry in Western Australia.

Edward F. Pittman,

Government Geologist of New South Wales.

Sydney, N. S. W., March 26, 1899.

THE PHOSPHATE INDUSTRY.

The phosphate industry of this country is in very good condition to-day; prices are almost the highest on record, and exports, especially of high grade rock, show a marked increase. In the first quarter of this year the exports from the United States amounted to 179,114 long tons, of which more than half was Florida rock, the remainder being land pebble, South Carolina and Tennessee phosphates. The distribution of these exports was largely among European countries, particularly Germany and Holland. In the case of Florida high-grade rock the total shipments to foreign and domestic ports for the quarter ending March 31st, 1899, amounted to 104,141 long tons, or nearly 31 per cent. more than for the corresponding period in 1898. At this rate the shipments in 1899 will amount to fully 400,000 tons, as against 360,505 tons in 1898, and 350,277 tons in 1897. The largest consumer of Florida high-grade rock is Germany, which will doubtless take one-half of the total exports this year; and of the shipments to Rotterdam, Holland, a considerable part will go into consumption in the interior of Germany. Belgium held third place last year, but the United Kingdom is now taking a larger quantity. There have been several shipments to Australasia and Japan. The consumption in the United States is improving.

An appreciable increase in exports of Tennessee phosphates will also be shown at the end of 1899, as the movement in the first quarter amounted to about 18,600 long tons, a large increase over last year.

There are prospects for a still larger export trade, especially with Germany, as little or no high-grade rock such as we send abroad can be secured anywhere else. Our high-grade stuff contains from 75 to 83 per cent. bone phosphate of lime, while the Algerian carries only from 63 to 70 per cent. Consequently, Florida high-grade rock is selling at about \$15 per long ton, c. i. f. United Kingdom or North Sea ports, and Tennessee at \$12.64, while the Algerian product brings about \$10 per ton for same deliveries. Our Florida land pebble, which contains from 68 to 73 per cent. bone phosphate of lime, sells abroad at about \$11.20 per long ton, and Florida Peace River at \$9. The average rate of freight from our Southern ports to European ports is about 17s. or \$4.08 per long ton.

IRON PRODUCTION IN BELGIUM.—The production of pig iron in Belgium in March was 116,660 metric tons. For the three months ending March 31st it was 306,850 tons, as compared with 242,670 tons in 1898, showing an increase of 64,180 tons this year.

SWEDISH IRON ORE FOR GERMANY.—It is reported that the owners of the Gellivara iron ore mines in Sweden have offered to supply all the iron ore required by the Upper Silesian pig iron makers during the next six years, on the basis of 15 marks (\$3.57) per ton f.o.t. Stettin for 60 per cent. ore. This is an advance on the price at present being paid.

A VENERABLE LOCOMOTIVE.—An old engine, No. 25, the "Derwent," built for the Stockton & Darlington Railway Company in 1837, by Messrs. Kitching, at Darlington, has been just placed alongside Stephenson's No. 1 at Darlington railway station. The "Derwent" was worked down to a very recent period, at Peases' West Colliery, says the London "Colliery Guardian."

THE REFORM OF THE RUSSIAN CALENDAR.—The rumor that appeared in the European press a few weeks ago that the Russian Government was taking measures to reform its calendar has been confirmed. By June the new way of reckoning time will be ready for the approval of the Russian Cabinet, and it is believed that the system will be promulgated in the form of an imperial manifesto almost immediately after, as the Czar and his Government are known to approve of the plan. It seems that a committee of the St. Petersburg Astronomical Society was appointed to examine the question at the beginning of the year. The committee applied to all the Government departments for their opinion on the subject, and the Ministries of Communications, the Interior, Finance and Foreign Affairs at once replied in favor of the adoption of the proposed reform at an early date. The committee then proceeded with its labors among scientific and commercial boards, and by drawing up its plans of introduction. It is expected the change from the "old style" will be watched with much interest by Central and Southern Europe and by America. Russia has at present the Julian Calendar, never having accepted the reform of Pope Gregory in 1582. Russia will now have to drop twelve days, since the error, as nearly as possible, is one day in each century.

W. Y. CAMPBELL.

It is with deep regret that we have just learned of the death of W. Y. Campbell, which occurred in Lisbon, Portugal, April 21st. Mr. Campbell went to London from Johannesburg some months ago, and early in April went to Lisbon on a financial mission. He had completed his work there, and was just on the point of starting for Paris, when, in some unexplained way, he contracted small-pox, of which disease he died after a few days' illness.

Mr. Campbell was born in Edinburgh about the year 1854. He lost his parents at an early age, and when he was about twelve years old he went to Natal to become an adopted member of the family of Mr. Thomas Duff, a relative. He passed his youth there, and was an earnest student of the public affairs of the colony. He became one of the best native linguists in Natal, and obtained such an insight into native character as ultimately to become one of the leading authorities in the colony on native law and native affairs. In 1877 he took his first trip to England, and in 1878 he started business in West Street, Durban, but other aims prompted an early abandonment of commercial pursuits. He read for the law, and was called to the Natal bar. He practiced successfully at it, and such was the high esteem in which his professional skill was held that at the Government's request he coded the native law of the colony. He was engaged in several celebrated causes, notably in what are known historically as the Zulu trials. He was the adviser, in his latter years, of Cetewayo, the late Zulu king, and to the last ever strove to do good work for the native races of South Africa.

Some twelve years ago Mr. Campbell left Natal for the Transvaal, in spite of many flattering offers to remain in the former colony or in



W. Y. CAMPBELL.

the Cape of Good Hope. He settled at Johannesburg, where he had gone to represent important financial interests in Europe, and from that time on he may be said to have occupied a position in the Transvaal which was altogether unique. Although he was generally recognized as the representative of large Uitlander interests, and although he was always an advocate of British supremacy, he retained the confidence of the Boer leaders, especially of the more progressive, and to his influence was due the settlement of some of the more pressing difficulties connected with the Transvaal government; although unfortunately he was not able to remedy many of the abuses which are so bitterly complained of. Soon after the formation of the Johannesburg Chamber of Mines he became an officer, and was for some time vice-president. He took a deep interest in the prosperity of the Witwatersrand, and was generally regarded as the statistician who could speak with authority on mining matters there. No one was more familiar than he with the conditions which governed the mining industry, and confidence in him was so general that he had access to many facts and statistics which others would have had difficulty in obtaining. This fact will be recognized by those who have read with interest the very valuable contributions which Mr. Campbell from time to time made to the columns of the "Engineering and Mining Journal," and to the pages of "The Mineral Industry."

In recent years Mr. Campbell took a deep interest in the development of the Chartered Company territories. He was for some years managing director of the corporation known as the Gold-Fields of Matabeleland, a position which he resigned in 1896. It is understood that he had consented in response to the request of the authorities to spend the next two or three years in organizing the government of Nyassaland, a task for which he was especially fitted by his thorough knowledge of the native races, his familiarity with the various South African languages, and his high sense of equity and realization of the rights of those people. In fact, he was regarded with the greatest reverence by the Zulus of Natal, the Transvaal and the adjoining regions, and their leaders will sincerely grieve to hear of the death of "Weely"—his native name.

Mr. Campbell was not only thoroughly appreciated in the Transvaal, he had the confidence of investors in England and elsewhere, and was widely consulted on mining matters, and in fact on other matters of every description. He was regarded as a representative Uitlander, and was spokesman upon all occasions. He was an excellent orator, speaking clearly, directly and to the point, and he had the art also of writing in a clear yet concise style which enabled him to convey a great deal of information in a very brief form. He kept open house at Johannesburg, and not only entertained friends and neighbors, but many distinguished visitors. Although he never practiced as a mining engineer, nor indeed claimed to be one, he was generally recognized as an authority on mining questions, on mill management and on the financial management of companies.

Besides the different home associations in which he was prominent, Mr. Campbell was a life member of the American Institute of Mining Engineers, a member of the North of England Institute of Mining and Mechanical Engineers, a Fellow of the Geological Society of London, and a member of the Geographical Society. He leaves a wife and five children, who were in Switzerland at the time of his death.

GOLD IN TORRES STRAITS, AUSTRALIA.

Written for the Engineering and Mining Journal by John Plummer.

The impression prevalent among Australian miners to the effect that gold is abundant in the islands in the vicinity of New Guinea and Thursday Island, has apparently been confirmed by recent discoveries at Horn Island, one of the Prince of Wales group, forming a continuation of the rock formation of the Queensland mainland, north of Cape York. The island is divided from Thursday Island by a narrow but deep channel, about 1½ miles in width. Queensland miners have for some time been aware of the fact that many of the islands were auriferous, gold having been found on the Prince of Wales, Hammond and Possession islands, as well as on Horn Island, the first discovery at the latter place being in 1894, when the island was proclaimed a gold field by the Queensland Government. Communication with Horn Island is by row boat from Thursday Island, the landing place being near the workings. After the field had been proclaimed, a number of leases were pegged out, but the place was speedily discovered not to be "a poor man's field," and the original prospectors were left in undisturbed possession of the auriferous area, which they worked with such persistence that it became necessary to obtain a 5-stamp battery, engine, boiler and Berdan pans. As the work proceeded it became apparent that a rich body of ore had been struck, and the fortunate lease-holders went a step farther and obtained the services of a practical manager from the Croydon (Queensland) gold fields. He speedily ascertained that the country rock contained gold, and at once commenced crushing with such success that another 5-stamp battery had to be secured, and it is now proposed to increase the plant by 30 stamps. The mining, or rather quarrying, is at the base of a steep hill, rising as the work progresses. The excavations extend a distance of nearly 200 ft., the height being about 36 ft., and there is every indication of gold being under foot. With the introduction of suitable machinery the gold-bearing rock can be crushed in larger quantities. The leases have now been secured by a Victorian syndicate, and steps are being taken to procure all needful appliances. The success of the Horn Island miners has led to the systematic prospecting of the other islands. On Possession Island, 12 miles distant from Horn Island, a 5-stamp battery and a cyanide plant are being worked with considerable profit. The Prince of Wales group are situated in the same latitude as the Louisiade Archipelago, in which Sudesh and other gold-bearing islands are found; Woodlark Island, another auriferous locality, being a few miles further north. All these islands are supposed to have originally formed a portion of New Guinea, which was also joined to Queensland by a broad neck of land, of which Thursday Island, the Prince of Wales Group and other islands are the remaining vestiges. The wild mountainous character of most of the islands, several of which are covered with dense forest jungle, a vast hot-bed of malaria, has hitherto, as in British New Guinea, impeded the systematic work of prospecting, but with the progress of settled government, clearing and drainage, the real extent of the auriferous wealth in these islands will become more correctly estimated.

PULSOMETERS IN A ZINC MINE.

At the Samuelsgluck Zinc and Lead Mine, near Beuthen, in Upper Silesia, the deposit, a nearly horizontal bed of dolomite containing blende, galena and pyrites, was interrupted at a point 500 m. from the main shaft, by a fault which was proved by boring to have a down-throw of 90 m., as described in the "Proceedings" of the British Institution of Civil Engineers.

As the depth from the surface (75 m.) was too great to bear the cost of an entirely new shaft, the sinking to recover the deposit was started from the end of the main level, a distance of 662 m. from the bottom of the main shaft, a rise of about 7 m. being cut out to give room for the head gear of the winding engine. This shaft, about 3 m. square, was kept dry by the kibble down to a depth of 10 m., when, more power becoming necessary, it was decided to use a pulsometer, the steam being brought from the receiver of a pumping engine at the bottom of the main shaft by a covered pipe along the main roads of the existing workings. This has a total length of 820 m., and is 10 cm. in diameter, with copper expansion bends and steam drainers at intervals of 100 m., the whole of pipe, as well as receiver, being covered with an insulating coating of infusorial earth. The pulsometer was mounted on a guide frame, and slung by a tackle from the pit frame like an ordinary sinking lift. It lifted 2 cubic meters of water per minute from the bottom of the sinking down to 20 m., when it was drawn back and fixed at 15 m., a second one being added as a sinking lift. The ore bed was cut at 23 m. and proved to be 4 m. thick, which, together with a sump of 3 m., gave a total of 30 m., the second pulsometer being lowered to the bottom to divide the lift. For drawing the ore from the bottom workings a double 8 by 10½-in. cylinder con-

condensing engine, having cylinders 200 by 265 mm., with cylindrical-gear drum and cages lifting 1,500 lbs. net load, has been provided, taking steam from the same supply.

The pulsometers worked well, but the upper one required frequent cleaning, owing to the deposit from the heated water from the bottom lift blocking up the holes in the diaphragm, through which the condensing water is injected into the steam chambers, and so stopping the working. As the stoppages were attended with the temporary drowning of the bottom level, and a second communication being necessary for ventilation and lowering timber, a new shaft has been sunk 40 m. distant from the first, in which two Rittinger pumps, driven by bell cranks from a condensing engine, have been erected. These have a total capacity of 4 cu. m. per minute, and have actually lifted 2.5 cu. m. for the last six months. The steam is brought by an extension of the same line of pipes from the receiver supplying the winding engine. The ore lifting in 24 hours now amounts to 310 wagons of blende of 1,500 lbs. weight each—232 tons for 3,600 tons of water.

The cost of the machinery and steam pipes for the new shaft was \$4,454, divisible as follows: Winding engines, headgear, cages, etc., \$1,032; pulsometers, suspension frames, rising mains and steam connections, \$2,574; main steam pipes, and coating expansion joints, water traps, etc., \$1,400; erecting and small stores, \$408.

This is considerably less than would have been required by any other method of transmission, and economy of fuel is a comparatively unimportant matter, the cost of dust coal of inferior quality as used at the mine being 62c. per ton. Originally there were seven boilers, six of which were generally in use, giving steam at 5½ atmospheres for the supply of the winding and pumping engines and dressing machinery. When the new sinking was begun another boiler was added, and this has been sufficient to supply the additional steam. The loss of pressure in the underground steam pipes was at first about two atmospheres, giving 3½ atmospheres at the receiver; but this has since improved, as notwithstanding the increased length of pipes the pressure available at the Rittinger pumping engine is 4¼ atmospheres.

COAL AND COKE IN MONTANA.

Written for the Engineering and Mining Journal by Fred D. Smith.

Three counties furnished practically all of the coal mined in Montana during 1898—Carbon, Park and the adjacent parts of Gallatin, and Cascade County. The last named leads all others with a production of 993,261 tons. This was due to the large scale on which the Anaconda Copper Mining Company mined coal for its own consumption and for its coke. Carbon County, with the mines at Red Lodge, where the principal operators are the Rocky Fork Coal Company, produced a total of 271,496 tons. Park County, with mines at Horr, where are located two of the three coking plants of the State, made a good showing with 121,565 tons. The mines in Gallatin County adjacent to the coal properties of Park County, produced some coal, but extensive mines will become shippers early in 1899 and give this county a better standing. The mines at Chestnut will probably become the most noted of the new properties. Among the scattering mines are found some producing properties at White Sulphur Springs, Meagher County; Chinook, Chouteau County, and Augusta, in Lewis & Clarke County. In these latter cases the coal is of poorer quality and finds its use only in the local trade.

Owing to the good market for coal in the cities of the State, and for coke, if the coal is suited, the price of the coal at the mine generally is \$2 per ton, though in some cases the operators claim \$2.50 and \$3 as the value at the mine. Incomplete figures in detail make it possible to judge that \$2 is not a fair estimate of the cost per ton for production, it being too high.

The labor account shows much of interest. While not all companies have furnished figures for labor, yet accurate figures for the major portion of the output can be given. A total of 883,826 tons mined cost for labor \$890,827, giving an expenditure of \$1.01 for labor for each ton of coal.

The total output for the year was 1,450,471 tons, of which 143,338 tons were used for coke. The estimate given in the "Engineering and Mining Journal," January 7th, 1899, was 1,367,800 tons. The values, as given by the producers, amounted to \$1,902,251; an average of \$1.31 a ton.

Three companies alone produce coke in the State, the Anaconda Copper Mining Company, with mines and ovens at Belt; the Montana Coal and Coke Company, with mines and ovens at Horr, and the Butte & Yellowstone Coal and Coke Company at Horr. But one company ran its plants to the full capacity in 1898, putting in 309 days worked, while one ran but 203 days. The Anaconda Company suffered the loss of its washer after 3½ months run on full time. The operating capacity, then, was 103 ovens for 203 days, 15 ovens for 309 days and 100 ovens for 105 days. All use the bee-hive ovens. In the case of the Montana Coal & Coke Company nearly all of the coal mined is used directly for coking.

An interesting study is the amounts of coal lost in washing and the coke produced per ton of coal used. In the case of the Belt coal of the Anaconda Company, 1.97 tons are reduced to 1 ton by washing, and a yield of 1 ton of coke for every 2.23 tons of washed coal, or for 4.39 tons of coal, unwashed, is obtained. The Montana Coal & Coke Company makes one ton of coke from 1.69 tons of coal, though it is not stated whether this figure represents washed coal or not. The Butte & Yellowstone Company make 1 ton of coke from 1.66 tons of coal, though it is not stated if this represents washed coal or the crude product. The yield per oven per day is as follows: For the Butte & Yellowstone, 1,604 tons; for the Montana Company, 2,564 tons, and for the Anaconda Company, 0,877 tons.

The value of the coke as well as for the coal used in making it is computed at the selling price f.o.b. cars, which for coke is given by the Butte & Yellowstone Company at \$7.50, and by the Montana Company at \$8.

There was a total tonnage of 70,234 tons of coke made from a total of 143,338 tons of coal, showing an average of 2.04 tons coal used in making a ton of coke. To coke the coal a total of \$58,872 was paid for

labor, while the coke thus produced had a value of \$529,825. The estimated output given in the "Engineering and Mining Journal," January 7th, 1899, was 70,000 tons.

THE GROWTH OF THE PAVING BRICK INDUSTRY.

According to Mr. H. A. Wheeler, in an address made at the last meeting of the National Brickmakers' Association, the introduction of shale for paving brick started at Peoria, Ill., which State has an abundance of shale, but scarcely any other paving material. The shales gave varied results, but enough good results were obtained as to show that with proper care and discrimination excellent pavers could be made from shale. The use of shale introduced the new element of overburning ruining the product, which was unknown in the pioneer fire-clay plants, as with the latter the harder the burn the greater the percentage of first-class pavers. It was also found that shale required much more care in the speed of watersmoking and burning, while the margin was found usually quite narrow between the brittle, glassy, overburned or sewer brick and soft underburned or building brick.

The experience of the Illinois brick yards with shale stimulated efforts in Nebraska, Kansas, Missouri, Iowa, Indiana and Ohio to utilize the local shales, which were abundant in these States, and many local trials were made of these shale-pavers by the smaller cities and towns with very varied results. The costly experience had again to be learned that while shale is shale, it is like all other kinds of clay, in that no two are exactly alike, and each has its individual peculiarities that affect the manufacture and the quality of the product. Also that shale adopted for economically producing a high-grade paver is by no means abundant.

The early shale experiments were also made in yards that were mainly equipped with up-draft kilns, and the temptation to sort too favorably into the higher-priced pavers resulted in too many underburned bricks being shipped in trying to get a reasonable percentage of paving grade from the central portion of the kiln. While down-draft kilns greatly increased the cost of equipping the yard, it was soon found necessary to adopt this style of kiln for successfully making paving brick if the quality of brick and the cost are considered.

The increasing number of favorable experiments of paving brick on the street early attracted the attention of the progressive clay machinery manufacturers to the opening up of this new field, and the application of their brains and experience led to many improvements in the quality and diminishing the cost of the brick, not the least of which was the early introduction of well laid out artificial tunnel dryers, which resulted in marked improvement in regularity and amount of the output with consequent lessening of cost.

As paving brick began to win their way and open up an attractive market the attention of manufacturers was drawn to the growing industry. In 1894 there was one plant in Galesburg, Ill., that had an annual producing capacity of 60,000,000 brick, with a capital of \$500,000.

The users of paving brick were at first confined to the smaller places, which were only too glad to avail themselves of an excellent paving material that came within their moderate means, and as soon as enough experience had been gained to verify the durability of good paving brick, its use rapidly spread through this class of consumers. But in the larger cities where much of the property can afford the best of pavements characteristic conservatism, the opposition of established contractors of other paving material, and the complications and vicissitudes arising from hungry political factors made the advent of paving brick slow and difficult, so that it has only secured a safe foothold in the large cities within the past five years. But the accumulation of experience, the improvement of quality and the better understanding of the manufacture and testing of paving brick by engineers has finally resulted in paving brick securing an accredited, assured position in its proper place in every city in the United States that it can reach on reasonable terms. While the early enthusiasts would have had every other kind of paving material give way to brick, its eminent merit needs no such sweeping statement, as no paving material has yet been found that possesses all the qualifications of an ideal paving material to a maximum degree. But the very easy traction, freedom from dust, low cost, slight repairs, durability, eminent sanitary character, ease of tearing up, suitability for steep grades and much less noise than stone, assures paving brick of a very large field in the largest as well as the smallest cities.

SWEDISH IRON ORE EXPORTS.—The aggregate exports of iron ore from Sweden during the past year amounted to 1,439,872 tons, as compared with 1,400,399 tons in 1897.

LIQUID FUEL FOR STEAMSHIPS.—In a recent note London "Engineering" says that for marine use oil fuel has exceptional advantages. Smoke can be entirely got rid of, and the stokehold staff reduced, whilst the work of those left is reduced to watching gauges and turning a hand-wheel or two. Again, in practice, 1 ton of oil seems to be equal in evaporative efficiency to 2 tons of the commoner steam coals. On the other hand, the latter require a bunker space of 90 ft., while the ton of oil occupies 38 ft. only. Under Lloyd's regulations oil of 200° F. flash may now be carried in the water ballast tanks, from which it can easily be distributed to service tanks feeding the boiler furnaces. The ease with which oil fuel can be placed on board is another point in its favor, 300 tons being easily loaded in an hour, and without dirtying the ship. To secure complete combustion it is, however, necessary that the oil should be finely sprayed on entering the furnaces. This used to be done by steam, but with the Kloss system, as described in Sir Marcus Samuel's paper read before the Society of Arts on March 15th, compressed and highly-heated air is substituted. The oil also is raised to 200° F. before issuing from its nozzle. Under these conditions very perfect combustion is secured. The air is supplied at a pressure of 50 lbs. per square inch, and is heated to a temperature of 500° F. by passing it over cast-iron plates fixed in the furnace.

LABOR-SAVING DEVICES IN USE AT A PENNSYLVANIA ANTHRACITE MINE.

Written for the Engineering and Mining Journal by L. C. Morgenroth.

The early history of coal mining was one of prodigality. When coal was easy of access, with a demand that was greater than the rapidity with which it could be supplied, and an apparently unlimited supply, a wastefulness that was inexcusable was indulged in. Veins were but partially worked. Only that coal was mined which could be obtained with the least trouble, and it was often done in the most unskillful manner, an enormous percentage of it being lost through gross carelessness or greed on the part of the operators themselves. But this manner of working could not be kept up indefinitely. Each year operations add to the cost of mining, hauls becoming longer, with an increased expense in motive power, coupled with more trouble and expense in procuring the coal. Eventually the operations had to be extended to greater depths beneath the surface, necessitating expensive hoisting and pumping machinery, with increased cost of maintenance, increased difficulty in mining, with increased danger, improved methods of ventilation, with a corresponding increase in cost.

In the old days the most successful operator was he who could turn out the greatest quantity of coal in the shortest time, irrespective of

ceptible to derangement, one that causes the most trouble, gives the foreman more worry than any other, requiring his constant personal attention to keep in perfect condition. It is the most expensive of all the various departments, this expense increasing in a surprising way as the colliery increases in size.

The intention of this paper is to emphasize the importance attached to the details of each and give a few examples of the ingenuity from a mine visited a few months ago. The most important features of the various devices in use were their simplicity, the thoroughness with which they performed their work and the cheapness in construction. All these various contrivances were inexpensive in themselves, and all had been made at the mines by the mine blacksmith.

The mine in question was first opened up by means of a tunnel driven in the side of the mountain (See Fig. 1), the tunnel being 1,200 ft. long and cutting the vein at a depth of 280 ft. beneath the surface. At present this body of coal above the tunnel level has all been worked out within the limits of the colliery, the operations now being conducted in the next lift below. Access to this lower level has been gained by sinking a shaft at the head of the tunnel down a distance of 265 ft. The hoisting machinery and boiler plant are placed on the surface, as shown in the figure, a hole driven in one of the veins being used as a rope way. The mine cars are hoisted only to the level of the tunnel, where the empty cars are also delivered to the shaft. A small mine locomotive

Fig. 1.

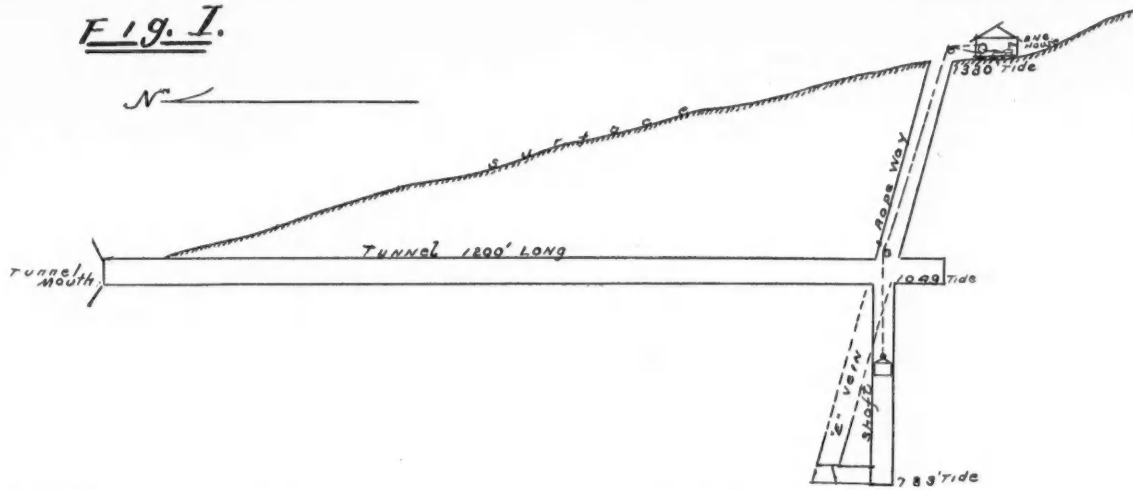


Fig. 2.

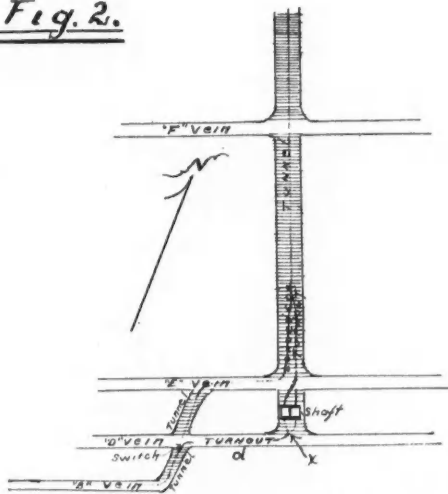
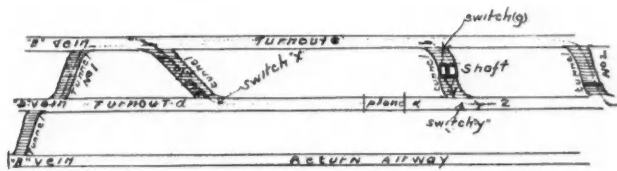


Fig. 3.



Track shown in Red
DRIVEN IN ROCK
Crosshatched
Coal Open

LABOR SAVING DEVICES AT AN ANTHRACITE COLLIERY.

the future of the operations. At the present day the mine manager most in demand is he who is not only able to grasp the large intricate problems connected with mining, but also realizes the importance of the details.

To counteract waste, it has become necessary to render the subdivision of the overseeing as small as possible. This has been accomplished by making each miner a petty contractor himself, paying him by the amount of work he does; he, in turn, purchasing his own supplies, directing and paying his own laborers. While this method has the advantage of shutting off the wastefulness of a large portion of the employees, there is the disadvantage of the subdivision of the work into numerous small undertakings, each small contractor pursuing to a certain extent methods of his own, entirely independent of his neighbors, with a consequent detriment to the effectiveness and economy of the mining in its entirety. Of course these miners are under the direct supervision of the mine foreman, and must follow his instructions and plans, not being left to do entirely as they see fit, but this supervision can only be in a general way.

All portions of the work of the mine cannot be contracted in this way, though by putting all miners on this system the major portion of the waste is stopped; there is still sufficient left to exercise the ingenuity of the foreman in the prevention of undue expense.

The operation of most vital importance in mining, that is as an accessory to the direct mining of coal, is in the delivery and movement of the mine cars. It is a division in the labor of mining that is most sus-

pulls them out of the tunnel and an additional distance of 1,400 ft. to the breaker.

Fig. 2 is the plan of the arrangement of tracks at the head of the shaft. It is unique in the manner in which it has made use of existing openings, which had been driven in the working of this upper lift, no extra expense being gone to in driving new openings. With the exception of a few slight changes in the grades at various points, the old roads were perfectly satisfactory. The locomotive pulls the empty cars in the tunnel, thence in the E vein, through the tunnel, crossing the D and into the B vein far enough until the last car of the trip has passed the switch in the vein. The cars are now backed into the empty car turnout marked d in the sketch. The locomotive now runs out the way it entered, thence into the loaded car turnout in the main tunnel, being attached to the cars that are standing there, pulling them out the tunnel and delivering them to the breaker. The empty cars run by gravity from the turnout in which they are placed to the shaft, being placed in alternate cages by the turning of the switch, marked x on Fig. 2. The loaded car bumped off the cage by the empty one that is to take its place, runs by gravity to the loaded car turnout.

Fig. 3 is the plan of the arrangement of tracks at the bottom of the shaft. The empty cars pushed off the cage by the loaded one to be hoisted follows the direction of the arrow to z. The track from the shaft to the switch y being a descending grade, the momentum the car gives will carry it up the ascending grade from y to z. The switch y being automatic prevents the car from running back to the shaft, but

causes it to take the track to the foot of the plane. Here a chain hoist run by a small 10 H. P. engine pulls the car up the plane, a distance of 65 ft, with a vertical height of 14 ft. From the head of the plane to the turnouts the grade is descending, the cars running themselves, and they are allowed to collect on either turnouts, d or t, by the setting of the switch x. Those collected on a forming the trip for the workings on the west of the shaft, while those on t are for the east side workings. The loaded cars from the west are pulled in through the D vein and thence run through the tunnel, marked No. 1, to the loaded car turnout, marked e. Those from the east side are placed on the same turnout. The grade, a descending one from this turnout to the shaft, the cars run by gravity and are placed on either cage by means of the switch g.

The manner in which the colliery is worked is simple. Three veins are worked. On account of their proximity they are mined in conjunction with one another, the veins being connected by tunnels driven every 600 ft. The section of the vein lying between any two tunnels is always worked out before the section ahead is touched. This method has all the advantages to be derived from the concentration of work and men, an important one being the increased efficiency in the ventilation. The length of road to be maintained in either of the side veins is not greater than 600 ft., this piece being moved ahead as the section is worked out and a new tunnel has been driven. The main haulage road is in the middle vein.

The air from the down-cast shafts used in the ventilation is carried to the working forces by two of the gangways, the third being used as the return. It is carried in as far as the last breast opened, where a door deflects it up this breast, from where it is carried across the faces of all the other working places in that section and then by means of an over-

roads are at the frogs necessary for the branches and turnouts. It is there where the most accidents occur, where the greatest delays are caused. On account of the sharp curves necessary in the roads of a mine, the frogs used have an extremely large spread and their very shape is conducive to their quick destruction. At the top and bottom of the shaft to and from which the cars run by gravity, it is of the utmost importance that the movement be regular. The grades must be such as to allow the cars to run with sufficient speed to be delivered to and taken from the cages consistent with the rapidity of the twisting. A prominent cause of these delays is worn and blunted frogs, and one remedy is the substitution of improved frogs. Figs. 4 and 5 are examples of those in use at the top and bottom of the shaft respectively. The regular frogs previously used were continually giving trouble; the points grinding off rapidly, left a gap which caused the cars in their movement to stop at these places, making it necessary to have several men to start them. New frogs were required monthly until the devices shown were substituted. These, the first ones used, have been in constant service for three years and evidently will last as many more. Both have done away with the point so rapidly worn, and with the exception of a crack no larger than at an ordinary rail joint, have preserved the continuity of the rail.

Fig. 4 is a plan of the frog in use at the top of the shaft. The cars run from the turnout and are placed on the east or west track alternately by the turning of the switch shown. The movement is in the direction of the arrows; x and y are two blocks of wood, with the edge that extends over the rail faced with strap iron. These blocks are pivoted at f and f' respectively and are rigidly connected by the U-shaped piece of iron c, so that one cannot move without the other. At the cen-

Fig. 4.

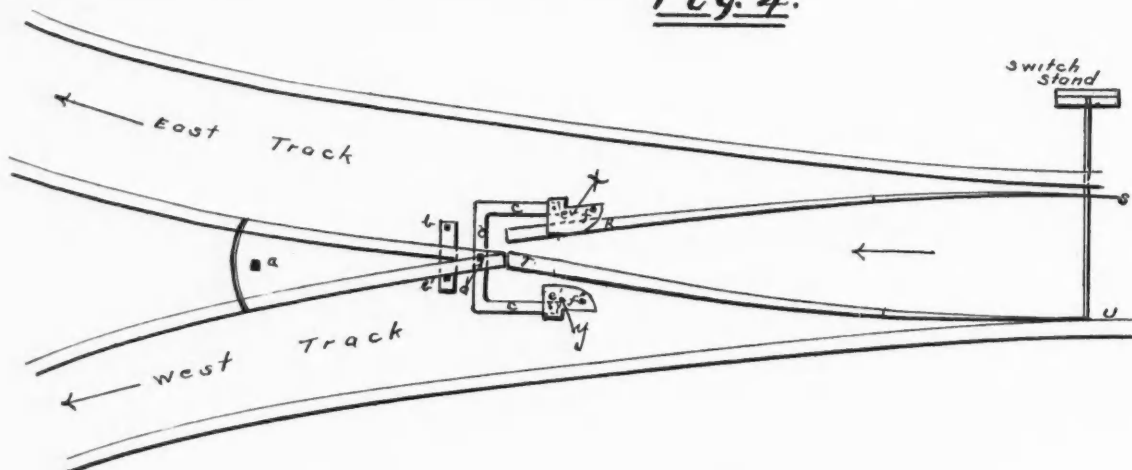
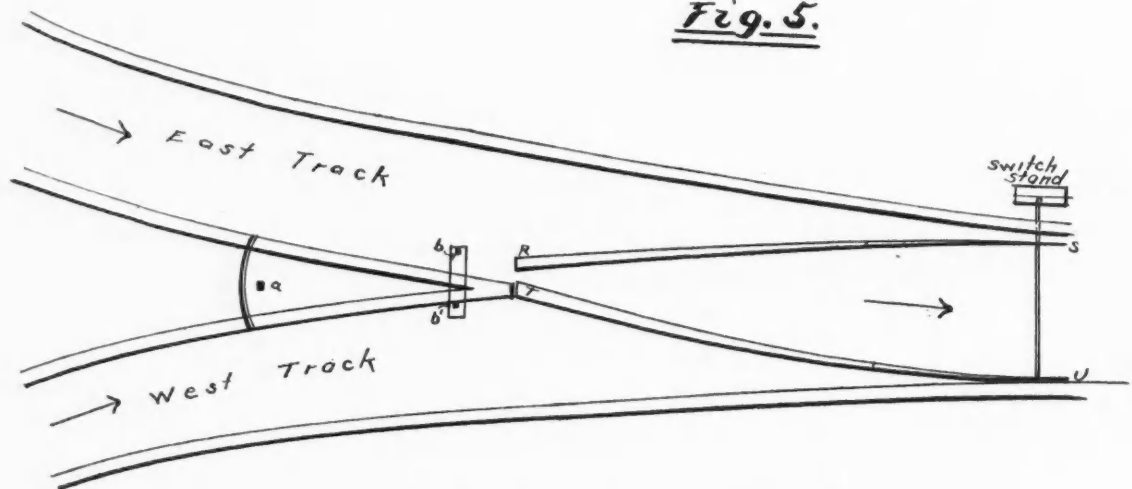


Fig. 5.



LABOR-SAVING DEVICES AT AN ANTHRACITE COLLIERY.

cast into the return airway. A small wooden air pipe from the door to the face of the gangway provides sufficient amount of air for the men working here. The face, as a rule, is but a short distance ahead of the last breast. The section in which men are working in the return airway is provided with fresh air by means of a regulator placed in the last tunnel driven, the return air from the other veins being admitted far enough back not to interfere.

Instead of sending the many tools used in the underground operations to the shops, located on the surface, to be sharpened, time has been economized by the establishment of several small forges in the mines. The forges, being temporary, can be moved from time to time to where they are in the most need. A novel feature in the furnishing of a blast for these fires has been in the use of the ventilating current. The shop is set up in some disused tunnel—in a place where there is the least liability of fire, no timber being in close proximity—is connected to the return airway. The pipe which furnishes the blast is connected to the intake airway. The rest of shop being closed off from the airway, a very strong blast, amply sufficient for all purposes, is obtained.

As has already been stated, one of the chief causes of delay in a mine is through defects in the haulage system. The weakest points of the

ter of this U, what may be called the point of the frog is fastened. The other end of the frog is fastened by means of the pivot a, and is cut in the shape of an arc to readily allow the point of the frog being placed in line with either rail, R S or T U. A piece of flat iron placed under the point forms a surface on which it slides while the lugs b and b', prevent its moving too far either way. The frog, to render it lighter, has been made of hard wood, protected where the wheels come in contact with it by strap iron.

The switch as shown is to allow a car to pass to the east track and thence on the east cage. The continuity of the rail, with the exception of the slight cracks, is not broken. As the cars must be fed alternately to the east and west cages, the switch is next set for the west track. The frog through does not change its position, but the wheels of the car on the rail, R S, will push the block x to one side, which movement will bring the point of the frog in alignment with the rail, R S, thus preserving the continuity of this track. This same movement also throws the block y on the track, which will act in the same way to bring the frog back in alignment with the rail, T U, when the wheels of the car for the east side strike it. As shown in the sketch, the frog has just been passed by a car for the east cage. If occasion requires that a car

should be run in the other direction, opposite to that of the arrows, the frog will act automatically, for the pressure of the flange of the wheel against it will place it in line with the rail the car is to take.

Fig. 5 is a plan of the frog in use at the bottom of the shaft. Here the cars are traveling in the opposite direction to that shown in Fig. 4, coming alternately from the east and west tracks. It is similar to the one shown in Fig. 4, but without the blocks and attachments. Its section can be understood from what has already been said in regard to Fig. 4. The switch, of course, in this case is also automatic.

(To be concluded.)

THE JOHNSON ROTARY PUMP.

The accompanying illustration shows the Johnson rotary pump, for which certain advantages are claimed by the makers, the Davis Johnson Company, of Chicago. It is simple in construction, and the piston heads do not pass entirely through the piston and shaft. The spider does not bear at any point on the outside shell. The pump is positive in action as well as continuous, forcing forward and outward whatever is received into the pump. Should anything get behind the blade or piston-heads which would in any way stop the suction, the next blade follows and the substance is thrown forward with the fluid. As there are no valves the difficulty of clogging is obviated. The pump is easily operated, requiring but a minimum amount of power. All parts are made to template, so that there would be no delay in obtaining repairs, and as the outer head of the pump is easily removed, as shown in accompanying cut, there is no difficulty in examining the pump at any time. Fig. 1 is a general view of the pump; Fig. 2 is a section showing also the piston or spider separately.

This pump is in operation in various parts of the country, handling almost all kinds of material. It is put up not only as a belt pump, as

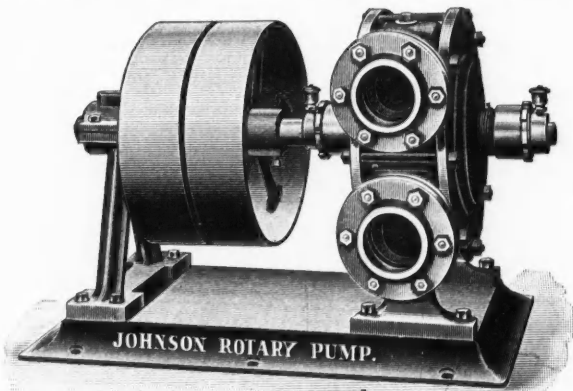


FIG. 1.

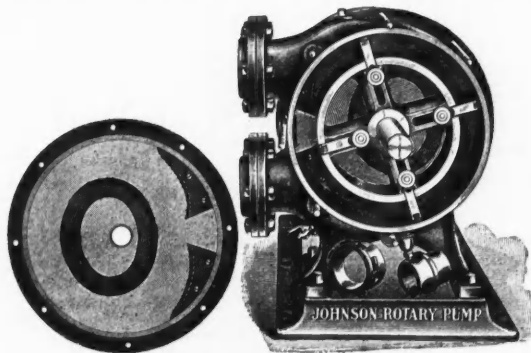


FIG. 2.

JOHNSON ROTARY PUMP.

shown, but also as a steam pump, geared to electric motor, gas or gasoline engine. It is also adapted for pumping into stand-pipe or elevated tank, where large volumes must be handled, which can be done with very little power. For mining purposes, for pumping dip workings, etc., it can be mounted with suction hose and worked by a gasoline engine or electric motor on truck.

A CONVENIENT FORM OF GAS GENERATOR.

By Charles E. Wait.

In the present note I desire to call attention to a gas generator for use in the laboratory for carbonic anhydride hydrogen sulphide or hydrogen. In this generator one of the objectionable features incident to many of the generators in the market is avoided, namely, a movable cork or stopper fitted to the generating vessel, through which passes a delivery tube with a stock-cock. Owing to the loosening of the stopper by repeated use a slow escape of the gas occurs, which in time exhausts the generator.

Fig. 1 represents a generator recently made for me and imported at a cost of \$9. The height over all is 31 in. The generator consists of an outer jar which holds the acid liquid, with tubulature near to bottom for drawing off the exhausted liquid and an inner gas generating tube to hold the solid. In my present generator, this outer jar has a capacity of something over 3 gallons. The tube in which the gas is generated is very much enlarged near the bottom for holding a large amount of the solid, at the top it terminates in a glass stopcock.

This tube by means of an enlargement near the top is securely fastened to the movable cover of the jar, and forms with it one piece. This cover is heavily loaded with lead in order to keep the tube submerged even when empty, and is provided with a hole through which the acid may be poured. With the depth of liquid a sufficient pressure of gas may be secured for most laboratory work. The solid is put into the tube at the bottom, and is held in place by a heavy perforated lead disk which rests on heavy shoulders at the bottom of the tube; this tube when in place reaches to within about two inches of the bottom of the jar.

The salient features of this generator are: its gas tight reservoir, its unusually large generating tube, and the simplicity of its parts which enables the generator to be taken apart, cleaned and recharged with considerable ease.

COPPER RESOURCES OF CALIFORNIA—II. OTHER MINES IN SHASTA COUNTY.

Written for the Engineering and Mining Journal by Herbert Lang.

Whoever will examine a map of California will notice how the Sierras curve around the head of the Sacramento Valley, bending west until they reach and unite with the mountains of the Coast Range, with which they have kept a general parallelism to the southward. Shasta County occupies this immediate region, where the low-lying river lands merge into hills and mountains, and where the Sacramento, after a tumultuous course down the flanks of Mount Shasta and through the canyons of the transverse ridges, eases up in its speed and becomes navigable water not far below Redding, the county seat of Shasta, and 250 miles from the sea. It is a pleasant country, well watered, and forested with pine, fir, oak and other useful and several ornamental woods. The soil is suited in part to agriculture, and the climate is perhaps the most enjoyable in the West, being neither too hot nor too cold, but of a happy mean. It is almost too pleasant to be a good mining country, and had not the history of the last 40 years proved that it is rich in minerals, the experienced

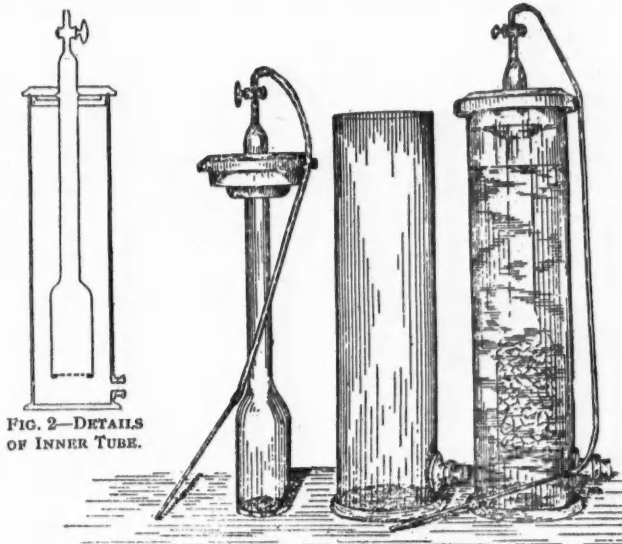


FIG. 2—DETAILS OF INNER TUBE.

GAS GENERATOR FOR THE LABORATORY.

prospector, used to deserts and all the disagreeables of mining existence might well doubt the stories of its underground wealth.

The prevailing surface formations in Shasta County, outside of the farming lands and the auriferous stream deposits, are lava of the basaltic kind, which forms the higher mountains and culminates in elevated volcanic cones in the eastern part of the county, the highest of them being Lassen Peak, over 10,000 ft. high. Old metamorphic rocks, mainly schists, contain the workable quartz veins, for the most part, which have given rise to the placers from which the gold output of the county has been derived. But the copper deposits occur under very different conditions, being found in an acid porphyry rock, which, as I remarked before, forms extensive hills and mountains in the western and northern parts. This copper-bearing formation is much more extensive than at first supposed. It is exposed in many localities on both sides of the Sacramento, and reaching northward for an unknown distance, into the adjacent county of Siskiyou, and possibly as far as the Siskiyou mountain range, which marks the boundary of California and Oregon. Important developments occur on the Pit River, a large affluent of the Sacramento, some 20 miles from its mouth. The Iron Mountain sulphide deposit marks the southern extremity of the largest area, which appears to reach northward for 15 or 20 miles, with a breadth east and west of 3 or 4 miles at the most. Outside of this, the principal area, there are a number of isolated exposures of greater or less extent, such as that at Furnaceville, in the eastern part of the county, where the area is restricted to but a few square miles. In other localities the porphyry seems to partake of the nature of a limited lava flow, covering perhaps but a few acres, or even square yards.

The ore bodies within these areas are simple, both in their mode of occurrence and in their mineralogy. They are marked upon the surface by exposures of dark brown or black limonite, quite impure, and verging into a characterless decomposition product, or variety of products, of the porphyritic country rock. These limonites, when in a state of comparative purity, contain gold and silver to a small extent, while in certain comparatively restricted spots they are rich enough in

those metals to constitute quite valuable ores. Perhaps the average contents in gold and silver of those exposures which have been exploited, may reach \$5 per ton. The limonite (which is generally known by the Cornish name "gossan," in Shasta County) is found to reach a depth of more than 100 ft. at Iron Mountain, but, as a rule, is considerably less in other deposits. It is held, and experience proves it wherever explorations have been carried far, that the gossan deposits indicate the existence of bodies of sulphide ores at a greater depth. This being the case, it is easy to construct or borrow a theory for their derivation from the sulphides by simple oxidation, and the removal of certain constituents which are absent from the gossan. The oxidation process is in fact still proceeding, as is shown by the mineral character of certain springs which break forth from the lodes, the deposition from the mine waters and also from the springs, of basic sulphates or iron, manifestly derived from the ore, etc., etc.

Some quite extensive caves occur in the gossan, evidently the result of chemical forces, aided, I suppose, by the solvent effect of the mineral waters. In the Iron Mountain mine these natural openings reach 100 ft. or more, and are lined with the most singular and beautiful stalactites and stalagmites of the hydrated oxide of iron, frequently of iridescent colors. Some of the pendent icicles reach a length of 3 or 4 ft., with a diameter of not more than 1 in. Others are shorter and smaller, and are knotted and twisted together in a curious manner. I suppose these were formed by the decomposition of the ferrous sulphate derived from the sulphides, into the basic sulphate, which is insoluble, and this, by a further decomposition, into hydrated ferric oxide as at present. The solution of ferrous sulphate percolating through the roof made its way to the extremity of an already formed stalactite, and drying there in contact with the air, added its quota to the solid matter already there, and by a familiar reaction with which the manufacturers of cement copper are acquainted, was changed into the basic salt, and this, by another natural process, into the oxide. I should be glad to learn of analyses of this interesting stalactitic mineral.

It is quite rare that the sulphides come to the surface—in fact I can remember but one instance in which they are found without their "iron hat." It is true that near the Iron Mountain Mine, and at other localities pyrite is found on the surface, but it would seem that in such cases it does not belong to the cupriforous variety which makes up the principal value of these deposits, but is possibly of secondary formation, and carries nothing of value. It is of a white color and may, perhaps, be marcasite rather than pyrite. It is found for the most part outside of the recognized ore bodies and enclosed within areas of decomposed porphyry.

I have previously described the copper-bearing sulphides, and have copied analyses. I need not advert again to this phase of the subject other than to point out local variations in their composition. As far as present developments show, there is no ore body to compare either for size or richness with the huge pyrites lens in the Iron Mountain, but it is not unlikely that explorations may result in the discovery of other important mines. There are hundreds of acres of these iron croppings, hiding, very likely, some important deposits of the valuable metals. Late explorations have shown considerable amounts of sulphides, at Backbone and other places, carrying satisfactory amounts of copper; but for the most part the pyritic material is of too low grade to be worth anything at present. Probably the average contents of the sulphides thus far exposed in the claims to the north of Iron Mountain is not above 3 or 4 per cent., which forbids profitable exploitation under ordinary conditions, but holds out hope for pecuniary success at present prices of copper.

Since the beginning of operations by the Mountain Copper Company, and especially since the late phenomenal rise in copper, speculation has been rife in Shasta County, and the fever has extended itself over the entire State. Claims have been staked by the dozen, and these claims, in most instances without the probability of value, are being held at extortionate and impossible figures, while copper "experts" add fuel to the flame of speculation by rushing wildly about the country and clamoring for bonds. Owners of copper claims are fully possessed with the idea that the recent rise has made their holdings from three to five times as valuable as they were previously, and they have inflated their prices to correspond. But the fact is that the rise has no relation to the value of the majority of the Shasta County properties, because, with a few exceptions, none of them can be brought into production within less than a year's time, and generally a longer period will be necessary to open and equip them. Very few cash sales have been made and few chances are there of any bona fide transactions in this kind of property until reasonable views begin to be held.

One of the best known of the undeveloped properties in Shasta County is the Balaclala group, in Flat Creek District, about 15 miles northwest of Redding, and 4 miles from Iron Mountain. The developments amount to little, but show large quantities of sulphides, the most of them lying underneath the gossan, but in one case overlaid only by porphyry, an uncommon circumstance. The group comprises some 25 claims, none of them patented. A very large amount of the oxidized ore lies upon the surface, the assay value of which appears to be about the same as in the Iron Mountain ore, but the percentage of iron seems rather lower on the whole. Certain exploring tunnels and shafts which were run on this property with the hope of showing up sulphides, are found to pass through the gossan into the country rock below. It would appear from this, what might have been anticipated, that oxidization has continued in some cases quite to the bottom of the ore, leaving no unchanged sulphides. This would naturally be the case when the deposits were originally very shallow or where erosion had taken place to a large extent, removing much of the surface ore and enabling atmospheric influences to penetrate to the bottom of the ore mass. This consideration adds much to the complexity and unsatisfactory nature of the mining problem in this field.

Four assays of Balaclala sulphides gave the following results: No. 1 copper, 4 per cent.; gold, \$3; silver, 2½ oz. No. 2, copper, 1.79 per cent.; gold, \$2.58; silver, 5 oz. No. 3, copper, 3.28 per cent.; gold, \$2.07, and silver, 5½ oz. No. 4, copper, 2.08 per cent.; gold, \$2.26; and silver, 1 oz. The average of these assays reaches, copper, 2.79 per cent.; gold, \$2.48; and

silver, 3.5 oz. If we take these for mine averages (and they are said to be fairly taken samples) the ore of the Balaclala coincides almost exactly with that of Mount Lyell, in Tasmania, where large quantities are being profitably treated by the pyritic smelting process. Large percentage losses are, of course, invariably met with in smelting copper ores of such low grade, so that the copper recovered from 2.75 per cent. ore might not much exceed 2 per cent., or 40 lbs. to the short ton, worth in Shasta County in the form of blister copper, about 3c. per lb. less than the New York price of Lake. With Lake selling at 12c., which is as high as it is safe to figure on an investment, the Balaclala ore contains about \$8 worth of recoverable values, per ton, as compared with the Iron Mountain sulphides, which have about \$12.80 worth. That the Mountain Copper Company thought the Balaclala a hard proposition is evidenced by the fact that it relinquished a bond on it, after a close examination and advice. Ore as poor as this has not hitherto been treated profitably at any point in the West, and it is a question whether it would be safe to attempt it, even at this day of cheap and comprehensive processes. Assuredly it could never be done by the means employed at Keswick, where, as I have previously pointed out, it takes 7 per cent. and over of copper, at ordinary prices, to pay for the treatment of the ore.

One of the best showings in the county is on the Backbone Creek, some 6 miles from Kennet Station. Like the most of the copper deposits, it is workable to a great depth by tunnel, the lode, which is very extensive, being intersected by a gulch some 1,200 or 1,400 ft. deep. The gossan is largely developed, and will doubtless pay for smelting if the work be done on a large scale. The sulphides, as far as they have been opened on, are moderately rich, going some 4 or 5 per cent., as I infer, but later developments show up quite large amounts of much richer ore. Mining might be done here for \$1 per ton, for the ground is favorable, the ore bodies large, timber cheap, and there is abundance of loose material on the surface for filling in the stopes. Water-power, I may add, is to be had also. I have no doubt that under these conditions the mines could be quite profitably worked. They are now undergoing development at the hands of capitalist operators, who are meeting with good success in their efforts.

On the east side of the Sacramento, but in formations similar to those described, there are two mineral localities which have been the scene of active mining operations in past years. At Copper City the ores are chiefly valuable for silver, but carry a notable quantity of gold and copper, in a gangue largely of heavy spar—an uncommon occurrence in the Far West. Native copper also occurs here, more abundantly perhaps than is usual. The deposits, unlike those west of the river, are in true vein form, and seem to persist strongly. Nevertheless, one can hardly expect this locality to contribute very largely to the copper output of the county. The conditions here seem favorable to the establishment of a small local industry of smelting the ores on the spot and shipping a product, preferably of blister or black copper, to distant refineries. Some small shipments of selected ore, sold to the custom smelters, have shown upon assay higher proportions of the precious metals than is usual in strictly copper ores, and it is reported that a considerable quantity of such merchantable material exists in the mines of that vicinity. This being the case, the district is full of promise for future mining.

The last of these copper mines in porphyry to which I shall refer are those of Stillwater, where, on the Black Diamond Group, a German syndicate has some 20 men on development work; and the Furnaceville group, old mines once worked for silver, on the southern bank of Cow Creek, some 20 miles from Redding. Former owners of the last named property built a mill to work the surface ores, and had the usual experience in such cases, finding the ore amenable to ordinary methods until depth was reached, which was not great in this case, and they gave it up on the advent of sulphides in the bottom. Here are three more or less parallel lodes, more elongated and more limited laterally, it would appear, than those of the western part of the county, but lying favorably for exploitation, and carrying ores of a satisfactory tenor in gold, copper and silver. Developments show an extreme width of 25 ft. of ore in the Peck vein, and of 15 ft. in a parallel one. The general appearance is of a moderately extensive series of deposits, with nothing prospectively extraordinary either in size or richness. I have taken samples which assayed 40 oz. of silver from these lodes, but my impression is that 5 oz. is a good fair average, while the copper may reach 6 per cent.

The Donkey Mine, belonging properly to this group, has some peculiar features which are not altogether desirable. Unlike the claims mentioned heretofore, it carries an abundance of zinc, average assays showing some 12 per cent. of that metal. It also carries a small proportion of lead in the form of galena. The ore appears more basic than that of the neighboring claims.

PROTECTING SAFETY LAMPS.—In order to prevent the gauze of a safety lamp from becoming heated by the flame being blown against it in a sharp air-current, the Schniewindt firm, at Neurenrade, Westphalia, has conceived and patented the idea of coating the wires with a non-conducting and incombustible composition, chiefly consisting of asbestos.

REWARDS FOR COAL MINERS.—During last year various silver medals and honorable mentions were bestowed by the French Government on several miners, timberers and overmen for acts of courage and devotion, including A. Lenoir, who, at the Flines-lez-Raches Colliery, rescued a comrade in danger at the bottom of a shaft; L. Vandeputte, who, at the Drocourt Colliery, ran great risk in rescuing a miner overtaken by a fall; F. Boulanger, J. P. Argaud, P. Coure and J. L. Fay, who, in the Villiers pit of the Treuil Colliery, rescued two miners buried by a fall; C. Dubois, who, at the Saint-Berain Colliery, rescued a miner on the point of being suffocated at the bottom of a shaft; A. Navarre, A. Deletombe and J. B. Boulay, who, at the Carvin Colliery, heroically rescued a miner buried by a fall of rock; and A. E. Perrat, for having at the Chapelle-sous-Dun Colliery recovered the bodies of three men who had fallen asphyxiated.

BRIQUETTING MINERAL FINES.

The auxiliary machinery used in preparing fine ores, concentrates, calcines, flue dust, etc., for the briquetting process, forms a study of interest. Burned lime, in the form of milk of lime, has thus far proved to be the most available bonding agent, on account of its low cost, quick setting or hardening quality, and its utility as a flux. In practice, machinery for liquefying the lime and mixing it with the fine ores, flue dust, etc., has proved to be labor-saving and economical. The machines for this purpose made by the Chisholm, Boyd & White Company of Chicago, are herewith illustrated. These auxiliary machines consist of a lime slacking machine A, an automatic feeder B, and a conveyor-mixer C, arranged substantially as shown in the illustration, and preferably on the floor above the mineral press.

The lime machine A consists of a steel trough divided into two compartments by a perforated partition, which acts as a strainer. A shaft extends the entire length with sufficient bearings at either end and appropriate packing boxes to prevent leakage. Upon this shaft, in each compartment, are blades, or mixers, which revolve with the shaft driven from the main gear as shown, the power being applied by belt over the tight and loose pulley on pinion shaft. A lime-pump, 6 in. in diameter, is placed at an opening for the purpose, in the end of the second compartment, below the bearing shown under the letter A. The fresh burned lime and water are delivered into the top of the first compart-

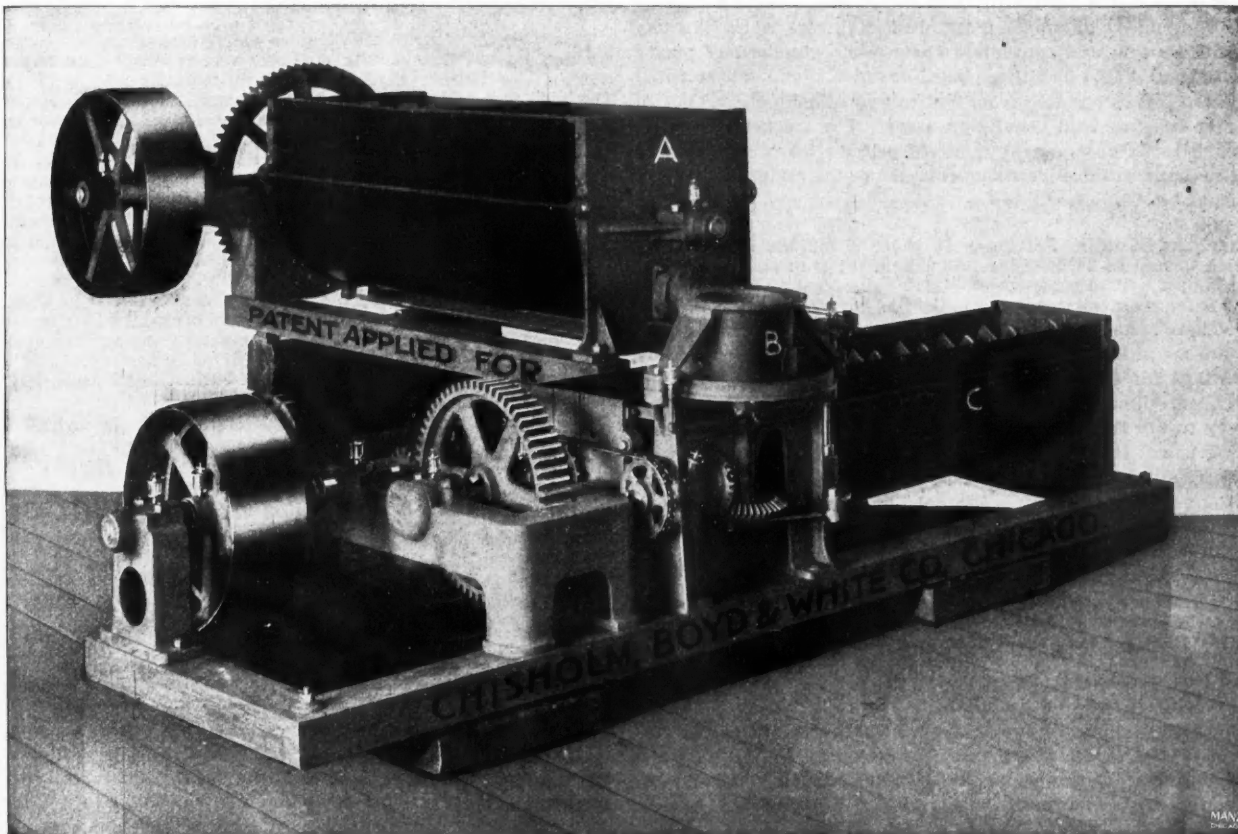
RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

PROOF OF SUBSTANTIAL COMPLIANCE SUFFICIENT.—The proof being sufficient to support the finding that the location of a certain mining claim was substantially in compliance with the laws of the United States, a conflicting, but subsequent, location has no rights to the ground in conflict.—*Argentine Mining Company vs. Benedict* (55 Pacific Reporter, 559); Supreme Court of Utah.

BURDEN OF PROOF IN ACTION FOR INJURIES.—In a suit to recover for the death of a miner, who was killed in an explosion in a coal mine, the burden of proof is on the one bringing suit to establish his contention that the explosion was caused by an air course being partially obstructed by an accumulation of water, so that sufficient air was not passing through it to properly ventilate the mine.—*Deserant vs. Cerrillos Coal Railway Company* (56 Pacific Reporter, 290); Supreme Court of New Mexico.

TENNESSEE MINING LAW.—The law of Tennessee (Acts 1881, Chapter 170), requiring mine owners to employ overseers to examine the workings of mines generating explosive gases, and to see "that they are free from all danger," makes it incumbent on a mine owner to remove coal dust, which is liable to cause an explosion. And a miner who con-



AUXILIARY MACHINERY FOR BRIQUETTING FINE ORES.

ment near the driving end. With the constant motion of the blades or paddles the lime rapidly liquefies and the milk of lime thus formed passes through the holes in the partition into the second compartment in proper condition to be drawn out by the pump. The pump is actuated by a pitman connected to the gear of the feeder B, acting as a crank.

The automatic feeder B consists of an iron hopper, cylindrical in form, open at the bottom, supported on the frame, as shown; it has a movable sleeve or thimble extension. The bottom of the hopper is a revolving disc carried upon an upright shaft, driven by bevel gear. The fine material from the hopper is carried outward on this revolving disc, by centrifugal force, and escapes into the mixer C at the gear end, the quantity being regulated by the distance between the disc and the movable sleeve of the hopper cylinder, which is adjustable.

The conveyor-mixer C consists of a trough, 10 ft. long, made of steel boiler plate, closed at both ends. A square shaft, journaled at each end, extends through this trough and carries heavy blades adjusted to mix and stir the contents of the trough thoroughly, and convey it to the farther end or delivery spout. This machine is driven by a friction clutch pulley 30 in. in diameter, with 8-in. face, while the disc of the feeder takes its motion from a sprocket wheel on the conveyor shaft, as shown.

The design and arrangement of these machines enable them to be driven from the same line-shaft as the mineral press, and when located on the floor above no elevator is required to deliver the mixed product into the press itself. These machines save labor and enable the operator to increase or diminish with accuracy the percentage of bond and moisture to suit the varying conditions of the calcines, concentrates, etc., sent to the press.

tinued to work in a mine after he knew that large quantities of coal dust had accumulated there may recover for an injury caused by an explosion of the dust, whether he neither knew nor ought to have known that it would cause an explosion.—*Knoxville Iron Company vs. Pace* (48 Southwestern Reporter, 232); Court of Appeals of Tennessee.

WHEN PIT-BOSS IS FELLOW SERVANT.—The pit-boss of a mine, working under a superintendent who has charge of the whole property and its workings, is a fellow servant of the other employees, so that the corporation is not liable for the death of an employee caused by an explosion occasioned by workmen going into a room where there is an accumulation of gas, over a danger signal, with a naked light, either by the direction of the pit-boss or with him.—*Deserant vs. Cerrillos Coal Railway Company* (55 Pacific Reporter, 291); Supreme Court of New Mexico.

CONTRIBUTORY NEGLIGENCE OF MINER.—Where on a special occasion an employer agreed to look after the roof of a mine in which his employee was working, and the evidence shows that the employee was busy, with no time to look after such roof, and does not show that his attention was drawn to the fact that the duty of inspection was being neglected, he cannot be said to be guilty of contributory negligence when injured by falling rocks.—*Westville Coal Company vs. Schwartz* (52 Northeastern Reporter, 276); Supreme Court of Illinois.

But where an employee of a mine is injured by falling roof, his own negligence contributing to the injury, he cannot recover from his employer unless the latter was guilty of wilful neglect, or failure to furnish props when requested to do so.—*Sugar Creek Coal Mining Company vs. Peterson* (52 Northeastern Reporter, 475); Supreme Court of Illinois.

QUESTIONS AND ANSWERS.

(Queries addressed to this department should relate to matters within the special province of this periodical, such as mining, metallurgy, chemistry, geology, mineralogy, machinery, supplies, etc. As it is manifestly impossible to devote space to all the questions and notes constantly received, preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot here undertake to give professional advice on problems requiring special investigation and which should be obtained from a consulting expert. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers should send their names and addresses. Anonymous questions will not be answered.—Editor E. & M. J.)

Basic Slags.—To what use are basic slags put in Germany?—F. B.

Answer.—Basic slags are not allowed to run to waste by the German iron and steel makers. The Thomas slag, as it is called, is an important article of commerce for the phosphoric acid which it contains; it is largely bought by the manufacturers of commercial fertilizers. For some purposes—notably for sour marshy lands—it is considered the best fertilizer. A quantity is also used in making cement. More is used in making slag bricks, the manufacture of which was described in the "Engineering and Mining Journal," March 12th, 1898, page 314.

Huebnerite.—Is there any market for huebnerite? How pure should it be? What price will it bring?—R. H. T.

Answer.—The makers of tungsten and dealers in rare metal will buy huebnerite for its tungsten contents. There is no standard of purity except that the ore should be either picked or crushed and concentrated so as to free so far as possible from quartz and other gangue. As to price, tungsten ores are sold usually on assay. The market is not extensive enough to fix any general range of prices. Advertisements of buyers will be found in the advertising columns in the "Engineering and Mining Journal."

Silicon and the Metallic Silicides.—Is there a market for metallic silicon, which is said to be used like aluminum for iron and steel castings? Has copper silicide any commercial value or application? To what extent is ferro silicon used, and is it of any importance?—S. & V.

Answer.—There is a small market for metallic silicon, which is slowly increasing, we are informed. The advantage of silicon as an alloy for iron castings for certain purposes is recognized and sales are increasing. Copper-silicide—or silicon-copper as it is also called—is an alloy made by two or three concerns in the United States, and also finds an increasing sale. It is used for wire and also in certain alloys or bronzes. Ferro-silicon is made by the Willson Aluminium Company (see the "Engineering and Mining Journal," February 18th, 1899, page 204), and some is imported. The trade is not large enough to have statistics yet, and we are not able to give any figures of consumption.

Cerussite.—1. Where can I find a market for cerussite (lead carbonate) either in the form of litharge or red lead?

2. Is it a fact that red lead made from cerussite will make a storage battery which has much higher retaining power than a battery made from the red lead of commerce?—W. A.

Answer.—1. The market for the products you refer to can be found by consulting with dealers; a number of whom have cards in the advertising columns of the "Engineering and Mining Journal."

2. A high authority on storage batteries informs us that there is no advantage as far as he knows, except cheapness, in using cerussite or other lead ores for the manufacture of batteries. All manner of materials have been experimented with by storage-battery manufacturers, undoubtedly including the above mentioned, and they continue to use a specially pure quality of commercial red lead.

Magnesite.—Where are the principal magnesite deposits in this country found?—F. Y.

Answer.—The principal magnesite deposits in this country are found in California. Magnesite has been found in Massachusetts, New York, Maryland and Pennsylvania; but nowhere in sufficient quantity or purity to warrant its working. Discoveries have been reported also from Arizona and Texas, but these have not been developed to any extent. In California the most important are at Cedar Mountain and Livermore, in Alameda County; at Gold Run and Iowa Hill, in Placer County; at Arroyo Seco, in Monterey County; at Child's Valley, in Napa County, and at points in Mariposa, Santa Clara and Toulumne counties. All the magnetise obtained in this country for some years past has been from California. As the product will not stand present rates of freight to the East, that mined on the Pacific coast is used locally.

Electrolytic Copper.—Is there any information as to the quantity of the electrolytic copper used in this country as compared with the total output? Is there information of the same kind with regard to other metals that are electrolytically refined or electrolytically used, as gold, silver, nickel, zinc and lead?—A. K.

Answer.—While there are no exact figures as to copper, it is pretty closely estimated that fully one-half of the copper produced in the United States in 1897 was electrolytically refined; and in 1898 the proportion was slightly over one-half. The demand for electrolytic copper

is the increasing demand, and the tendency is to extend electrolytic works and increase the use of this process every year. In addition to this the capacity of works is increased by improvements introduced from time to time, shortening the time and thus enlarging the output.

As to the other metals it is difficult to give figures. The gold and silver are usually not treated electrolytically except in parting or separating them from bullion containing other metals. For the other metals named exact statistics do not exist, and could only be secured with a great deal of labor.

WATER-POWER IN ITALY.—The use of water-power for industrial purposes continues to make rapid strides in Italy, says London "Engineering;" indeed, so fast has it progressed, that the Government, getting alarmed lest no power should be left for its own use, is granting concessions for private enterprises much more warily than it did twelve months ago. This is partly due to the fact that in view of the success which electric traction companies have had in Italy, the Government contemplates the eventuality of applying electric traction to the State Railways, deriving the power from water supply. Nature has made up to Italy in this respect for the absence of coal, and the Italians are evidently fully awake to the fact that water power is the most economical form of energy so far discovered by man. In ten years up to the end of 1897 over 1,000 concessions for the derivation of water from rivers and canals were granted, from which 123,500 H.-P. were developed and 60,000 acres of land irrigated.

FIREPROOF CONSTRUCTION.—An interesting test of a floor of wooden joists filled in with concrete was recently made by the executive of the British Fire Prevention Committee, says "Engineering." The idea was to record the effect on such a floor of a smouldering fire of 30 minutes' duration, at a temperature not exceeding 800° F., followed by a fierce fire lasting one hour, gradually increasing to a temperature of 2,500° F. This was followed by the sudden application of a stream of cold water for four minutes. The floor tested had a superficial area of 100 sq. ft., and was divided into three equal sections, in each of which a different concrete was used. The floor was not loaded during the test. The test showed that under the conditions named the joists caught fire and that certain portions of the soffit of the concrete filling were disintegrated; particularly on the application of water. The floor stood, however, during the test, though it appeared seriously weakened and deflected at the end. It collapsed five hours later. The floor boards were charred on the under side and at the joints, but did not catch fire. The concrete made with coke breeze proved to resist the fire better than that made with ballast or a mixture of ballast and breeze.

PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

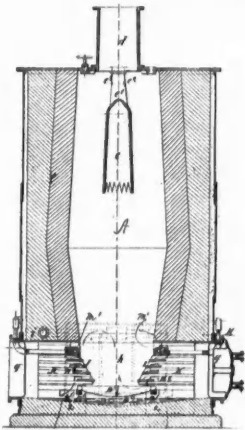
The following is a list of the patents relating to mining and metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

Week Ending April 25th, 1899.

- 623,565. DEVICE FOR LOADING COAL. John V. Schaefer, Chicago, Ill., assignor to the Link Belt Machinery Company, same place. Combination with a movable chute of a detachably-attached extension adapted, when attached to the chute, to be reciprocated thereby, the extension provided at its discharge end with a foldable flap or part so that its length may be varied.
- 623,590. MANUFACTURE OF PIPES. Eugene F. Badgley, San Francisco, Cal. Combination of a water-pan, rollers journaled in the pan and adapted to receive a mandrel upon which is wound flexible material coated with an adhesive compound, standards, and ball-levers fulcrumed on the standards and arranged to swing on opposite sides thereof first to receive the mandrel and carry it to the water-pan and subsequently to press it upon the rollers therein.
- 623,598. APPARATUS FOR FACILITATING EXCAVATING OR MINING. Harry H. Francis, Madison, N. J., assignor of one-half to Curtis G. Culin, Cranford, N. J. Combination of descending and return pipes having horizontal lateral bends, an upright or perpendicularly-presented movable coil forming the extremity or connection between the pipes, an upright movable shield for confining the heat and protecting the operatives, and a movable non-conductive diaphragm or shield for preventing the displacement of the warm air by cold air.
- 623,613. ASPHALT-MELTER. Frederic S. Miller, New York, N. Y. Combination of a kettle, a furnace thereunder, a discharge-pipe connected to the lowest joint of the kettle, and a netting arranged in the lower portion of the kettle.
- 623,654. ART OF PUDDLING IRON. Robert A. Carter, Pittsburg, Pa. As an improvement in the art of puddling iron, the method consists in lining the bottom with iron scrap-cinder and its sides with iron ore, covering the scrap-cinder with iron ore, charging the metal to be treated on the hearth, melting and boiling it to decarburize and remove the sulphur, phosphorus and other impurities, adding spiegeleisen or ferromanganese and finally stirring and balling the charge while held at an approximately uniform temperature.
- 623,686. MACHINE FOR MOLDING HOLLOW CONCRETE BUILDING-BLOCKS. Harmon S. Palmer, Chicago, Ill. Combination with a mold having movable sides, a reciprocating tapering core, and mechanism for operating the movable core and sides to withdraw or release the same from the formed building-block, the mechanism operating to slightly withdraw the core before releasing or withdrawing the sides.
- 623,691. PROCESS OF AND APPARATUS FOR MANUFACTURING ALKALI METALS. Charles E. Acker, East Orange, N. J. The process consists in subjecting the salts to the electrolytic action of an electric current in the presence of a molten metallic cathode with which the liberated metal is adapted to form an alloy, in imparting a forced circulation to the molten metal to conduct the alloy as formed to a separate chamber where it is permitted to stratify, and then volatilizing in an inert atmosphere in the chamber the metal thus liberated from its salt from an exposed surface of the cathode out of contact with the electrolyte, and collecting the volatilized metal.
- 623,692. PROCESS OF AND APPARATUS FOR MANUFACTURING METALLIC ALLOYS. Charles E. Acker, East Orange, N. J. The process consists in reducing the heavy metal in a molten state, and employing it as a cathode electrolytically decomposing a fused salt of the metal of an alkali or of an alkaline earth, while superimposed upon the heavy metal, removing the resulting alloy from the region of the electrolyte, subsequently permitting its different

portions to stratify, and flowing off the lighter portion from the surface.

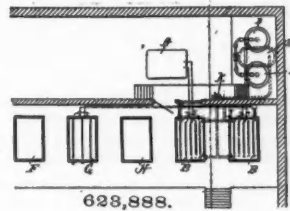
- 623,709. PROCESS OF MAKING CYANIDS. Adolph Frank, Charlottenburg, and Nikodem Caro, Berlin, Germany. The process consists in subjecting the carbide to the action of heat and of nitrogen in the presence of an oxide of a metal only.
- 623,725. CARBURETER. Carl O. Lange, Hamburg, Germany, assignor to Georg Wilhelm Onken, same place. Combination of a receptacle, an automatically-controlled oil-supply pipe, a vertically-adjustable wick-carrying frame, a plurality of air-supply pipes located between the intervening wick-spaces and an exhaust-pipe.
- 623,762. SMELTING-FURNACE. Charles Bishop, Knoxville, Cal. A smelting-furnace, provided with fire-boxes, an ore-supporting arch between the fire-boxes and into which the fire-boxes open, and side flues having their lower ends leading through the arch and provided with perforations in their inner walls.
- 623,773. WATER-PRESSURE REGULATOR. Thomas A. Evans, Portland, Oreg. Comprises in combination a valve chamber, controlling the flow of water into the service-pipe, a neck extending upward from the top of the valve-chamber, a cylinder mounted on the neck, a piston in the cylinder, with which the valve is connected by a stem extending through the neck in the water-tight joint so as to exclude the water from the under side of the piston, a water passageway tapping the service-pipe back of the valve and leading into the cylinder above the piston, means for lifting the piston, and therewith the valve until the back pressure of the water in the service-pipe acts upon the upper surface of such piston, and means for preventing the piston from being violently thrown upward upon being again relieved of such back pressure.
- 623,804. HYDRAULIC DREDGE. Bernard H. Muchle, Detroit, Mich. A dredge-hull provided with an upright spud at or near one end, and a traction-wheel carried by the spud, the traction-wheel constructed and arranged to travel on the river or analogous bottom transversely of the hull, whereby the end of the dredge-hull to which the traction-wheel is engaged may be moved laterally.
- 623,816. ENGINE FOR HAND-DRILLS. Martin H. Olsen, Chicago, Ill. Combination with a rotative shaft, of a pair of sleeves adapted to oscillate upon the shaft as a center, clutch connection between each of the sleeves and the shaft and engaging in the same direction of movement, a piston, adapted to be reciprocated longitudinally upon the shaft, relatively-reversed cam connection between such piston and the oscillating sleeves, whereby the shaft may be continuously rotated by the application of power to cause the reciprocation of the piston.
- 623,822. APPARATUS FOR TREATING ORES OR THE LIKE. Louis Pelatan, Paris, France, assignor to the General Gold Extracting Company, Limited, London, England. Combination with a vat, of a mercury cathode at the bottom thereof, an anode suspended in the vat entirely from above whereby an unobstructed space is provided between the surfaces of the anode and cathode, the anode consisting of an arm extending close to the sides of the vat, and pins or stirrers projecting from the arms upwardly and downwardly to within a short distance of, but none of them touching the cathode.
- 623,833. ROASTING AND SMELTING FURNACE. James A. Russell, Tacoma, Wash. A hearth inclined downwardly in opposite directions from its central portion, gas generating and superheating chambers located on opposite sides of the hearth, and means for cutting off the chambers in alternation from the hearth whereby the heated gases may be directed in alternation over the double-inclined hearth and the inclines of the hearth may be used in alternation for roasting and smelting the ores, by permitting the gases from one chamber to pass first over one incline to smelt the ore thereon and from thence over the other incline to roast the ore thereon and so on in alternation.
- 623,853. APPARATUS FOR BREAKING METAL. Thomas W. Ward and Horatio W. Lash, Sheffield, England. Combination of stationary projections, a hydraulic ram arranged in front of and between these projections, a valved box containing two chambers, one of the chambers having a passage connecting it with the source of pressure, and a second passage leading from the chamber to the hydraulic cylinder in front of the plunger and forming a constant communication between the source of pressure and the cylinder in front of the plunger, the other chamber being in communication with the cylinder of the hydraulic ram behind the plunger, a valve in each of the chambers, a spring for nominally retaining the valves closed, a lever or equivalent means for operating the valves alternately so as to cause the plunger of the ram to be moved alternately in opposite directions.
- 623,854. BLAST-FURNACE-CHARGING APPARATUS. Samuel T. Wellman, John W. Seaver and Charles H. Wellman, Cleveland, Ohio. A furnace-charging device in which are combined a crane, a bucket, a raising and lowering device on the crane for the bucket.
- 623,868. GAS PRODUCER. James A. Bellon Lencauchez, Paris, France. Combination with a combustion-chamber, of a water-reservoir under the chamber, means—such as an adjustable sluice—for con-



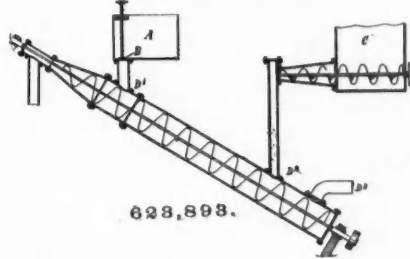
623,868.

trolling the feed of water to the reservoir, and means for feeding air over the surface of the water in the reservoir and upwardly through the combustion-chamber.

- 623,888. ELECTRO-DEPOSITION OF ZINC UPON IRON. Sherard O. Cowper-Coles, London, England. The process consists in placing in an electrolytic cell containing suitable insoluble anode and cathode plates an electrolyte containing zinc sulphate and iron sulphate, and passing through the cell an electric current, the oxygen liberated at the anode when zinc is deposited preventing the formation of hydrogen compounds of zinc or zinc sponge.
- 623,893. PROCESS OF MAKING AMMONIUM NITRATE. Thomas Fairley, Leeds, England. The process consists in subjecting bicarbonate of ammonium to the action of a saturated solution of nitrate of sodium, then separating the liquid from the moistened solid and then



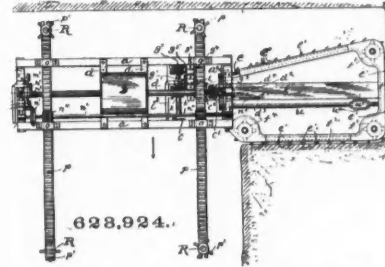
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subjecting the liquid to refrigeration thereby crystallizing out the nitrate of ammonium.

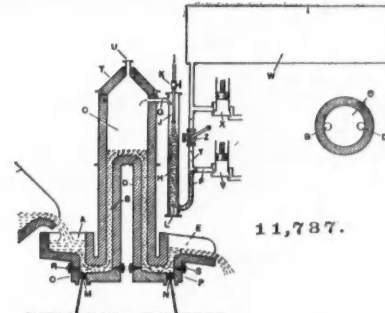
- 623,918. PROCESS OF PURIFYING CAUSTIC ALKALIES. Wilhelm Lang, Griesheim, and Carl Pistor and Max Otto, Bitterfeld, Germany, assignors to Chemische Fabrik Griesheim, Frankfort-on-the-Main, Germany. The process consists in increasing the diffusiveness of a solution of the lyes which is mixed, with other solutions of a similar diffusiveness, by increasing the degree of concentration of the lyes, and then separating the lyes from the mixture by diffusion into water.
- 623,924. MINING MACHINE. James M. McHugh, Boston, Pa. Combination of a suitable frame, cutting mechanism on the frame, means for advancing the cutting mechanism longitudinally into the coal and



623,924.

for moving the frame transversely of the cut, a rocking bar on the frame, a cutter-guide on the bar adapted to form a longitudinal groove in the coal, and means for locking the bar in position.

- REISSUE.—11,737.—MACHINE FOR EXHAUSTING MOLTEN METAL AT HIGH TEMPERATURES. Jacob T. Wainwright, Chicago, Ill. Original No. 538,637, dated January 25, 1898. Reissue No. 11,671, dated



11,737.

June 21, 1898. In combination with an exhauster; a connected vacuum chamber with an elevated bottom, a trap-inlet, and a trap-outlet.

GREAT BRITAIN.

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

- Week Ending April 1st, 1899.
- 6,098 of 1898. STONE DRESSING MACHINE.—A. Cattnach, Kingussie, Scotland. Improvements in machines for boring and dressing stone.
- 10,768 of 1898. STONE PLANERS.—J. G. Faulds, Glasgow, Scotland. Improvements in the devices for holding the cutters of stone planing machines.
- 25,791 of 1898. PUDDLING IRON.—W. Lees, Ashton, Under Lyne. A rotary squeezer for puddled iron in preparation for the forge rolls.
- 1,089 of 1899. COPPER ORE REDUCTION.—Illinois Reduction Company, Chicago, U. S. A. Method of converting copper in ores into sulphate and reducing the copper by electrolysis.
- Week ending April 8th, 1899.
- 9,267 of 1898. REFINING IRON.—W. J. Foster, Stafford. Plant for purifying pig iron by means of oxides of iron and manganese. Keeping the whole in a state of agitation mechanically.
- 10,579 of 1898. MINING MACHINE.—G. W. Winn, Wakefield. In coal cutters of rotating wheel type, means for facilitating the replacing of the cutters.
- 11,001 of 1898. GOLD ORE TREATMENT.—H. L. Sulman. Treating pyritic gold ores with alkaline sulphides, thus making a double sulphide of gold and alkali and then electrolysis.
- 11,555 of 1898. BLAST FURNACE FEEDER.—The Carnegie Steel Company, Pittsburg, Pa., U. S. A. Improvements in the method of feeding blast furnaces.
- 22,879 of 1898. ROCK DRILL.—R. T. Relf and G. Westlake, Plymouth. Improvements in rock drills where many holes are drilled simultaneously.

PERSONAL.

Mr. Thomas L. Darby spent this week in Utah on a mine examination.

Mr. Walter C. Brace is examining properties in the vicinity of Paradox, Colo.

Mr. A. F. Holden, managing director of the United States Mining Company, is in Boston.

Mr. Allan G. Lamson has returned to Salt Lake City from a business trip to New York and Boston.

Mr. E. G. Tuttle is at present engaged in professional work in Utah, more especially examining copper properties.

Mr. Francis T. Freeland recently spent a few days in Utah camps, returning to Colorado from Montreal.

Mr. W. M. Randol has resigned his position as chief clerk of the Tomboy Gold Mines Company at Telluride, Colo.

Captain J. R. De La Mar has been devoting a fortnight to his Utah and Nevada interests. He plans to return to Paris soon.

Mr. Jas. B. Seager of Chicago, has accepted the position of general manager of the Helvetia Copper Company at Tucson, Ariz.

Messrs. Frank Knox, Gus Holmes and H. M. Crowther were in Tuscarora, Nev., the first of the week to examine the Grand Prize Mine.

Mr. Frederick H. Mills, of Boston, is looking into the worth of Utah's notable mining regions, and is prolonging his visit considerably.

Dr. Waldemar Lingren, professor of Geology in Leland Stanford University, was a witness in the Iron Mask-Center Star litigation at Rosslund, B. C.

Judge Henry Rives arrived in Salt Lake a week ago from a visit to several Nevada districts. He predicts a prosperous year for Nevada mining.

Dr. R. W. Raymond, who gave expert testimony in the Iron Mask and Center Star suit at Rosslund, B. C., on the question of extra lateral rights, has returned to New York City.

Mr. C. L. Miller, formerly general superintendent of the Joliet Works, of the Illinois Steel Company, has been appointed by the American Steel and Wire Company its general superintendent of the Pittsburg district.

Mr. Webster Brown of Seattle, Wash., is in San Francisco, on his way to the north from Durango, Mex., where he has been in charge of the construction of a short line railway from San Fernando towards the coast.

Mr. Samuel Newhouse will probably leave New York in a day or two for Salt Lake City. Though no longer identified with the management of the Utah Consolidated, he remains a large stockholder and has other interests in Bingham and other Utah camps, reports to the contrary notwithstanding.

Mr. C. Snelling Robinson has been appointed superintendent of the Bessemer plant, of the Colorado Fuel and Iron Company, at Pueblo, Colo., to succeed Mr. T. W. Robinson. Mr. J. B. McKennan has been appointed assistant superintendent to fill the position made vacant by the promotion of C. S. Robinson. Mr. T. W. Robinson, who has been superintendent of the Bessemer plant since November, 1892, resigned to take a similar position with the Federal Steel Company at its plant, at Joliet, Ill.

SOCIETIES AND TECHNICAL SCHOOLS.

Society of Chemical Industry—New York Section.—The members celebrated the fifth anniversary of the section on May 2d. Out-of-town members and their friends were met in the afternoon by the Reception Committee at the Chemists' Club, where they were informally entertained. The dinner was at the Liederkrantz Club, and was attended by a large number of men prominent in the chemical industry. Among the guests were Dr. Raoul Pictet, of Switzerland; Alfred H. Allen, of England; Dr. Hess, of Germany, and Dr. Kreische, late of Mexico. Mr. T. J. Parker chairman of the section, spoke on "The Day We Celebrate."

Massachusetts Institute of Technology.—At the meeting of the Society of Arts on April 27th Mr. T. B. Kinraide, of Jamaica Plain, Mass., presented an unique form of induction coil of great power invented by him, which has been especially applied to the study of discharges by the aid of photography, the plate being balanced on the point of discharge in a dark room. It reveals in a striking manner the marked difference between positive and negative discharges. The figures produced are of extraordinary beauty, and it is thought they may be suggestive of forms useful to designers and decorators.

Cleveland Engineers' Society.—The semi-monthly meeting was held April 25th, with 22 members and 7 visitors present. The paper of the evening was read by Mr. Lewis C. McLouth, on "Manual Training." The speaker traced the growth of manual training in this country, beginning with the colonial period. He dwelt upon the incompleteness of educational methods which do not teach the student to apply his knowledge, and said: "Then why store the mind with facts that are useless until applied to things, and unless they are applied to things? If they are to be applied to things, why not teach the art of so applying them? An education without this is one-sided, incomplete, unscientific."

The paper was discussed by Messrs. Smith, McLouth, Howe, Langley, Reed, Benjamin, Kendall and Herman. All supported the idea of manual training in the public schools, not only for its physical benefits, but also for its moral training and its tendency to make honest labor with the hands appear more honorable and dignified to youth.

American Chemical Society—New York Section.—At the meeting on May 5th Mr. A. A. Allen was the guest of the section.

Introduced by the chairman, he expressed a keen appreciation of the welcome accorded him. Alluding to his book on "Commercial Organic Analysis," he said that it had occupied all the time which could be spared from his professional work during the last 15 years, and he was pleased to know that the work was so well and favorably known to American chemists.

Papers were read by Dr. J. H. Stebbins "On the Action of Diazo Compounds Upon Thymolpara-sulpho Acids," and the "Richest Figure of Butter," while Mr. L. P. Van Slyke presented some very full records of milk analyses, under the title "Some Facts and Fictions About Milk."

The "Comparative Value of Certain Reagents for Removing Lime and Magnesia from Natural Waters for Industrial Uses" formed the subject of a paper by Mr. M. L. Griffin. Comparative results obtained by treating various waters at ordinary temperature with sodium aluminate, caustic soda, caustic baryta, sodium fluoride and sodium phosphate appeared to show that sodium fluoride established its claims for the removal of calcium salts fairly well, but failed for the precipitation of magnesium salts, and for the removal of iron and aluminum it is very questionable. Aluminate of soda is comparatively slow and does not meet its claims in the case of lime salts. It was more effectual in the removal of magnesium salts. None of the experiments were made at high temperature or under pressure.

Dr. C. F. McKenna exhibited a useful "Valve for Laboratory Apparatus," particularly intended to prevent reflux action in apparatus for distillation.

INDUSTRIAL NOTES.

The American Technical Book Company, publishers of mechanical and technical books, has removed its publication offices from 45 Vesey street to 23 Duane street, New York.

The Chappel Chemical Company, of Chicago, through William H. Chappel, president, and Henry W. Chappel, secretary, recently conveyed to the General Chemical Company real estate in Chicago, valued at \$500,000.

Messrs. Westinghouse, Church, Kerr & Company, New York City, have received a contract from the Detroit Copper Mining Company of Clifton, Ariz., for two Westinghouse gas engines for belting to two 75 k.w. generators.

H. K. Porter & Company, of Pittsburg, Pa., are just completing an order of 8 heavy steel works locomotives for the Carnegie Steel Company, and have recently shipped 9 contractors' locomotives to the Drake & Stratton Company for stripping iron ore on the Mesabi Range, Minn.

The Lewis Company recently opened what will be known as its executive offices at 253 Broadway, New York City. This concern is a general buyer of silver, gold, lead and copper ores and silver and gold bullion, and maintains some dozen branch offices throughout the republic of Mexico.

In the case of the Castner-Kellner Company versus the Commercial Development Company, tried in the Court of Appeal recently at Liverpool, judgment was given in favor of the Commercial Development Company, thus reversing the decision of the court below. The case will probably go to the House of Lords for final decision.

The M. C. Bullock, Manufacturing Company, of Chicago, recently closed a contract for a 70-ton ice machine for Australia, and a 60-ton machine for New Zealand. It is about to erect a large hoisting plant in the Lake Superior district, and is shipping a mining ventilator to Japan and one to the coal mines at Crows' Nest Pass, B. C.

Henshaw, Bulkley & Company, of San Francisco, Cal., are to supply the city of Honolulu with a new water pumping plant, to cost \$40,000. This plant will include boilers, triple expansion vertical pumping engines with a guarantee of 135,000,000 ft. lbs. duty, and a capacity of 5,000,000 gals. daily. The company is also preparing to ship a complete mining equipment to Vladivostok, Siberia.

The Pelton Water Wheel Company of San Francisco, Cal., will supply machinery for the motive power in an extensive electric lighting plant at Cape Town, South Africa. The company has during the past 3 months shipped at least 15 Pelton wheels to various points in Mexico. The Dutch East Indies are also purchasers, the wheels being used to run machinery for coffee plantations, as well as electric lighting and power plants.

The Jeanesville Iron Works Company, of Jeanesville, Pa., is building a compound mine pump for one of the large zinc mines in the Joplin, Mo., district. It will have a capacity of 1,500 gals. a minute, and will be the largest steam mine pump in that district. The company is also building a 23 by 38 and 14 by 48 compound mine pump for the Lawrence Coal Company, of Pennsylvania.

The Chicago Pneumatic Tool Company has purchased the patents formerly owned by the Consolidated Pneumatic Tool Company, now defunct. These patents include all the Keller and Wolstencroft types of tool construction, and in addition several new applications not yet taken out. These patents originally cost the Consolidated Pneumatic Tool Company about \$40,000, and in purchasing them the Chicago Pneumatic Tool Company acquires control of some of the most valuable pneumatic tool patents in existence.

The Union Steam Pump Company, Battle Creek, Mich., reports its general business very good, and states that it has recently been turning out a small, low-cost sinking pump for small mines or prospecting work. The company recently furnished the Reading Iron Works, Reading, Pa., a large hydraulic pump for use in its tube works. Since January 1st, the company says it has made and sold over 2,000 Marsh pumps, and has business in hand to run its works for 4 months. Work is under way on a large addition to the foundry, and a quantity of new machinery has been added to the machine shop.

Incorporation papers have been filed at Albany, N. Y., for the Gruson Iron Works, to manufacture the Gruson turrets for fortifications, which are made at the great Krupp iron works in Germany. They are made of chilled charcoal iron, and are revolved by internal machinery. The directors of the company are: P. H. Griffin, of Buffalo, N. Y.; Thomas Prosser, of New York; C. W. Barnum, of Lime Rock, Conn.; T. Guilford Smith, of Buffalo, N. Y.; Capt. A. E. Plorkowski, of Madgeburg, Germany; Ernst Thalmann, of New York; David Townsend, of Philadelphia, Pa.; S. Singer, of Paris, France, and Herbert L. Satterlee, of New York. The officers are: P. H. Griffin, president; C. W. Barnum, vice-president; T. Guilford Smith, treasurer; Capt. Plorkowski, New York City, secretary. The works are to be located at some point in New York Harbor, it is said, and Salisbury charcoal iron will be used.

C. L. Berger & Sons, successors to Buff & Berger, instrument makers, of Boston, Mass., celebrated recently the completion of instrument No. 3000, by a banquet, attended by the employees in a body. The firm states that it has enlarged its works, increased its force, and made additions to its machinery. To the "Temple" automatic circle dividing engine, it has lately added the "Wurdemann," which, it states, has no superior in the world for precise work. The "Temple" and the "Wurdemann" each represent an expenditure of over \$10,000. The "Wurdemann" is so constructed that it graduates the circle to five seconds of arc, working automatically.

The Pneumatic Supply and Equipment Company has an office in New York City. The company proposes to deal generally in compressed air equipment and states that it will make a specialty of the installation of complete plants, eliminating the division of responsibility which has heretofore existed in the trade. The company also intends to bring out several specialties in the compressed air line, such as pneumatic oil rivet forges, quick acting hose couplings and has closed agencies for several standard types of compressors. Mr. J. W. Duntley, the president of the Chicago Pneumatic Tool Company, is president of the new company. Mr. E. B. Gallaher, formerly with Messrs. Patterson, Gottfried & Hunter, is vice-president and engineer, and Mr. W. P. Pressinger, formerly manager of the Clayton Air Compressor Works, is secretary and treasurer.

The Harrison Safety Boiler Works, of Philadelphia, reports recent orders for Cochran feed water heaters as follows: Midvale Steel Company, Philadelphia, 3,000 H.-P.; Copley Cement Company, 1,250 H.-P.; Chicago Ship Building Company, 700 H.-P.; Granite City, Ill., Steel

Works, 3,000 H.-P.; Carl Prussing Cement Company, La Salle, Ill., 1,000 H.-P.; Tennessee Copper Company, Ducktown, Tenn., two 150 H.-P.; Spyster Bros, Amsterdam, Holland, 200 H.-P.; Delaware & Hudson Canal Company, Scranton, Pa., 5,000 H.-P. Recent orders for Cochran separators include orders from the Wadsworth Salt Company, two 8-in.; Coplay Cement Company, two 14-in.; Lorain Steel Company, one 6-in. receiver; National Enameling and Stamping Company, one 12-in. and two 6-in.; General Electric Company, Schenectady, N. Y., one 7-in.; Parke & Lacy Company, San Francisco, one 8-in.; American Blower Company, London, England, one 6-in.; Buckeye Engine Company, two 4½-in.; Midvale Steel Company, one 4-in., one 5-in., one 6-in.

The contracts for the bridges on the line of the Shelton Street Railway Company have been let to the Berlin Iron Bridge Company, of East Berlin, Conn. The "Peck's Mill" bridge is a deck construction, having four 130-ft. riveted lattice spans, and 3 plate girder spans, about 40 ft. each. The total length of the bridge is 654 ft. The trestle for the South End Land Company consists of one 130-ft. riveted lattice span, one 30-ft. and one 60-ft. plate girder span, making a total length of 220 ft. Besides these are two plate girder spans, 1 of 60 ft. over Far Mill River, and a highway bridge in the town of Shelton. The Providence Gas Company will make large additions to its plant and has placed contracts with the Berlin Iron Bridge Company for a new meter house, 65 ft. wide and 110 ft. long; a purifier house, 40 ft. wide and 175 ft. long, and 3 stories high; and also for a gas holder building 184 ft. in diameter, all of steel frame work and absolutely fireproof. The Berlin Iron Bridge Company is putting up a new machine room for the Duncan Company, at Mechanicsville, N. Y. The building is 72 ft. wide, 170 ft. long; the roof trusses being arranged with trolley beams and hoists, so that the rolls of paper can be lifted in and out of the machines by power. The Berlin Company is also building the steel framework for a new engine room for the Hendey Machine Company, of Torrington, Conn., 40 ft. wide and 60 ft. long. The side walls are of brick; the roof has steel trusses, with corrugated iron covering, supported on steel purlins. A large ventilator extends along the ridge of the roof. The corrugated iron is lined with the Berlin Iron Bridge Company's patent anti-condensation lining.

TRADE CATALOGUES.

Catalogue 66, published by the Sprague Electric Company, New York City, is entitled "Lundell Fan Motors." The handsome cover of the booklet is the outward sign of an attractive interior; the typography is excellent and the numerous half-tone cuts are well executed. The merits of the Lundell fan motor are set forth at length and mention is made of some of the places where it can be used to advantage.

The Justinian Caire Company, of San Francisco, Cal., publishes a very complete 234-page catalogue of assayers' materials, chemicals, laboratory glassware, mine and mill supplies, battery screens, surveying and optical instruments, &c. The catalogue is especially complete in its lists of laboratory and assayers' supplies, such as balances and scales, glassware, blow pipes, burners, crucibles, furnaces, moulds, &c. To meet the demand for cheap and complete outfits for assayers and prospectors, the firm makes an assayers' outfit for \$90 and a prospectors' outfit for \$10, details of which are given.

The construction and uses of the Harrison conveyor are set forth in a 136-page catalogue of conveying machinery, screens, shafting and gearing, published by the Borden & Selleck Company, of Chicago, Ill. Half-tone cuts show the Harrison conveyor installed at coal yards and docks, in boiler rooms, power houses and gas works. Various styles of carriers and buckets and guides of different patterns are shown and prices given. The company manufactures both flat and revolving screens, which are made in any size desired, as well as the patented disc roller screen recommended for Brazilian block or bituminous coal. The catalogue also gives prices on couplings, collars, pillow blocks, rigid and adjustable hangers, friction, spur, bevel and mitre gears, iron pulleys, sheaves, &c.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" what he needs he will be put in communication with the best manufacturers of the same. We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind and forward them catalogues and discounts of manufacturers in each line. All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

Oil Production in April.—According to the Oil City "Derrick," in April 856 wells were completed, 170 of which were non-productive and the aggregate of the new production was 13,947 bbls. Compared with March there was a decline of 92 wells, 880 bbls. production and 33 dry holes. During March 948 wells were completed in the fields producing Pennsylvania and Trenton rock oils, and the new production was 14,827 bbls., while the dry holes numbered 203. The new operations on April 30th in all the fields consisted of 489 rigs and 795 drilling wells, a total of 1,284, which was a decline of 1 rig and an increase of 5 drilling wells over the report for the preceding month.

CALIFORNIA.

Southern Branch of the California Miners' Association.—On April 22d, in Los Angeles, the Southern California Branch of the California Miners' Association was organized by the following men: A. H. Ricketts, T. L. Ford, C. G. Yale, J. F. Davis and Secretary E. A. Benjamin of the California Miners' Association. The branch society is to pay particular attention to the mining counties south of the Tehachapi. Stephen M. White was elected president and O. Brese of Los Angeles, secretary.

Amador County.

(From Our Special Correspondent.)

Amador Queen No. 1.—On the 1,100 ft. level of this mine, 2 miles south of Jackson, operated by a London company, milling ore has been encountered. Sinking will be resumed and the mill will start up at an early date.

Amador Queen No. 2.—At this mine, south of Jackson, 4 shoots of pay ore have been cut in sinking the shaft between the 400 and 500 ft. levels, below the tunnel level where the shaft commences. The tunnel at this point is 300 ft. below the surface.

Bay State.—At this mine work goes on steadily and the management intends to sink deep enough to determine the extent of the ore body. A new air compressor is being put in to run the drills and pump.

Calaveras County.

(From Our Special Correspondent.)

Paragon.—Some very rich ore has been uncovered at this mine near Railroad Flat. The company will run a tunnel in the hill about 1,000 ft. to tap the ledge at depth. Grading is going on for a large air compressor.

Petticoat.—A pumping station is being excavated at the 450 ft. level of this mine at Railroad Flat. A contract has been let to sink 200 ft. deeper. The recent mill tests have been more than satisfactory.

Satellite.—This old mine at Campo Seco, owned and operated by J. K. Harmon of Chicago, now employs 30 men. A water jacket furnace with a capacity of 40 tons per day is being erected, and other improvements are contemplated. B. G. Randall is Superintendent.

El Dorado County.

(From Our Special Correspondent.)

Cambrian.—Development work still goes on at this mine near Granite Hill. A large amount of ore is blocked out and the 5-stamp mill is kept busy crushing. Power is obtained from the El Dorado Water Company's ditch at Granite Hill.

Gopher Boulder.—Stopping is going on rapidly in the upper and lower tunnels of the Gopher, and from the 200 ft. level of the Boulder. The 20-stamp mill is running day and night. This property is located ½ mile west of Kelsey.

Starlight.—Thirty men are employed at this mine, 2½ miles south of El Dorado. A rich strike was recently reported. The 10-stamp steam mill and hoist are in good condition. Water is obtained from the Diamond Ridge Ditch Company.

Kern County.

(From Our Special Correspondent.)

Buckboard.—At this mine in Randsburg, the shaft is down 135 ft. and drifts have been run both ways. The ledge is said to be 15 ft. wide. There is considerable good milling ore on the dump and the erection of a mill at an early date is contemplated.

Mariposa County.

(From Our Special Correspondent.)

Buckeye.—The shaft at this mine near Coulterville is being sunk on a 2 ft. vein said to average \$80 per ton. The 2-stamp mill is crushing steadily.

Nevada County.

(From Our Special Correspondent.)

Lupine.—At this mine, 11 miles northeast of Nevada City, a new tunnel is being run, and the pay channel will probably be struck by July 1st. At a recent meeting an assessment was levied.

Slide Mining Company.—This company is about to erect a 10-stamp mill on its property on the South Yuba River, about 1½ miles east of Fench Carrall. Power to run the electric plant will be obtained from the Excelsior Ditch.

Shasta County.

(From Our Special Correspondent.)

Capital.—This mine on the hill east of Shasta has been purchased by J. H. Moore of Redding, for \$3,000. Considerable development work has been done on the property. One tunnel is in 300 ft. and the shaft is down 65 ft., while several small tunnels have been run. Superintendent I. Krauss recently uncovered a fine 2 ft. vein.

Mount Shasta.—The shaft at this mine in the Shasta Mining District is down 300 ft. About 20 tons of ore is mined per day. Returns from the smelter on three 75 ton lots show from \$56 to \$70 per ton, while 2 lots of sorted ore returned \$420 and \$450 respectively. The average per ton of ore taken out of the mine since it was opened is said to be over \$40.

Sierra County.

(From Our Special Correspondent.)

Otsego Mining Company.—On the property of this company on the Middle Fork near Dobson's, a mill is being erected. A wire ropeway 1,000 ft. long will connect the mine and mill. The ore is fair grade and was formerly worked by an arrastra.

York.—At this mine in Slug Canyon, the lower tunnel is being driven and sinking continues. Development work is being pushed by William York and sons, with a force of 6 men. The new mill is kept busy crushing fair grade ore.

Toulumne County.

(From Our Special Correspondent.)

Rawhide & App.—These mines at Quartz Mountain are reported bonded to Eastern parties for a large sum. If this is true the litigation now going on in the Superior Court will cease for the time being, until the deal is declared off or the mines sold.

COLORADO.

Chaffee County.

(From Our Special Correspondent.)

Mayflower Group.—The Colonel Worth Tunnel is in 125 ft. At 102 ft. vein No. 3 and at 112 ft. vein No. 4 were cut. This group of claims belongs to the Columbia Gold Mining and Milling Company, of Elmira, N. Y.

Little Joe.—A strike of free gold in this mine, near Turret, has disclosed a number of remarkably rich specimens. The mine is owned in Colorado Springs and is to be developed at once.

Clear Creek County.

(From Our Special Correspondent.)

Black Lion Mining Company.—In drifting into virgin ground at the Black Lion Mine, at Idaho Springs, a new ore body has just been disclosed. The first shipment returned \$70 in silver to the ton.

Griffith.—Hood & Maxwell, the owners of this property, at Georgetown, report finding a telluride in the lower workings which shows 165 oz. gold and 6,000 oz. silver to the ton. It is a small seam and crosses the copper streak.

Lord Byron.—The Nebraska owners of this mine, at Idaho Springs, have just completed sinking the shaft to 400 ft. In the dump is a solid streak of smelting ore 12 in. wide, while the balance of the width of the shaft is in milling ore. Stations are being cut and levels will be driven. Instead of stopping the mineral between the third and fourth levels it would be more like mining to sink several hundred feet and not stop and gouge out the mineral every 100 ft. The lode is too strong to continue work in such fashion. The company is composed of wealthy Omaha people, who can afford to spend some money.

Mendota.—F. A. Maxwell has taken a lease on the low-grade producers of this group at Silver Plume and proposes erecting a mill to separate the iron, zinc and lead. It will have a daily capacity of 60 tons.

Sun and Moon Mining and Milling Company.—The annual meeting is set for May 15th, at which time it is expected that a fund will be raised to sink the shaft 1,000 ft. and also to prospect the ground east of the present workings. The company owns a group of 8 patented claims.

Gilpin County.

(From Our Special Correspondent.)

Mine Outputs for April.—Kansas-Burroughs Consolidated Mining Company shipped 409 cars, or 3,475 tons, of which 3,000 tons was milling ore and 475 tons smelting ore. The Concrete Mine shipped 180 cars, or 1,500 tons of ore, all milling, of a good grade.

Mining Transfers.—J. H. Berry and A. Hooper, of Detroit, Mich., and J. Best, of this county, to the Gaston Mine Company, the Retriever, Gaston Extension, Gaston and Defender lode claims in Russell District for \$50,000. O. T. Sparks, of this county, to Aug. Schoppe, of Denver a two-third interest in a placer claim in Nevada Gulch, 1,500 ft. in length. Caroline Mining Company, to A. H. Glaspell, of Denver, the London, Little Annie, John Bishop and Gold Brick claims in Lake District. R. M. Benight, of this county, to Harry Benight, of Denver, a quarter interest in the Sub-Treasury and Cecil lode claims in Russell and Lake districts. T.

A. Anter, of Apex, to J. W. Carson, of Denver, a one-twelfth interest in the Mahoning group of 6 claims in the Wisconsin District.

Ore Shipments.—For April the shipments of smelting ore, tailings and other crude ores to outside points from this county figured up 368 cars, or 6,808 tons. In comparison with the same month for 1898, the shipments show an increase of 1,350 tons, a gain of 25%, and the heaviest month's shipment ever made from this county.

Gilpin Tramway Company.—At a special meeting in Central City to consider a proposition to issue \$75,000 worth of 20-year bonds, the stockholders decided to mortgage the road for \$75,000 and issue bonds for the same, but of that amount only \$65,000 worth of bonds were to be issued at present. The bonds are to be ready for delivery May 15th. The issuing of bonds means that the floating debt will be liquidated, and a new engine and a number of cars will be added to the rolling stock. Fred Kruse is manager of the company.

Mackey-Burroughs.—The shaft is now down 650 ft., and it is showing up well. This mine is owned by Hal Sayre, of Denver, and is being worked by a pool of Central City parties. The working force is about 30 men, and considerable ore is being shipped. A. Christopher is manager.

St. Louis Justice.—A good block of pay ground has been opened up below the 220-ft. level, and increased shipments will follow. The shaft is being sunk an additional 50 ft. G. B. Fey is working the property under lease and bond. It is owned by St. Louis parties.

Topeka.—A car-load of ore shipped this week to the Globe Smelter at Denver, is expected to give returns of about \$15,000. A large plant is to be installed in the next 30 days, and then the production will be materially increased.

Lake County.

(From Our Special Correspondent.)

Leadville Ore Output.—The past week has increased the output from nearly every section of the camp, especially the gold belt. Much new work is being put under way, while developments held back by the timber shortage is again carried ahead fast. Miserable roads still keep down the output from mines shipping by wagon.

A. Y. & Minnie.—In addition to prospecting and development work, the lessees are shipping 110 tons daily of low grade lead sulphide, which is concentrated by their mill into 40 tons. The lessees are also figuring with an Indiana smelter for shipments of zinc ores. A trial shipment proved successful. Several foreign concerns are testing the zinc ore from this property.

Ballard.—This new gold mine, on Breece Hill, is partly tied up by litigation, the Gilbert interest having obtained the right of tying up one-sixth of the proceeds until the case is disposed of. A large amount of development work is being carried on by the owners.

Coronado.—Pumping will soon be completed under the directions of the Leadville Pumping Association, which is handling 450 gal. per minute from the Coronado. When finished, company operations will resume.

Greenback.—This new deep shaft to tap the rich ore shoot of the Mahala, Marian and others is now down 1,100 ft., and in 20 ft. more should reach the contact. Sinking has been suspended this week, pending the erection of a fine surface plant.

Ibex Mining Company.—Development work has been resumed, while shipments run about 250 to 300 tons per day. Mr. F. G. Bulkley has resigned as manager, and Mr. John F. Campion, one of the principal owners, and the general manager, will assume active management again. Mr. Campion intends to conduct work on a larger scale than ever.

Jason.—The strike in this Poverty Flat property has developed into a body of 2½ ft., averaging 30% lead and 20% silver. The strike will attract attention to the large amount of virgin territory in that vicinity.

Lillian Gold Mining and Milling Company.—The property on the south slope of Printer Boy Hill is worked by 14 sets of lessees. The company's interests are represented by Mr. T. S. Wood. The output for April amounted to 2,200 tons of gold ore. The ore finds throughout most of the workings are pockety.

Small Hopes Mining Company.—Shipments have been slightly curtailed lately by shaft sinking to the lower contacts. This work is progressing on the Marian at 1,250 ft., and the further depth will be about 150 ft., nearly half of which is completed.

Pitkin County.

Argentum-Juniata Mining Company.—According to the quarterly report of C. E. Palmer, general manager, the mine produced during the quarter 63 tons gross of shipping ore, netting \$1,642; 8,947 tons gross of milling ore, which produced concentrates, netting \$55,300. Aggregate net smelter returns, \$55,942. The report shows that there were 757,778 tons of smelting ore and concentrates shipped, the gross value

of which was \$66,446. The treatment charges on this were \$10,402, making the net value of ore shipped \$56,044.

The expenses were divided as follows: Repairing, \$1,721; mining, \$26,753; operating Argentum-Juniata, Mollie Gibson Mill, \$7,899; general expenses, \$4,778, making a total of \$41,142.15, leaving a net profit at the mine of \$14,892.58.

San Miguel County.

Columbia-Menona Mining and Milling Company.—Since early last fall this company's mines and 30-stamp mill, in Savage Basin, have been under lease and bond to Nicholson, Godman & Newman, of Leadville and Lake City. The upper and lower workings have been connected by a 450-ft. upraise by which the ore can be delivered to the mill through the mill tunnel, greatly reducing cost of tramping. Good-sized areas of ore have been blocked out and the prospects of the property paying better than at any time in the past are good. The mill is being overhauled and is expected to start soon. The ore is concentrating material with fair values in gold, silver and lead. The mill has a capacity of from 90 to 110 tons in 24 hours.

Teller County—Cripple Creek. (From Our Special Correspondent.)

Cripple Creek District Electric Railway.—This railroad has been absorbed by a number of Colorado Springs capitalists, and has been reorganized. Among those who are now interested in it are Irving Howbert, Jas. F. Burns, W. S. Stratton, W. S. Jackson, Geo. Bernard, Mr. Lennox and others. It is contemplated building the road to Colorado Springs. Rumors are also around that the road will be used to handle ore.

Independence.—This property is now in the possession of the new English owners. It is understood that Mr. Emerson, who has been in charge under the Stratton management will retain his position.

Independence Town and Mining Company.—The United States marshal has arrested John Tomkins and Gus Hull, who are charged with perjury in their evidence before the land office some time ago in the hearing of the Hull City Placer case. It is understood that those in a position to know do not think that this will in any way affect the title of this company to the placer. The new machinery on the new shaft of the company is being put in.

Kimberly Gold Mining Company.—The Hight & Reardon lease on the Lonaconing claim was sold this week to Will Henry and others, of Pueblo, for \$10,000. Some very rich ore has been shipped, and it is understood that the lease is looking very well. The lease has 21 months still to run. The property is on Beacon Hill.

Last Dollar Gold Mining Company.—It is understood that at the annual meeting in Denver the following directors were elected: A. Eilers, H. R. Wolcott, F. E. Brooks, R. P. Lounsbury, B. Y. Frost, Henry Seligen and Willard P. Ward.

Nugget Mining and Milling Company.—At the annual meeting the following directors were elected: Asa T. Jones, G. W. Logan, M. S. Herring, Sherwood Aldrich and Geo. L. Keener. The report of the president shows that \$35,000 were received by the company from the sale of the Katherine claim to the Elkton Company, \$5,000 being paid down and \$5,000 per month, the last payment being on May 1st. Of this money, \$12,000 were used to pay off a debt contracted by the company in 1893, and the company now has \$23,000 in the treasury. Considerable work has been done on the Elizabeth Cooper Claim, by lessees, but no ore has been shipped. The past few months the principal work done by the lessees has been looking for the Jack Pot vein.

IDAHO.

Shoshone County.

Subduing the Miners' Union.—The members of the Miners' Union concerned in the destruction of the Bunker Hill & Sullivan Mill at Wardner who had announced that the creeks of the Coeur d'Alenes would run with blood before they were arrested, took to the woods in panic on the arrival of a single company of the Twenty-fourth Infantry, a negro regiment. Many of the leaders of the outbreak are reported to have escaped into Montana, but the Federal troops have made thorough work, in one case gathering in the entire male population of Burke, long known as a town particularly kind to the assassins and dynamiters who have sought to rule the Coeur d'Alenes. Governor Steurenberg has acted in full sympathy with those who wish to restore order. Sheriff Young of Coeur d'Alene County, a union man, took no especial pains to protect life and property and has had all power taken from him. The men arrested are reported to number over 700. It is stated that the State authorities will co-operate with the Government in bringing the guilty men to trial. It is said that charges of murder and arson will be brought in the State courts, while the Federal courts will take cognizance of the rioters disobeying an injunction forbidding the Miners' Union in any way to interfere with the Bunker Hill & Sullivan Company, and will also punish those who stole the train at Mullan carrying the United States mail. A proclamation issued by authority of

Governor Steurenberg and General Merriam to the mine owners states that:

"Certain organizations or combinations existing in Shoshone County have shown themselves to be criminal in purpose by procuring property to be destroyed and murder to be committed, by reason whereof it has been twice necessary to declare martial law in Shoshone County. You are, therefore, notified that the employment of men belonging to said or other criminal organizations during the continuance of martial law must cease. In case this declaration is not obeyed, your mines will be closed.

"Therefore, in order to carry into effect the spirit of the foregoing notice and restore the industries of the district as far as possible, it becomes necessary to establish a system by which miners may obtain work. The following is promulgated for the guidance of all mine owners and employees in the affected district: All parties applying for underground work in any of the mines will be required to obtain from Dr. Hugh France a permit authorizing said person so applying to seek for and obtain employment. Mine owners must refuse employment to all applicants for underground work without presentation by parties seeking employment of a duly signed certificate authorizing the same. All parties now under employment by any of the mines above named will be required to procure within 10 days from this date the certificate above referred to as a condition of their remaining in the service of their respective companies."

MICHIGAN.

Copper.

Resolute Mining Company.—This company's lands, comprising 1,100 acres, between the Pawnee and Mendota properties, in Keweenaw county, are held by new owners, who have reorganized the company with the following officers: John F. Carey, Escanaba, president; J. D. Cuddihy, vice-president; John S. Dymock, treasurer, and A. F. Heidcomp, secretary. The directors are: John F. Carey, J. D. Cuddihy, James R. Dee, John S. Dymock and Arnold A. Miller. A shaft was sunk on the property many years ago to a depth of between 250 and 300 ft. An amygdaloid vein from 5 to 10 ft. wide has been located, the value of which will be determined. A pump and hoisting plant will be put in the shaft.

Winona.—The lode is exposed by surface explorations for 2,800 ft.

Iron—Gogebic Range.

Davis.—On this property, east of the Bonnie, near Ironwood, a number of test pits put down by J. R. Moore and others are reported to show a body of ore over 70 ft. thick.

Iron—Marquette Range.

East New York.—This mine, near Ishpeming, will, it is said, be re-opened and worked this year. It closed down in 1892, and was dismantled.

Imperial.—This mine, in section 25, T. 48, R. 31, southwest of Lake Michigamme, and some 5 miles from the town of Michigamme, has been secured by Pickards, Mather & Company, of Cleveland, and by the Cleveland Cliffs Company. The property was worked in the 80's, and produced 115,076 tons of ore, a limonite giving about 58% iron and 0.20% phosphorus, with about 5% silica, that smelts nicely in the furnace. The mine was worked as an open pit, the ore coming close to surface, requiring but little stripping.

Volunteer.—This mine, on the Cascade Range, back of Ishpeming, is reported sold to the Cleveland Cliffs Company. The ore is a hard, siliceous hematite. The mine has been idle 2 years. Secretary of War Alger was the principal owner.

Iron—Menominee Range.

Riverton.—This mine, formerly the Iron River, at Iron River, is owned by the Oliver Mining Company, who, it is said, will divert the river to protect the mine. The ore is a fair non-Bessemer, giving from 60 to 61% iron; 0.170 to 0.400 phosphorus; 2 to 5% silica; 1.20% lime; 2 to 5% water, and is said to smelt easily. The mine is being bailed out.

Pewabic.—The concentrating plant at this mine, near Iron Mountain, has started work for the season.

Sheridan.—This mine, at Iron River, is nearly pumped out.

MINNESOTA.

Iron—Mesabi Range.

(From Our Special Correspondent.)

Adams Iron Company.—At this mine the Misabe Road is building a track to reach No. 2 shaft and stock pile and at No. 3 a very large engine house is going up, which when completed will be one of the finest on the range. There are some 220,000 tons of ore in stock.

Biwabik Bessemer Company.—Two shovels are loading ore and a third soon starts. About 5,000 tons a day are shipped from this mine at Biwabik. This mine consists of two immense open pits, some distance from each other, and the original plan was to connect them by a deep cut. The

cost and the time required has prevented the completion of this work, though much has from time to time been done. Now this connection is under way, a cutting some 400 ft. long and averaging not far from 60 ft. deep. The two pits cover about 350,000 sq. ft. each, and down to depths varying from 100 to 125 ft. The stripping on each averaged about 45 ft. Raising trains of loaded cars from the present depth has made operations slower and more costly than at other open pit properties on the Mesabi. The completion of the cut will enable trains to run through.

Biwabik Mining Company.—This company has 100 men in the ore and 150 in the stripping and has begun active shipments. A new Barnhart "K" shovel has been ordered. When the mine was opened in 1892 it was the plan to connect the two cuts, at the east and west sides of the ore body, but the tremendous cost stopped the work and delayed its completion. This year it will be finished and trains run through, greatly reducing the cost of loading and handling cars. The amount of earth moved by this cutting will be not far from 1,000,000 yds.

Cole & McDonald have drills at the Sparta and on Section 25, T. 58, R. 17, the latter for Adams and Rouchelleau, of Duluth. They have 2 drills on the Vermilion Range, at Ely; 2 at Iron Belt, Gogebic Range; 2 at Iron River, Menominee Range, and 1 at Cripple Creek, Colo.

Drake & Stratton Company.—This company has raised the wages of its 1,200 laborers at Eveleth, Biwabik and other points on the Mesabi from \$1.50 to \$1.75 a day, and there still is trouble in getting some classes of men wanted. Some of the mines claim to get all the employees wanted at the rate of \$1.65 for common labor.

Shipments of ore are already very heavy. The depth of water in Lake Superior is fair, but not what is hoped for later in the year.

Fayal Iron Company.—This mine has begun shipping from its stock pile of about 300,000 tons. It is also hoisting from 3 shafts. Heavy pumps have been lowered at No. 2 shaft to take care of what water may come in from the stripping close by.

Franklin Iron Mining Company.—This company has been sued by Jas. Davison of Bay City, Mich., for \$6,304, for alleged breach of contract in 1896, when it contracted to furnish him 100,000 tons of ore for shipment at \$1 a ton, but that it failed to deliver more than 87,392 tons.

Jones Exploration.—At the Jones property, close to the Franklin, where considerable good ore was shown up in 1893, John T. Jones & Company are working again, with Bert Jones in charge. Surface buildings are now under way. One of the old testpits cut through 200 ft. of ore.

Kanawha Mining Company.—This mine will be opened by Sellwood, Roberts & Company, with Richard Sellwood in charge. It was one of the early discoveries of the range, but has never been mined. It lies close to the Hale and will be operated in connection therewith.

Lake Superior Group.—These mines of the Consolidated Company at Hibbing are hoisting and shipping about 4,000 tons a day, and are working short handed. No stock shipments have been made.

Mahoning Ore Company.—The shipments are not so large as had been hoped for, and as they will be soon, as the Eastern Minnesota road is not furnishing cars enough and the road bed near Cloquet is in bad shape. An immense amount of money will have to be spent on this line before it equals the Duluth & Iron Range or Duluth, Missabe & Northern.

Oliver Iron Mining Company.—This company has secured a 99 years' lease of the Stevens ore deposits in T. 58, R. 15, about 8 miles east of Biwabik. The ore body is generally understood to be rather low grade, but of immense size, some estimates going as high as 30,000,000 tons. The Oliver Company pays 15c. a ton royalty on all ore it takes out.

Penobscot Mining Company.—Nearly 600 tons are being mined and shipped daily to the Alouez Bay docks. The mine is probably good for 100,000 tons during the year, and perhaps more. It will be worked steadily.

Iron—Vermilion Range.

(From Our Special Correspondent.)

Lands in Section 11, T. 61, R. 15, owned by J. D. Murphy, are said to have shown up much ore of good quality. Close to this property are lands on which J. M. Undewood is exploring. It is hoped to have a working shaft in operation by July, and to do some stock piling this year. The ore is an excellent red hematite and lies very close to the surface. Considerable diamond drill work is under way.

Minnesota Iron Company.—At this company's hard ore mines at Soudan 750 men are working, and everything is moving along rapidly.

MISSOURI.

Jasper County.

Boston-Aurora Zinc Company.—Colley & Company are to secure the fee of 538 acres of land near Aurora, with all the machinery and equipment on it, which this company will own. Of

the total acreage 80 acres are developed and 450 are undeveloped. The exploration work done is said to show ore enough in sight to last 3 years at the present rate of extraction. The ore body is of unusual size and very rich. There are 3 mills on the land, and the purchase includes sub-leases as well as fee. The output for 6 months ending March 31st, is said to have yielded a profit of \$151,866. The new company has a capitalization of \$3,200,000; par value of shares, \$25, with \$800,000 of 8% cumulative preferred stock and \$2,400,000 common stock. The officers and directors of the company are: President C. Minot Weld; vice-president, Leslie C. Wead; treasurer, Arthur B. Silsbee; secretary, William E. Colley; directors: Chas. S. Hamlin, Boston, Mass.; Arthur B. Silsbee, Boston; Chas. H. Sprague, Providence, R. I.; Leslie C. Wead, Boston; Chas. A. Campbell, Boston; W. E. Colley, Providence; George U. Crocker, Boston; Simon Davis, Boston; C. Minot Weld, Boston.

MONTANA.

Deer Lodge County.

(From Our Special Correspondent.)

Emory.—A bad fall of ground caught and killed 2 miners recently.

Gladstone.—A strike of 20 in. of shipping gold ore is reported in this property by Messrs. Sullivan & Burrier, the owners. The mine is situated near the old placer camp of Pioneer. The ore is sylvanite.

Granite County.

(From Our Special Correspondent.)

Basin Gulch.—Paul A. Fusz, of the Granite-Bimetallic Company has bought the last of the placer holdings of Watson & Spees. The gulch was located by them in '93, and the work done shows the gold-bearing character of the gravel. Mr. Fusz plans for opening up the diggings by hydraulic work, as he and the Eureka Placer Mining Company own practically the entire Gulch.

Sunrise Mining and Milling Company.—A writ has been issued by the District Court demanding the directors of this company to call a meeting forthwith for the purpose of electing a board of trustees. The writ was issued upon the affidavit and petition of Wm. Thompson, of Butte, and against F. M. Durfee, F. D. Brown, E. L. Holland, A. A. McDonald and J. H. Harper as defendants. The trouble is over a recent sale of stock to Thompson.

Union Mining and Developing Company.—This property, on Rock Creek, has started its 10-stamp mill. It claims to have sufficient ore on the dump for a 6 months' run.

Jefferson County.

New Elkhorn Mining Company, Limited.—The report of Superintendent W. S. Kelley for the quarter ending March 31st, states that the total amount of ore panned in that quarter was 2,900 tons, with a per cent. saved of 88.03. The amount of bullion produced was 104,934 ozs. silver and 36 ozs. gold, while 305 tons of smelting ore were shipped. The total receipts were \$82,108, and the expenses \$1,193, leaving a profit of \$1,193.

(From Our Special Correspondent.)

Alhambra.—This Strawberry Mountain property has been bonded for 12 months for \$5,000 by Butte parties.

Belle.—Moreland & Company have thrown up the bond, not being able to find a paying ore streak.

Ben Bolt.—A year's bond for \$20,000 is to be taken by Helena parties.

Daphne.—Heinze, of Butte, has taken a 12 months' option on this mine and will sink a deep shaft looking for copper. The lead shows 20 in. of 7% copper ore, with 15 oz. silver and some gold.

Eva May.—This mine and mill are closed down, awaiting orders from the Eastern stockholders to sink the shaft 200 ft. deeper.

Guess.—C. W. Flemming has made what looks like one of the best surface strikes ever made in the Warm Springs District—16 in. of 60% galena. In sinking 8 ft. 5 tons of ore was taken out. The lead is 10 ft. wide of concentrating ore and is a continuation of the B. & G. lode on the west. The ore carries gold, silver and lead.

Lincoln.—James Russel, who is working this Lump Gulch property, reports a body of gray copper ore with some black sulphides at the bottom of the new shaft.

Relief.—Shipments have been resumed which average 40% lead with 1½ oz. silver with each per cent. in lead.

Rogers.—This claim, on the South Fork of Warm Spring Creek, that has been under quiet development for 2 years, shows 21 ft. of concentrating ore which will average \$14 and will concentrate by tests made 6 into 1. A mill is to be built at once.

Rose.—The tunnel is now in 250 ft. and going forward at the rate of 60 ft. a month.

Lewis and Clark County.

(From Our Special Correspondent.)

Dry Gulch.—H. Bush has applied to the Helena Council for a franchise for an electric road

through the city to enable him to transport his ores to the Missouri River, near the dam where he proposes to build concentrating works.

Hamilton Gold Mining Company.—This company, which last year built a 10-stamp mill on the Yellow Jacket, has temporarily closed down.

Howard.—Cockran & Company are making regular shipments of gold ore from this property.

Winscott.—The 10-stamp mill will start up by May 15th.

Ravalli County.

(From Our Special Correspondent.)

Curlew.—This property of the Helena & Victor Mining Company, is being worked by the receivers, who intend starting the concentrator May 15th.

Pleasant View.—A 250-ft. shaft on this property 10 years ago disclosed a fair body of copper ore, but as the owner died and the process of settling the estate was a slow one, nothing further was done. In the present scramble for copper Eastern people have bonded the mine and will work it.

Whip-Poor-Will.—This property, about 1 mile from Victor, is under bond and lease to Johnson and McHaffey for \$20,000—another supposed copper proposition.

NEVADA.

Lincoln County.

Pioche Consolidated Mining Company.—The 25-stamp mill of this company at Pioche, one of the first plants erected at Pioche, was burnt recently. The mill was equipped with Frue vanners, and was owned chiefly by J. B. Claffin, of New York. The loss is estimated at \$20,000.

Storey County—Comstock Lode.

Justice Mining Company.—At the recent annual meeting in San Francisco the old management was re-elected for 1899, with A. Waterman, H. Zadig, R. E. Kelly, William Bannan and E. P. Barrett as directors; A. Waterman, president; R. E. Kelly, secretary; Clayton Belknap, superintendent. According to the report of the superintendent, during the year 279 tons of ore were taken out of the Barclay shaft, of which 180 tons were milled at the Douglas and Taylor mills, yielding bullion as follows: Gold, \$5,429; silver, \$2,348; total, \$7,777. About 1,100 tons of second-class ore, the car sample of which showed its assay value to be \$5.63 in gold and \$5.78 in silver, per ton, are on the dump, and it is believed can be profitably milled at the company's mill, which is about ready to begin working.

White Pine County.

Robust.—At this mine, at Ely, a rich streak of ore is reported opened in the bottom level, from which shipments are made to Salt Lake. The milling ore is reported to give a good extraction by the cyanide process. A Folsom crusher and disintegrator is being tried for pulverizing the ore.

PENNSYLVANIA.

Bituminous Coal.

Continental Coke Company.—This company, incorporated to conduct the coking operations of the National Steel Company, has bought the Thompson tract, 717 acres of coal lands, owned by J. V. Thompson, president of the First National Bank of Uniontown. The price was \$1,100 an acre, or \$788,700. The property lies west of Uniontown. Included in the purchase is the transfer of 50 acres of surface property through which the Coal Lick extension of the Southwest branch of the Pennsylvania Railroad extends. On this about 600 beehive coke ovens will be constructed at once by the company. The vein of coal is one of the finest of the region and is 9 ft. thick.

Pittsburg Standard Coal Company.—This company, composed of Pittsburg and Baltimore parties, has, it is reported, purchased 4,000 acres of undeveloped coal acreage in the thick-seam region, along the Youghiogheny River, between Smithton and Sewickley Creek. The price approximated \$1,000,000.

(From Our Special Correspondent.)

Cambria Iron Company.—A fire has broken through into the Mahoning Mine from the Hill Farm Mine, where occurred the great disaster in 1892. The fire in Hill Farm has never been extinguished since that time.

Labor in Connellsville Region.—An advance of from 6 to 12½% has been granted to the coke workers throughout the region, and affects fully 18,000 men. The number of workmen is far short of the demand, and last week 165 negroes were brought from Norfolk to work at the W. J. Rainey plants.

New Coke Company.—Isaac Taylor, who is interested in the Crossland plant, owned by the Atlas Coke Company, south of Uniontown, is about ready to let the contract for the erection of 80 new coke ovens of the bee-hive type between Smithfield and Gans, where he has purchased 120 acres of good coal lands. The new plant will be between the coke plants of the Uniontown Coke Company and that of the Con-

nellsville Coke Company. The latter firm is just completing 30 new ovens of the bee-hive pattern.

Slate.

(From Our Special Correspondent.)

Bangor Union Slate Company.—One of the 7 directors re-elected at this company's annual election this week is venerable John I. Blair of Blairstown, N. J. The officers chosen were: President, Conrad Miller, Nazareth; vice-president, C. N. Miller, Bangor; secretary, W. H. Vail, Blairstown, N. J.; treasurer, A. M. Paff, Bangor. This season's output is estimated at 2,500 to 4,000 squares monthly, one-third increase over previous productions. A large rubbish dump is to be removed to open up new beds.

Bangor Valley.—W. H. Bowers, lessee, who is clearing off a new slope to reach a new top bed, must remove 5,000 cu. yds. of top.

Bowers & Mutton.—A slide at this quarry last week carried half the landing and 1 derrick into the pit. Only 1 rope is working.

Columbia-Bangor.—8,000 yards of top is being moved to clear another 20 by 60 ft. ledge.

Danielsville.—This quarry has been taken on lease by George Stoddard, lately of the New York Quarry. Two ropes are clearing out a large accumulation of rubbish. Mill stock will be largely made.

North Albion.—This 18-acre tract with partly opened quarry has been sold again at trustees' sale to an Easton, Pa., operator.

Old Bangor.—The announcement is made that this quarry will resume work May 15th, under lease of J. S. Moyer & Company, of Bethlehem. It is the largest quarry in the Bangor region or in the United States, but has been idle since September 5th, 1898, owing to a strike of the laborers.

Old Delabole.—Excavations are completed and slate-making has begun. A pit 60 by 130 ft. has been uncovered and a 80 h. p. boiler and hoist works 1 derrick. A monthly production of 1,000 squares is expected.

Center County.

Bellefonte Furnace Company.—This company of New York and Philadelphia men, has purchased the iron mines of Carnegie & Company, at Scotia, as well as the ore right on hundreds of acres of lands. J. W. Gephart, general superintendent of the Central Railroad, of Pennsylvania, negotiated the purchase and will be the president and general manager of the new concern.

The Carnegie ore mines have been idle for 6 months. In addition, the company will build 1 mile of railroad, with a 600-ft. iron bridge, to connect the Collins furnaces with the Central Railroad of Pennsylvania. The resumption of work will give employment to from 500 to 800 men. The Collins furnace is of 150 tons daily capacity, but has been idle since 1890.

SOUTH DAKOTA.

Lawrence County.

(From Our Special Correspondent.)

British American Company.—A boarding house, shaft building and other improvements have been erected. J. M. Sweeney of Detroit, general manager, is expected in Deadwood the middle of May to begin sinking.

Chicago & Two Bit.—After drifting 160 ft. at the bottom of a 500 ft. shaft, a shoot of ore has been encountered. The ore shoot has not been crossed yet. It runs north and south on quartzite. Two Bit Camp has been dead since last summer.

Detroit & Deadwood.—This company is running 2 drifts from the shaft bottom on the mining ground on the East Fork of Two Bit. Company has ordered an air compressor and machine drills.

Deadwood & Delaware.—The company has encountered gouge matter in the Delaware shaft, in Ruby Basin, at 460 ft. A diamond drill hole on the ground encountered quartzite at 500 ft. The company is to sink to quartzite and run 1,000 ft. of drifts to carry out an agreement with other owners in the ground. There are 17 claims in the group.

Fairview Smelting & Refining Company.—This company of Chicago, which has been incorporated to erect a large smelter on Redwater, has issued circulars to the mine owners of Lawrence County asking for guarantees of ore. The company pledges to treat all ore at not exceeding \$7 per ton, which is less than the present price in the Deadwood.

Faust & May.—E. May, who leased this mine last winter, has resumed work.

Galena Mining & Smelting Company.—Two forces of men have been set to work on this company's ground, in Ruby and Boomer Gulches. Since the resignation of George B. Luper of Philadelphia, as superintendent, the property has been in charge of Mr. Dixon, the head assayer.

Homestake Company.—After 3 months of repair work, the new Golden Star hoist at Lead, one of the 6 hoisting plants of the company, has begun work. The main shaft has been re-tim-

bered to the 500 ft. level and is being sunk an additional 100 ft., making it 900 ft. deep.

Norwich.—The lessees of this mine in Strawberry Gulch have leased the old Union Hill stamp mill and have begun hauling ore.

Pocahontas.—A 2 ft. vein of silvanite ore has been encountered in this claim in Carbonate Camp owned by J. B. LeBeau, of Central City, and associates.

Spearfish Mill.—This cyanide plant, owned by the Spearfish Cyanide Company, is being enlarged to 50 tons capacity. It is now running on Ragged Top ore.

Sunset.—Trouble with the pumps in the Sunset drift, south of Terry, has caused a temporary shutdown of work. The unusual amount of snow in this district has filled a good many of the mines with water this spring.

Pennington County.

(From Our Special Correspondent.)

Holy Terror.—A cyanide man is at the mine experimenting on the ore of the Keystone Mine and the concentrates from both mines. The ore in the Keystone is not as free milling as the Holy Terror. The shaft of the Holy Terror is to be sunk 200 ft. deeper.

St. Elmo.—The 10-stamp mill is running. Shaft is down 160 ft., where the vein is from 4 to 14 ft. wide.

Uncle Sam.—The water is nearly cleared from this mine, on Elk Creek. The main shaft is to be sunk 100 ft. deeper and a drift run 210 ft. to intersect the incline workings. The hoist is being repaired.

VERMONT.

Orange County.

Eureka and Union.—These copper mines at Corinth are reported sold to Dr. L. A. Smith, of New York, and H. T. Cushman, of Bennington, Vt. The Eureka was owned by Gov. Roswell Farnham and the Union by J. E. Waterman and C. H. Hutchinson, of Manchester, N. H. It is understood that the new owners represent capital, and will employ a large force at the mines.

UTAH.

(From Our Special Correspondent.)

May started in with a snowfall throughout the mining camps, followed by freezing weather. Tintic and Fish Springs are the only reliable producing camps where winter has really gone. At Park City shipments are at the lowest ebb—due to impassable roads.

Bullion and Ore Shipments.—In April there were forwarded East from the different smelters and camps of the State, 97 cars, or 4,058,097 lbs., lead-silver bullion; 9 cars, or 378,566 lbs., copper bullion; 72 cars, or 3,068,900 lbs., lead-silver ore. For the week ending May 6th, the shipments east were 14 cars, or 612,163 lbs., lead-silver bullion; 2 cars, or 84,239 lbs., copper bullion; 10 cars, or 391,960 lbs., lead-silver ore.

Cyaniding Products.—Compared with the first four months of 1898, the gold yield from cyaniding plants, which market their products at Salt Lake City, shows no particular increase. May should, with 4 mills at Mercur operating, none of which were in commission in May, 1898, and by June there will be contributions from other localities, particularly from mills which are worked during the summer and fall.

Inland Crystal Salt Company.—At Salt Lake City, on May 6th, the first annual meeting of the reorganized company was held. The Inland Crystal either owns or controls every Utah salt factory. President William B. Clarke, of Kansas City, says, there is no trust, but a combining of plants to reduce expenses and place the industry on a paying basis. Refined salt is not increased in price, and will not be. Utah salt is shipped east as far as Kearney, Neb., and west to the Pacific coast. Mr. Clarke says that the volume of 1899 business will probably exceed any recent year. The old directorate was re-elected, and N. W. Clayton, of Salt Lake City, is vice-president and general manager.

Local Smelter Situation.—Under the new smelter regime, the Germania is the sole plant in operation. It is doubtful if the Germania will be able to handle all the products that it is deemed desirable to treat here. The local ore supply is now largely curtailed by the temporary cessation of production of the three Bingham mines, recently purchased by the United States Mining Company. The Germania has 5 stacks in commission—3 large and 2 small—the joint capacity being about 500 tons per diem. It is said that the Pennsylvania will have its large stack again in blast within two months, and it will probably stay in commission for the year. While the Hanauer, rebuilt last summer, is to have a long vacation.

Garfield County.

(From Our Special Correspondent.)

Hoskaninni.—Gold-bearing tracts along the cañon of the Colorado River, from Dandy Crossing up stream, are to be further tested this year. That this river gravel carries gold in remunerative quantity has been demonstrated by prospecting, especially by the work done un-

der the manager, Robert B. Stanton, who is now in Boston arranging for a dredging outfit, to be put in when the high water is over in June. Possibly 3 boats may be put in, and the motive power will be supplied from a central electric plant. Dandy Crossing is 110 miles by wagon road from Green River, on the Rio Grande Western Railroad. This company—of peculiar name—the chief office in Columbe, O., will be the first placer project of the kind in Utah.

Juab County.

(From Our Special Correspondent.)

Tintic Shipments.—During the week ending May 6th there were sent forward from 3 railroad points of the district 4 bars of dore bullion, 83 cars of ore and 1 car of concentrates. Ore shipments were contributed by the following mines: Bullion Beck, 20 cars; Grand Central, 19; South Swansea, 8; Gemini, 7; Mammoth, 8; Centennial Eureka, 6; Uncle Sam and Humbug, 5; Godiva, 5; Sioux, 2; Joe Bowers, 1; Four Aces, 1; Star Consolidated, 1, and Dragon Iron 1 car hematite for flux. The Mammoth sent out 4 bars and a car of concentrates.

Tintic Iron.—The deep exploration of the 50-acre tract, commonly called the Dragon, is to be carried on under the name of Tintic Iron, a private undertaking of Messrs. Newhouse, Weir, et al, and no company is to be formed till the worth of the ground is proven, if then. A shaft is to be sunk through this huge cap of iron for 500 ft. before a drift is driven. The bond calls for \$300,000.

Bullion Beck.—Underground conditions are reported for maintaining present production throughout the season. The mill is working satisfactorily.

Sea Swan.—The steam hoist is installed, and George W. Paxman states that he is about to let a contract to sink the shaft from 200 level.

Salt Lake County.

(From Our Special Correspondent.)

Utah Consolidated Smelter.—Whether this smelter, the Highland Boy, will do custom work cannot be stated; probably not for some time. The dynamos and all machinery work admirably; the furnaces are dried out and tested, the sampler is receiving and handling ore, and about May 15th the first copper will be run. The capacity is 250 tons of ore per diem.

Summit County.

(From Our Special Correspondent.)

Park City Shipments.—During April the only smelter products forwarded from the Mackintosh Sampler were 2 lots of Anchor concentrates, amounting to 411,485 lbs. In the week ending May 6th there was one lot of Anchor concentrates, 199,485 lbs., sent out. Shipments from Silver King, Ontario, Daly West and Daly were prevented by impassable roads. Ontario and Silver King began hauling ore to the sampler on May 5th, and the Daly West road is about open. The Mackintosh rolk expect their sampler will be kept running day and night. Never were the roads so bad as during the past 6 weeks. The May output will make a new record.

Marsac Mill.—Alterations and improvements will be completed by May 31st, when the mill will begin the season's run. The capacity will be increased from 70 to 100 tons per diem. It is believed this is the only plant in the country which uses the Russell process.

Silver King.—It is expected that the new concentrator will start about May 10th.

Weber & Kearns Concentrator.—This mill began the 1899 campaign on May 4th. It handles the dump of the Silver King.

Tooele County.

(From Our Special Correspondent.)

Overland.—Of late 80 tons per day were put through the mill, but by the addition of another solution tank and more precipitating boxes this tonnage is doubled and soon will be further increased. The metallic extraction is remarkably clean. In the mine, levels from bottom of main shaft are driven 200 ft. north and 230 ft. south, with crosscuts showing an average of 10 ft. of good cyaniding ore. Exploration below this level will soon be begun.

Chloride Point.—The road up Lion Hill is open and the mill will probably resume operations in a few days.

Kismet.—No West Dip development undertaking is better equipped with surface betterments, including steam plant. Incline is down 300 ft., with no crosscuts as yet driven on vein. Exploration is steadily advanced. Messrs. Thomas Weir and Geo. A. Lowe are the principal owners.

Mercur.—On May 5th work began re-cyaniding tails from the Manning Mill. There is a large amount from former runs which carry \$3 gold, and 100 tons per day are to be handled in addition to the 400 tons sent from the mine. So far as can be learned contracts are not yet placed for the roasting annex to the mill.

Omaha.—Steps are being taken toward building a mill the coming summer.

WASHINGTON.

Ferry County—Republic.

(From Our Special Correspondent.)

Black Tail.—The surface prospecting work is quite extensive. Some leads on the claim striking away from the main vein are locally termed crossveins, but are probably only spurs. On one of these are 2 pits showing one well defined wall and a ledge from 3 to 5 ft. wide. The Lone Pine, Pearl and Surprise to the north and east may show similar conditions, as the Quilp, adjoining on the south, certainly does.

Bodie.—The machinery installed consists of an Orr & Sanborn 14 H. P. double cylinder 6 x 8 engine, with flat reel to carry a ½ in. wire; an upright O. & B. steel boiler, and a No. 5 Cameron sinking pump. The shaft is down 115 ft. on the footwall, the vein, clear quartz, assaying \$11 a ton, showing about 8 ft. wide at the bottom without touching the hanging.

Dora.—The shaft is down 75 ft. and a cross cut is expected to strike the foot wall of the vein when 30 ft. in.

Dude Fraction.—The "Jim Blaine, Jr." tunnel is cutting through quartz stringers and the main vein, the north extension of the Princess Maud, may be encountered shortly.

El Caliph.—The shaft is down 63 ft. There is a lot of very rich ore piled up in the shaft house, evidence of what has been taken out. The tunnel is in 325 ft. and may cut the vein any day.

Flag Hill.—All of the ordinary prospecting work has been dropped and a tunnel has been started from the southeast side of the hill to run west. It will cut the rich El Caliph vein first, if it extends far enough, and will then crosscut the veins that have been prospected in Flag Hill ground.

Golden Chest.—A tunnel in 62 ft. cuts a quartz ledge, 6 ft. wide at 32 ft. A winze is down on the lead 14 ft. The assays run from \$1.25 to \$6.80 per ton.

Gold Hur.—A 2 ft. vein has been exposed on the east side of the claim and another at the south end. There is also a 2-ft. vein of soft ore which carries considerable arsenical iron and ½ in. of clean quartz. The values run from \$1.03 to \$15.70 in gold.

Liberty.—Work is temporarily suspended again in the shaft to prospect the surface.

Lily R.—This property on the west side of Copper Mountain, about 4 miles from Republic, has a vein of gold and silver ore. The vein has been stripped and the assay values run from a few dollars up; will average about \$14. A tunnel has been driven on it 25 ft. The quartz in the vein is mixed with chlorite schist, an assay from which ran \$6.61 in gold and 12 1-10 ozs. silver per ton.

Lone Pine.—The main tunnel is in 102 ft. to the vein now under development and 182 ft. in all. It is being continued to prospect the ground. The drift on ore is in 195 ft. and will reach the east side line in 40 ft. The winze at 125 ft. in, down 25 ft. in \$30 ore, is temporarily abandoned on account of water. The drift follows the footwall, where the vein is 5 or 6 ft. wide and the ore assays from \$20 to \$30 per ton. A small tunnel is being run on a 2-ft. quartz vein only a few feet from the east side line, which runs obliquely towards the center of the ground. It gives assays of from \$50 to \$60 per ton.

Morning Glory.—The tunnel is still going ahead, but beyond that no information can be had from the management. There is no sign of ore on the dump, so one of two facts remain; there is no ore in the tunnel, or the ledge is being stripped, the tunnel running alongside of it. Should the latter prove true, it would not be a very good thing for the shareholders. The reasons are obvious.

Noble Three.—The shaft is down 78 ft. and may cut the ledge 20 ft. deeper.

North San Poil.—The shaft is going down and 10 tons of ore daily are raised. The values continue to hold up well. The shaft is over 100 ft. deep.

Orphan Boy.—The shaft is down 24 ft. The vein is 4 ft. wide, 2 ft. of white quartz going down with the hanging. A 6-in. stringer of blue quartz, with finely matted iron sulphides, is part of the vein filling. An assay of the white quartz ran \$14.30 in gold per ton.

Payne.—A tunnel is in 100 ft. No vein is shown by surface croppings, but the ground is situated so that blind veins may run through it from adjoining claims.

Republic Consolidated Mining Company.—Work is resumed in the No. 4 tunnel, in 287 ft. A contract was let April 29th to run the tunnel 1,350 ft. further to the vein, which it will intersect at a depth of 600 ft., 200 ft. below No. 3 tunnel. On its completion the ore can be taken to the mills by the mine cars direct. The mine from top to bottom looks as well as it can, and can produce much more ore than the mill can treat.

Summit.—A tunnel is in 136 ft. The north branch from the mouth of the tunnel is in 80 ft. No improvement is yet shown.

Surprise.—Several cuts across the vein show a pay shoot 50 ft. long on the vein. From No. 1 cut several assays gave: Lowest, gold, \$8.06; highest, gold, \$40.31; silver, \$16.92; total, \$57.23. The highest average values are in the hanging wall, ranging from \$30 to \$50, and the lowest on the footwall, running about \$17 per ton. No. 2 cut gave assays: Gold, \$4.75 to \$7.85; silver, \$3 to \$4. A shaft will be sunk on the hanging wall, which is smooth and well defined.

Okanogan County.

(From Our Special Correspondent.)

Crystal Butte.—On this claim, on Myers Creek, a shaft has been sunk 100 ft. on the ledge, from which high grade ore is taken. A crosscut will be run 165 ft. for development and ventilation. A mill plant has been ordered and is now on the way.

Golden Zone.—W. E. Garrigues of Pittsburg, Pa., has taken charge of and will superintend the erection of a 60 ton concentrator and farther development. There are now 4 tunnels in, aggregating 2,000 ft. each, 150 ft. above the other, the lower one starting about 100 ft. above the base of the mountain. Sufficient ore is said to be blocked out to run the concentrator 1 year. The assay values are reported to average over \$30 in gold.

Hidden Treasure.—This company, at Conconully, has run a 225-ft. crosscut tunnel and cut the main ledge 14 ft. without reaching the foot wall. About 200 tons of ore was taken out in running the crosscut. Assays run from \$50 up, principally in silver, with a small per cent. of lead. Arrangements are being made to begin shipping.

FOREIGN MINING NEWS.

AUSTRALASIA.

New South Wales.

Broken Hill Proprietary Company.—For the four weeks ending April 27th this company reports 23,907 tons ore treated. The refinery output was 452 oz. gold, 378,388 oz. silver, 3,143 tons lead, 61 tons hard (antimonial) lead, and matte containing 72 tons copper and 11,664 oz. silver. The total silver was therefore 390,052 oz. The average return was 13.4% lead, 16.3 oz. silver and 0.02 oz. gold to the ton.

Queensland.

The Mines Department reports for March a total yield of 86,375 oz. gold for March, of which 2,117 oz. only was from alluvial workings. The month shows an increase of 11,903 oz. over March 1898. For the three months ending March 31st, the total output was 205,542 oz.; showing an increase of 11,452 oz., or 5.9% over last year.

CANADA.

British Columbia—Nelson.

Hall Mines, Limited.—This company reports for the four weeks ending April 28th that the smelter ran 7 days 3 hours, and 2,086 tons ore were treated. The yield was 35 tons copper and 29,530 oz. silver; an average of 1.7% copper and 14.2 oz. silver to the ton.

British Columbia—West Kootenay District.

Iron Mark vs. Centre Star.—This case, which had been on trial at Rossland for 15 days, with prominent mining engineers as experts on either side, came to an abrupt end, when the case was adjourned sine die on application of the Iron Mark Company. Much of the testimony of the experts summoned was contradictory, and the actual merits of the case are unknown. The development work already done throws little light on the continuity of the vein in dispute. The costs of the trial were put on the plaintiff.

(From Our Special Correspondent.)

Rossland Ore Shipments.—The shipments from Rossland mines for the 4 months ending April 30th amounted to 34,000 tons, and to May 4th, 36,000 tons.

East Le Roi, Great Western.—Work on this property is temporarily suspended.

Homestake.—Drifting continues at the 200 ft. level, and a crosscut has been started from the drift running south. The mine has been flooded to 2 ft. above the lowest station and a pumping plant has been installed.

Iron Horse.—A small shoot of ore has been cut in the last crosscut of the north drift.

Le Roi.—About 350 tons of ore are being shipped daily to the Northport Smelter. A station is being cut at the end of the Black Bear tunnel, where a hoist is being installed. The incline shaft is being timbered to the 600 ft. level.

Mascot.—Tunnel No. 2 at this Rossland property is in 670 ft. A crosscut has started to tap the ledge about 125 ft. away. The winze is down 100 ft. and is in 4 ft. of solid ore. Tunnel No. 3 is in 535 ft. and it will be driven 150 ft. further before it is crosscut.

No. 1.—The station on the 300 ft. level has been completed. Sinking to the 400 ft. level has begun.

Payne.—This company gives notice in the official gazette that a general meeting of the company will be held at Sandow on May 29th, for the purpose of disposing of the entire assets, rights and privileges, etc.

Slocan Ore Shipments.—The present weekly shipments of ore from the Slocan Mines are given at: Payne, 312; Last Chance, 100; Jackson, 15; Rambler, 20; Whitewater, 68; total, 515 tons. This ore went to Omaha, Great Falls, Everett, Kaslo and Pueblo.

Velvet.—The crosscut at the 250 ft. level of this Rossland mine is making rapid progress.

War Eagle.—The management reports the discovery of a 6 ft. vein of iron and copper pyrites in the shaft at the 750 ft. level. The ore is high grade.

Ymir Ore Production.—The total quantity of ore crushed and shipped from the mines of Ymir for the 4 months ending April 30th is as follows: Ymir, 2,250; Porto Rico, 1,400; Dundee, 750; total, 4,400 tons. The additional quantity shipped and not crushed is given as 2,600 tons from the Black Cock, Tamarac and New Victor.

Ontario—Rat Portage District.

Burley.—At the water location, sinking continues. The shaft is down 180 ft. The Sultana vein was struck at the 154-ft., and it is the intention of the company to continue sinking to 250 ft., when the ore will be mined and shipped to the reduction works at Keewatin.

Regina.—The main shaft is down 460 ft. The average value of the ore is \$10. From the reconstruction of the company in 1896 to January 30, 1899, 2,215 tons of ore were mined, yielding 1,040 oz. gold.

Hammond-Reef Gold Mining Company.—This company has completed arrangements to erect a large stamp mill at its mine on Saw Bill District and some of the machinery has already been shipped. The reef is from 100 to 200 ft. wide and averages about \$4 in gold per ton.

Mikado.—Mr. McMillan has been appointed manager and Mr. Breidenbach has taken charge of the Sirdar Mine, an adjoining property owned by a Toronto company. The output of the Mikado for year ending September 30th, 1897, was \$36,920; for year ending September 30, 1898, \$69,435. Considerable of the Mikado ore, however, has proved to be refractory and the returns for 1897-8 were from the free milling ore only. The company has now erected a cyanide plant capable of treating 1,600 tons a month, and with the reserve tailings on hand and the output from the mine, it is probable that \$100,000 will be produced in 1899. Very rich pockets of gold have been mined, but the main body averages about \$20 per ton.

Sultana.—It was published in London that the mine had been purchased by the British America Corporation, but the report is not confirmed here. It is estimated that \$710,000 worth of ore is in sight and with the 10-stamp mill the mine produced in 1896 \$51,000; in 1897, \$59,000. At the beginning of 1898 the new 30-stamp mill with complete chlorination plant had been installed on the property and the return for 1898 is estimated at \$150,000.

Ontario—Seine River District.

(From Our Special Correspondent.)

Emma Abbott and Gold Bug.—These properties, respectively east and west of the Alice A., on its vein, are being developed and for both machinery is to be taken in this spring. Both are largely owned in West Superior, Wis.

Golden Crescent.—This company has purchased locations A D 2, 3 and 4, on Seine River, and at a recent meeting in Duluth elected these officers: President, H. M. Bradley; vice-president, J. B. Kehl; secretary, G. H. Claypool; treasurer, C. F. Leland, all of Duluth. The purchase of machinery and beginning of development was authorized at this meeting.

Golden Star.—At a recent meeting in Duluth the capital was increased from \$1,000,000 to \$1,250,000, half of this being to pay L. A. Hall, of New York, some \$85,000 for development, and the rest for a stamp mill and other improvements. The mine is now paying a 1% monthly dividend and is turning out with a 10-stamp mill some \$20,000 a month in free gold and \$5,000 in concentrates. It is working 50 men.

Lucky Coon Mining Company.—This property has begun developments after a long period of idleness. Pumps and other machinery are on the way and the mill will start up shortly from rock taken out in development work. The property is controlled at West Superior, Wis., though there are many stockholders at Minneapolis and Milwaukee.

Olive.—The mill is now working. Reports are that the rock runs about \$20 to the ton, free milling.

Randolph.—This property is sinking and beginning work and is expected to be an important mine. Double crews are now at work. The mine is controlled in West Superior, Wis.

Quebec.

Canada Petroleum Company.—This company has been organized in London with a capital of £1,500,000, to take up a tract of 45,000 acres of

land in the Gaspe District. The explorations for oil have been going on there for several years. The land includes access to deep water and sites for wharves for shipping.

MEXICO. Chihuahua.

Barranca del Cobre.—This copper property is 150 miles southwest of Chihuahua and about 100 miles north of Batopilas. The ore is copper-glance, containing gold and silver. It is reported to run 12% copper, with enough free gold to pay the milling costs. The mill plant comprises a 12-stamp mill, a Huntington mill and Frue vanners. The vein, which is from 2 to 18 ft. wide, has a dip of about 60° and outcrops on both sides of a great chasm 3,000 ft. deep. It is worked entirely by drifts, the lowest opening being just above the stream in the bottom of the chasm. Mexican owners worked it for gold, and later an English company spent a large amount of money in improvement, but the distance from a railroad and the cost of getting in supplies by mule train has kept down development. The completion of the Chihuahua & Pacific Railroad will, however, improve transportation facilities. The property is now owned by the Lewis Company, of Mexico City and New York, that proposes to develop it on a large scale, increasing the output to 100 tons of ore daily. The ore now going to the mill is taken wholly from development work.

(From Our Special Correspondent.)

Compania Minera del Oro.—The new smelter in Santa Barbara District is smelting the ores of the Madronos Mines. The smelter and mines are the properties of Messrs. L. S. Kempfer, Joe Fruedenstein and M. Everett.

San Barbara District.—The new machinery for the mines of Pedro Erquicia has been erected. A. Maurer has recently put up a small reduction plant on his property.

Santa Eulalia District.—The plan to run a tunnel under the group of mines at Santa Eulalia, which H. S. Jacobs, of Colorado, has proposed, is meeting with success and a company is to be organized at once under a charter from West Virginia. The capital is to be \$5,000,000 Mexican currency, one-half of which will be needed to construct the tunnel. The plans contemplate a tunnel 3 miles long, 1,200 to 1,800 ft. deep. A standard gauge railroad will run from the mouth of the tunnel to the City of Chihuahua, 10 miles distant.

Guerrero.

(From Our Special Correspondent.)

New Mines.—Don Carlos Eisenmann recently denounced 800 hectares of cinnabar deposits near Santa Cecilia. The Amadita is another cinnabar mine denounced near Atenango del Rio near Tlactitepec. Six gold and silver properties have been taken up in the last 2 weeks.

Hidalgo.

(From Our Special Correspondent.)

Potencia Electrica.—This company, owning the electric pump which supplies 1,100 H. P. from the Baranca to the Dificultad, San Rafael and Barron mines, Pachuca, will shortly increase their plant to supply power for the pumps of Cabrera, the property of the Real de Monte Company, situated immediately north of the San Estevan property.

San Estevan.—The Real de Monte Company is arranging with the San Estevan Company, Pachuca, for permission to drive a cross cut from the Escobar Mine to cut the Cabrera Lode in the San Estevan. This work will drain and ventilate San Estevan to a considerable extent. The drift is being driven at an average of 5 meters per week and at that rate the lode should be cut by the first of June.

Michoacan.

(From Our Special Correspondent.)

Inguaran Mines.—Mr. C. Laforge, managing director, denies that the Rothschilds have any interest in these mines. The company which bought the Inguaran mines is entirely French. A large amount of prospect work is being done. The preliminary surveys for the railroad to the port of Zihuatenejo, on the Pacific coast, 200 kilometers distant, have been completed and the plans are filed in the City of Mexico. The road will not only make an outlet for the products of the Inguaran mines, but will open a belt of country heretofore inaccessible.

Sonora.

Minas Prietas Company.—At this company's mines at Minas Prietas, 8 Huntington mills are in use, and at La Colorado, 1 mile distant, are 10, making 18 Huntington mills used by this one company.

(From Our Special Correspondent.)

Cinco de Mayo.—This property, adjoining the Dos Cabezas, is turning out about 5 tons of ore per day. About 3-5 of the ore is high grade, carrying 200 oz. of silver or more, and is shipped to El Paso. The low grade goes on the dump to await the building of the smelter.

Promontorio.—This silver property, at present bonded to an English company for \$45,000, is making heavy shipments to El Paso.

COAL TRADE REVIEW.

New York. Anthracite.

May 11.

The hard coal trade shows little change, as compared with last week. Consumptive demand all over the country has fallen off, and has nearly got down to the regular summer basis. Little or no improvement is to be expected before fall or late summer. The market, however, continues to show a commendable degree of firmness, the great mining and transportation companies apparently being more harmoniously inclined than for several years.

The movement of coal to Chicago and the head of the Lakes to replenish docks promises to be extremely heavy. The strike among the longshoremen at Buffalo has hindered shipments somewhat. At all points the demand for anthracite is limited to small orders.

The report of disaffection among the miners of the anthracite region, doubtless has some basis; the nominal wages of the miners are good enough, but with collieries running one or two days a week the earnings are small indeed. However, it is not likely that a strike would trouble the companies much. If it lasted well into the summer it would enable them to ask a higher price for coal, which consumers, with winter demand in sight, would have to pay, while the miner would very likely return to work for a slight advance in wages and the prospects of steady work for some time ahead. With bituminous coal making steady inroads in demands previously supplied by anthracite, strikes among the anthracite miners for higher wages will not do much permanent good to any one. The demand of the Miners' Union for recognition simply complicates the situation.

Prices for coal are unchanged at circular rates.

Notes of the Week.

The stockholders of Delaware & Hudson Company have adopted a plan for the gradual retirement of the stock and bonds of the company. There is to be credited to the sinking fund a sum of not less than 5c. a ton for all coal mined. This sum is to be invested, as the managers may dictate, in the stock or securities of the company, or of a company owned or leased. In case such investment may be inexpedient, the money may be invested temporarily otherwise. No permanent investment under this sinking fund may be reissued, but is to be retired and canceled.

At the annual election the following managers were elected: James Roosevelt, Robert M. Olyphant, William H. Tillinghast, Alfred Van Santvoord, Alexander E. Orr, Chauncey M. Depew, James W. Alexander, James R. Taylor, Horace G. Young, John Jacob Astor, R. Somers Hayes, Frederic Cromwell and David Wilcox.

Bituminous.

The seaboard soft coal trade is duller than it has been. Producers find that orders are either just about keeping up to deliveries, or show a comparative decrease. No producers are thought to have orders very far ahead, and the movement from the mines has been curtailed. There has been a scarcity of vessels at Philadelphia and the Chesapeake Bay ports. A large fleet at far Eastern points has been detailed more or less and when it gets back to shipping ports freight rates are expected to weaken a little. Still, consumers are beginning to realize that rates are not likely to be as low this year as last, and are making plans accordingly. It seems likely that freight rates will not go much below 60@65c. from Philadelphia to the Sound ports and 70@75c. from Philadelphia to Boston, Salem and Portsmouth.

The demand for coal has weakened most in Long Island Sound territory. Demand from the far East has also fallen off, causing some wonder among producers, as the movement East has not been as heavy as anticipated. New York Harbor business is lighter, but all rail trade holds up well. The export trade is taken care of by contract orders. Transportation from mines to tide is generally good and car supply sufficient.

The current vessel rates from Philadelphia are 65c. to Sound ports and 80c. to Boston. Prices are unchanged on a basis of \$1.60@1.65 for best grades at Philadelphia and the Chesapeake Bay ports.

Chicago.

May 10.

(From Our Special Correspondent.)

Anthracite Coal.—Anthracite coal sales are rather scarce, with only a few carloads to any one concern. Seemingly, dealers have stopped buying because of the May circular, but warmer weather has been the chief cause. There is some uncertainty among dealers as to prices beyond May, the sales agents having positively stated that May prices were for May, and not beyond. May circular calls for \$4.75 for broken, and for domestic sizes, \$5. The receipts of hard coal by lake are now large. It is expected that more coal will come in by water this summer than in years. The scarcity of hard coal

throughout the West is noticeable, and the summer's trade ought to be excellent.

Bituminous Coal.—Sales have dropped somewhat, principally owing to the warmer weather and lessened demand for heating purposes. Manufacturing concerns continue to be large purchasers, and inquiry from them indicate continued good buying for a couple of months ahead. There is a plentiful supply of soft coal in the city. The lessened demand and the fact that the mines are producing as much as a month ago would indicate that there will be no scarcity of soft coal here this year. Prices remain fairly firm, with no indication of sagging.

Pittsburg.

May 11.

(From Our Special Correspondent.)

Coal.—There have been no river shipments during the week; the daily runs from the pits aggregate 1,315,000 bu. There is a good local demand without any change in prices. The proposed consolidation of Monongahela coal interests is attracting a good share of attention; options have been secured on all mining on the river. Appraisal has started. The syndicate will get about 50 plants, 100 towboats and 300 other craft consisting of model boats, barges and other craft; options have been received on every coal mine on the Monongahela River with the exception of three; all are legally executed and are in possession of Whitney & Stephenson, bankers of this city, the local underwriters of the projected coal combination. Nearly 50 mines, comprising thick and thin vein coal, will be included in the combination, the success of which seems to be assured.

Connellsville Coke.—Trade was not so vigorous last week as the few weeks previous. The active list was increased 232 ovens, but the running order was cut down some and production fell off 2,328 tons. The shipments were over 5,000 tons less than the week previous. The demand for coke for Pittsburg was fairly good and orders from the East held up fairly well all the week. Points west of Pittsburg made the worst showing. The far West is taking coke very freely and is giving evidence of a big summer's run. The most important event to the Connellsville Region the past week was the voluntary advance in wages by the H. C. Frick Coke Company. The advance was entirely unsolicited and unexpected and came about solely through the established policy of the Frick company in lowering and raising wages with the trade conditions of the region. The advance was promptly adopted by all other operators and made uniform throughout the region. The wage rate is much higher than is paid in any other mining or coke making district, and is the highest average wages ever paid in the Connellsville region. Coming as it did without solicitation, it has given great cheer to those connected with the coke industry and is considered an indication of assured harmonious action in this region. The region now has the largest active list of ovens in its history.

The outlook now is that every available oven in the region will be in operation in the next 30 days. It will require \$80,000 a month to pay the Frick Coke Company's advance. Ovens in blast, 16,773, and 2,134 ovens idle. Production, 177,992 tons. Shipments to Pittsburg, 3,112 cars; sent West, 4,889 cars; shipped East, 1,737 cars; total, 9,738 cars.

SLATE TRADE REVIEW.

New York.

May 12.

Everywhere increased activity is reported, especially in those districts where large export orders have been taken.

The roofing slate interests are underselling each other, but they are careful not to cut too near the actual cost of production. A more peaceful policy is prevalent among mill stock people, though we hear of occasional concessions on favorable orders.

In export circles a more hopeful condition exists, though it is feared in some directions that the reduction in prices abroad will force us out of the foreign market. We believe, however, that the more aggressive of our exporters can overcome this difficulty. Even at the present low prices at which we have taken orders in Great Britain, we are underselling the Welsh quarrymen in some instances \$1@1.50 per square of roofing slate.

The freight market at New York is unchanged. To London, 12s. 6d. (\$3), or about 86c. per square roofing slate; Liverpool, 12s. 6d.; Manchester, Bristol, Leith and Glasgow, 15s. (\$3.60), or \$1 per square; Hamburg, 12s. 6d. prompt, and 15s. near future; Copenhagen, 16s. 3d. (\$3.90), or \$1.11 per square; Newcastle and Hull, 17s. 6d. (\$4.08), or \$1.17 per square; Denmark, Stettin, 17s. 6d., all with a 5% primage per ton weight. To Bremen the rate is 15s. net (\$3.60), or \$1 per square. To Sydney, New South Wales, 15s. net is asked for roofing slate in cases or in bulk.

Exports for the week from Baltimore were: 45,413 pieces roofing slate, or 29 squares, to Belfast, Ireland.

The exports of slate from the United States in March were valued at \$132,447, as against \$123,555

last year. For the quarter ending March 31st, 1899, the exports amounted to \$316,743, as against \$311,265 in the corresponding period last year.

Blackboards are quoted from first hands at 10, 11 and 12c. per sq. ft., according to size, while second hands ask 1c. more. Billiard table tops are quoted at 18c. to 25c. per superficial foot, as to quality and class of work required. Large buyers can doubtless shade these prices. Some makers quote marbled slate as to quality and workmanship at 40@80c. per superficial foot, while others are understood to be selling at less. Pencils made from ground slate and other ingredients vary in price according to size (5 in. to 7 in.) from \$1@1.50 per 1,000. Discounts are allowed large buyers.

The list of prices per square for No. 1 slate standard brand f. o. b. at quarries is given below.

Prices of Roofing Slate.

| Size, inches | Monson or Br'n Vile. | Bangor. | Bangor Ribbon. | Alb'n. or Jackson Bangor. | Lehigh. | Peach Bottom. | Sea Gr'n. | Unfad'g Green. | Red. |
|--------------|----------------------|---------|----------------|---------------------------|---------|---------------|-----------|----------------|------|
| 28 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 26 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 24 x 16 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 24 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 24 x 12 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 24 x 10 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 22 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 22 x 12 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 22 x 10 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 20 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 20 x 12 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 20 x 10 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 18 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 18 x 12 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 18 x 10 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 16 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 16 x 12 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 16 x 10 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 14 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 14 x 12 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 14 x 10 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 12 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 12 x 12 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 12 x 10 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 10 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 10 x 12 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 10 x 10 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 8 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 8 x 12 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 8 x 10 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 6 x 14 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 6 x 12 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |
| 6 x 10 | 6.10 | 3.35 | 2.75 | 3.10 | 3.50 | 4.75 | 2.40 | 3.50 | 4.00 |

A square of slate is 100 sq. ft. as laid on the roof.

In Brownville and Monson delivery quotations can be had somewhat lower than above, which is also true of other brands. No. 1 Bangor are 50c. extra when full 3/16 in. thick, and Peach Bottom 25c. extra per square. Purple sizes run 24x12 and 14x7, and vary from \$3.75 to \$4 per square. Variegated and mottled, \$1.75@2 per square, according to size. Intermediate red, 14x7 and larger, \$6; 12x7 and 12x8 in., \$5 per square, net.

CHEMICALS AND MINERALS

(For current prices of chemicals, minerals and rare elements, see also page 572.)

New York. May 12.

Heavy Chemicals.—Domestic alkali for immediate delivery continues scarce. Sales of high test are said to have been made by jobbers at 72½@75c. per 100 lbs., and at the close they quote 85@90c. in New York, while first hands have not changed their prices. Caustic soda for next year's delivery has been contracted for in a large way at about \$1.40 per 100 lbs. f. o. b. works. Sal soda, and bicarb soda, are in good request. Bleaching powder has been reduced in price, owing to a limited demand and much competition. Cable advices from the Continent report better prices and makers' stocks not large. Chlorate of potash is steady, and crystals have been quoted up to 10c., but at the close this week prices are lower. The American Alkali Company, referred to in our last issue, has been granted a charter in New Jersey. Of the \$30,000,000 capital stock, \$6,000,000 is in preferred stock carrying an 8% dividend, and \$24,000,000 common stock. The incorporators are Frederick Maurer, Josiah S. DuBois, Clayton E. Platt and William J. Jackson. The company will manufacture alkali and deal in all kinds of chemicals. This concern is not taken seriously by leading people in the trade. The imports this week at New York included 505 bbls. and 29 casks bleaching

powder. Receipts of domestic products included 90 kegs and 83 casks potash, 91 drums caustic soda, and 155 bbls. and 1,720 sacks soda ash. A small export trade has been done.

Quotations are: Caustic soda, domestic, high test, \$1.37½@1.42½ per 100 lbs. f. o. b. works; \$1.55@1.65 delivered. Foreign caustic soda, high test, \$1.60@1.70 delivered, according to test and quality. Powdered caustic soda, 2½@3c. Alkali, domestic, 65@70c.; sales reported over next fire at 62½@65c. in bags f. o. b. works; 75@80c. delivered; foreign, 75@80c. Bleaching powder, Liverpool prime brands, \$1.45@1.50 per 100 lbs.; other brands, \$1.30@1.40. Continental F prime, \$1.45@1.50. Bicarb soda, domestic, ordinary, \$1.12½@1.25 per 100 lbs. f. o. b. works. Natrona brand, \$1.65. "Arm and Hammer" brand, \$3.25@3.50, less the usual discount; foreign, \$2.12½@2.25 per 100 lbs., according to brand and style of package. Sal soda, domestic, 50c. per 100 lbs. f. o. b. works, less the usual discounts; English, 60@62½c. per 100 lbs. Concentrated sal soda, foreign (crystal carbonate), \$1.60@1.70 per 100 lbs.; domestic (mono-hydrate crystals), \$1.25@1.35 per 100 lbs.; "snowflake," \$1@1.12½ f. o. b. Syracuse. Chlorate of potash, crystals, 9¼@9½c.; powdered, 9½@9¾c.

Acids.—Spot supplies of blue vitriol are scarce, and makers are firm at quotations. We note 281 bbls. came to this port from Baltimore for export. The total exports of blue vitriol from the United States in March amounted to 5,389,316 lbs., valued at \$239,462, or \$4.45 per 100 lbs., against 5,082,139 lbs., \$160,239, or \$3.15 per 100 lbs. last year. This year's export price is about \$1.20 per 100 lbs. less than the New York market value. The exports of all other acids from the United States in March amounted to \$12,113, showing an increase of \$2,746 as compared with the same month in 1898. Business in April is reported to have been good, especially in sulphuric and muriatic acid. Prices are unchanged.

Quotations per 100 lbs. for New York and vicinity are as follows: Acetic acid, commercial, No. 8, \$1.40@1.50; muriatic acid, 18", \$1.10 for drums, and \$1.15@1.75 for carboys, 20", \$1.20@1.87½; 22", \$1.35@2.25, according to quantity and brand. Nitric acid, 36", \$3.50@4.75; 38", \$3.75@4.62½; 40", \$4@4.87½; 42", \$4.62@5.25. Oxalic acid, \$6.25@6.50. Mixed acids, according to mixture. Sulphuric acid, 66", \$1.10 for drums and \$1.15@1.75 for carboys. Chamber acid, 50", in a jobbing way, \$1.50@2 per ton f. o. b. factory. Blue vitriol (copper sulphate), \$5.37½@5.50 per 100 lbs. for best grades.

Brimstone.—Trade is dull, and prices low, owing to large stocks in the primary market. Arrivals here this week were 2,900 tons. In March the United States imported 15,652 tons, making a total of 28,935 tons for the first quarter of this year, which is 14,282 tons less than for the corresponding period in 1898. Exports in March, 1899, were 324 tons, against only 2 tons last year. Best unmixed seconds are quoted on spot at \$20@20.50, and futures at \$20.50@21 per long ton, while thirds are \$18.50@19.

Pyrites.—Business is regular, and prices firm. No arrivals this week at this port. Imports into the United States in March were 18,673 tons, valued at \$3.71 per ton, making a total of 56,048 tons for the first quarter of this year.

Salt Peter.—The arrivals in April were considerably larger than last year, amounting to 10,616 bags, and the consumption in the United States in the same month is reported at 9,614 bags, an increase of 3,623 bags over April, 1898. The stocks on hand May 1st were 7,324 bags, against 4,566 bags at the same time last year. The apparent supply according to advices is 16,806 bags, as against 24,806 bags last year. Crude is quoted at 3¼@3¾c. per lb., and refined at 4@5¼c.

Fertilizing Chemicals.—Sulphate of ammonia, gas liquor, has been very firm, and present prices are about 60c. per 100 lbs. more than for the corresponding week last year, and 76c. more than for the same time in 1897. Arrivals from abroad have been comparatively small, and this week amounted to only 1,000 bags from Leith. The production in Great Britain it is believed is kept well in hand by the members of the Sulphate of Ammonia Company, who are expected to pay a small sum per ton of what they produce. Prices all round have strengthened, and the animal ammoniates in Western packers hands are still small. A good export trade has been done with Honolulu. This consisted of 2,790 bags dried blood valued at \$10,350; 1,755 tons acid phosphate, valued at \$20,825, or \$11.86 per ton; 750 bags tankage, valued at \$1,350, and 267 bags fish scrap, valued at \$510; making a total of \$33,035, all shipped on the "Helen Brewer" on May 6th. We understand also that several thousand tons of slag were exported to Germany last month. Imports at New York this week were 1,250 bags sulphate of potash, 2,000 bags of potash, and 500 bags manure salt.

Quotations are: Sulphate of ammonia, gas liquor, spot, \$2.95@3.27½; shipment, \$2.97@3 (basis of 25%), per 100 lbs.; bone, \$2.70. Dried blood, high grade, Western, \$1.75@1.80 per unit f. o. b. Chicago; New York, \$1.80@1.82½ per unit. Azotine, \$1.75, basis New York. Concentrated phosphates (30% available phosphoric acid), 57½c. per unit. Acid phosphates, 13@15%, av. P₂O₅ 55@60c. per unit at sellers' works in bulk. Dis-

solved bone black, 17@18%, \$16@16.50 per ton. Acidulated fish scrap, \$10; dried, \$18.50@19 f. o. b. fish factory. Ammonia superphosphates, high grades, \$25@26 per ton. Tankage, high grade, \$14.50@15 per ton f. o. b. Chicago; \$18@18.50 at New York. Concentrated tankage, \$1.75 per unit at New York. Bone tankage, \$19.50@20.50, ground bone, \$23@25 delivered. Bone meal, Calcutta, \$22@23, and domestic steamed, \$18@19, and raw, \$24@25 per ton.

Potash Salts.—Quotations are on the basis of foreign invoice weights, tares and analysis to the ports of New York, Boston and Philadelphia, as follows, per 100 lbs., in quantities of not less than 500 tons bulk salts or 50 tons concentrated salts: Muriate of potash, 80@85%, basis of 80%, \$1.78, and 95%, \$1.81; sulphate of potash, 90%, \$1.98½, and 96%, basis of 90%, \$2.10½; double manure salt, 48@53%, basis ash, 66c., and 30%, 89c. For kainit, testing 12.4% actual potash, quotations are: \$8.70@8.95 per long ton of 2,240 lbs. Sylvanite is quoted at 37@38c. per unit sulphate of potash.

Nitrate of Soda.—Holders are offering more freely, as 42,794 bags have recently come to hand. Spot is quoted at \$1.60@1.62½ per 100 lbs., and futures, \$1.55@1.57½. The imports of nitrate of soda into the United States in March were 6,914 tons, as against 5,912 tons last year. Exports were only 36 tons, against 104 tons in March, 1899.

Messrs. Mortimer & Wisner's monthly statement of nitrate of soda, dated New York, May 1st, gives the following statistics:

| | 1899. | 1998. | 1897. |
|--|---------|---------|---------|
| | Bags. | Bags. | Bags. |
| Imp. into Atlantic ports from West Coast S. A., from Jan. 1 to date. | 181,283 | 257,673 | 147,399 |
| Imp. from Jan. 1 from Europe..... | ..... | ..... | ..... |
| | 184,283 | 257,673 | 147,399 |
| Stock in store and afloat May 1, in New York | 15,852 | 18,391 | 103,444 |
| Boston..... | ..... | ..... | 4,000 |
| Philadelphia..... | ..... | ..... | ..... |
| Baltimore..... | 500 | ..... | 5,000 |
| Norfolk, Va..... | ..... | ..... | ..... |
| Charleston..... | ..... | ..... | ..... |
| To arrive, due Aug. 15, 1899 | 347,000 | 286,000 | 207,000 |
| Vis. supply to Aug 15, 1899 | 363,552 | 304,391 | 319,144 |
| Stock on hand Jan. 1, 1899. | 58,406 | 15,383 | 123,593 |
| Deliveries past month.... | 86,809 | 52,477 | 30,775 |
| Deliveries since Jan. 1..... | 226,337 | 254,665 | 158,548 |
| Total yearly deliveries | ..... | 967,525 | 710,971 |
| Prices current May 1..... | 1.65c. | 3c | 1.87½c. |

Phosphates.—Demand is good, but deliveries are slow, owing to small stocks. Export market is higher. In March the total exports from the United States amounted to 73,475 tons, principally to Germany. The imports were 7,833 tons, as against 1,215 tons in the same month last year. These imports are chiefly from Belgium and consist of a low grade phosphate found in a pulverized state, which is used as a filler and dryer in making fertilizers. This phosphate has an import value of about \$3 per ton. Exports of Florida high grade phosphate rock from Savannah, Ga., in April, amounted to 8,545 tons, of which 5,163 tons went to Hamburg and the balance to Rotterdam.

We quote: Florida high grade, 75@80% rock, \$10 flat per long ton f. o. b. Fernandina. The freight rate to New York is about \$2 per ton. Florida land pebble, 68@73%, quoted at \$7@7.50 per ton delivered in New York; South Carolina ground rock, \$6 per short ton, delivered in New York; sun dried, \$3 per 2,240 lbs. f. o. b. Ashley River; hot-air dried, \$3.25 f. o. b. same place, and \$3.45 f. o. b. Charleston, S. C. Tennessee phosphate rock, \$5@5.50 f. o. b. mines for export, and \$3@3.50 for domestic brown, and \$1.90@2 f. o. b. for blue or Hickman County rock, ex-vessel, New York, \$9@10 for high grade rock. Domestic Tennessee rock averages 75%, while for export it runs as high as 83% bone phosphate. The difference in the price of this phosphate and Florida high grade is owing to the higher percentage of iron and alumina in the Tennessee rock.

Liverpool. May 3.

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

The demand for heavy chemicals is steadily maintained, but there is no special activity to note. Soda ash is in fair request at varying prices, according to destination. We quote maximum range for tierces about as follows: Leblanc ash, 48%, £4 5s.6d@£4 10s.; 58%, £4 10s.@£4 15s. per ton net cash. Ammonia ash, 48%, £4@£4 5s.; 58%, £4 5s.@£4 10s. per ton, net cash. Bags are 5s per ton under price for tierces. Soda crystals are in good demand at £2 17s. 6d. per ton, less 5% for barrels with special quotations for certain favored markets. Bags are 7s. per ton under price for barrels. Caustic soda is moving

off fairly freely, and prices are firm at £6 for 60%, £7 for 70%, £7 10s. for 74%, and £7 15s. per ton for 76%; all net cash. Bleaching powder is quoted at £4 17s. 6d. @ £5 per ton, net cash for hardwood, and manufacturers are well filled with orders. Chlorate of potash is quiet but steady at 3½@3¾d. per lb. for crystals, and 3½@3¾d. per lb. for powdered, as to quantity. Bicarb. soda is selling to a moderate extent at varying prices, according to market, ranging from £5 5s. @ £6 15s. per ton, less 2½% for the finest quality in 1 cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia is only offering sparingly, and although the temporary squeeze is over, quotations are still maintained at about £11 11s. 3d. @ £11 12s. 6d., less 2½% for good gray 24@25% in double bags f. o. b. here. Nitrate of soda is still declining, and £8 5s. @ £8 7s. 6d. per ton, less 2½% is about nearest range to-day for double bags f. o. b. here.

IRON MARKET REVIEW.

NEW YORK, May 12, 1899

Pig Iron Production and Furnaces in Blast

| Fuel used | Week ending | | From | |
|-----------------|---------------|----------------|------------|------------------|
| | May 13, 1898. | May 12, 1899. | Jan., '98. | Jan., '99. |
| An'racite | 27 | 18,825 | 34 | 30,150 |
| Coke..... | 149 | 209,475 | 154 | 211,900 |
| Charcoal. | 18 | 6,625 | 17 | 4,925 |
| Totals.. | 194 | 234,925 | 205 | 246,975 |
| | | | | 4,407,717 |
| | | | | 4,540,908 |

The iron market continues very strong, but comparatively quiet. Negotiations over supplies for the second half of the year continue, but very little business has been actually closed. Buyers of raw iron and steel have their supplies arranged for up to the end of June, as a rule, and are not disposed to force up prices further by undue haste.

Demand for finished material continues heavy, and some good contracts have been closed for bridge and building work. New electric railroad work is also calling for a good deal of material, especially in the neighborhood of New York; though other cities are not much behind. Export trade continues fair, notwithstanding high prices. Among foreign orders taken one is for an important railroad bridge in British Burma, for which the Pennsylvania Steel Company will furnish the material.

As noted last week, the Carnegie transaction is limited to the acquisition by a new company of all the mills, mines, railroads and coke works controlled by the Carnegie Steel Company. Mr. Andrew Carnegie retires. The capital stock and details of organization of the new company are not yet announced; nor is it known whether any of the stock will be offered to the public. The rumor of a billion-dollar company to control the entire trade dies hard, and still continues to come from various quarters.

Notes of the Week.

A strong speculative movement in pig iron has been exciting the market in Great Britain, and prices have reached the highest level known for years. Recently Scotch pig sold as high as \$15 a ton; Middlesboro pig for \$13.50, and West Coast Bessemer for \$15.25. This is partly a speculative movement, but partly also the result of a demand for near-by deliveries, which cannot be had at present. Stocks are unusually low.

The Virginia Iron and Coal Company, which included all the blast furnaces and ore lands in southwestern Virginia, has added to its possessions the property of the Watts Steel and Iron Syndicate at Middlesboro, Ky. The property includes a blast furnace and steel works. The Virginia company now includes the following companies: The Carter Coal and Iron Company, of Pulaski, Va.; the Pulaski Iron Company, Pulaski, Va.; the Graham Iron Works, Graham, Va.; the Crosser Iron Company, Roanoke, Va.; the Consolidated Coal and Iron Company, Max Meadows, Va.; the Camden Iron Works, Salem, Va.; the Embreeville Iron Works, Embreeville, Tenn.; the Home Iron Company, Bristol, Tenn.-Va.; the Johnson City Iron Works, Johnson City, Tenn.; the Watts Syndicate, Middlesboro, Ky. The company has \$15,000,000 capital stock. Its president is George L. Carter, of Pulaski, Va.

Chicago. May 10.

(From Our Special Correspondent.)

Pig Iron.—Sales of pig are not numerous, but a fair tonnage is placed each week. Some sales of lots over 1,000 tons are made, and inquiry indicates a better business for the month of June and thereafter. Furnaces are looking for increased prices, being sold far ahead and receiving right along a good supply of orders. Quotations are as follows:

Lake Superior charcoal, \$17@18; Local Coke Foundry, No. 1, \$15.50@15.75; No. 2, \$15@15.50; No. 3, \$14.50@14.75; Local Scotch Foundry, No. 1, \$15.50@15.75; No. 2, \$15@15.50; No. 3, \$14.50@

\$14.75; Southern Coke, No. 1, \$16@16.25; No. 2, \$15.25@15.75; No. 3, \$14.75@15; Southern, No. 1 soft, \$15.50@16; No. 2 soft, \$15@15.50; Southern silveries, \$15.50@16; Jackson County silveries, \$17@18; Alabama Car Wheel, \$17.50@18; Malleable Bessemer, \$15.50@16.

Bar Iron.—Business in bars has been fair with quite a good aggregate of sales. Orders mostly for small lots. Inquiry continues large. Common iron is quoted 1.60@1.70c. and steel bars 1.65@1.75c.

Structural Material.—Small business constitutes the demand, no larger contracts having been closed. Bridge material is in best demand, with a few contracts made for amounts of 2,500 tons each. Mills are, as a rule, full on orders, and the situation is exceedingly good. Prices are: Beams, 15-in. and under, 1.65@1.70c.; 18-in. and above, 1.75@1.80c.; tees, 1.70@1.75c.; angles, 1.65@1.80c.

Cleveland, O. May 10.

(From Our Special Correspondent.)

Iron Ore.—The iron ore market is very strong and the tendency is toward higher prices. That such is the case is due to a greater demand than might have been expected and the very small amount of supplies that can be offered in the present sold-out condition of the market. Some small amounts have been sold during the past week, consisting principally of odd lots remaining on Lake Erie docks. Liberal additions of ores will be made on Lake Erie docks within the next few days. Cargoes are now on the way down from Escanaba and others will soon be on the way from Lake Superior ports. These shipments are coming on season contracts made with several vessel owners. Few if any single trip engagements for transportation of ore are being made. Going rates are said to be 50c. per ton from Escanaba, and 60c. per ton from the head of Lake Superior.

The quotations are as follows: Specular and magnetic ores, Bessemer quality, \$4@4.25; specular and magnetic ores, non-Bessemer, \$3.25@3.75; red hematite ores, Bessemer quality, \$3.25@3.75; red hematite ores, non-Bessemer quality, \$2.50@2.75.

Pig Iron.—The pig iron market continues very firm, and though prices are no higher than already quoted, sellers are holding very firmly for those figures. Trade in metal was very good during the week. It has been chiefly in foundry iron; along this line very fair sales are reported. But little Bessemer is in stock or can be offered. The following are the present quotations for iron f. o. b. Cleveland: Lake Superior charcoal, \$16.50@17; Bessemer, \$15.25; No. 1 foundry, \$15.75; No. 2, \$15.25; No. 1 Ohio Scotch, \$15.65; No. 2 Ohio Scotch, \$15.15; gray forge, \$15.

Pittsburg. May 11.

(From Our Special Correspondent.)

The iron and steel markets are both strong and very much complicated; from the large transactions made during the past two weeks it would seem that some of the big plants were becoming short of raw material, which will account for several large sales of Southern mill iron, the latter sales being at an advance of 25c. a ton. But the outcome for the last half of the year is a good deal of an enigma, not because there is anything unfavorable in the business outlook, but because of the fuel and ore situation. Most of the big concerns are, no doubt, in a position to take care of themselves; at the same time there are a great many furnaces whose sources of supply are somewhat precarious, and there is just a possibility that they may have to pay pretty dear for their whistle, or perhaps be left in the lurch entirely. If there was a reasonable certainty of a full supply of ores, there might be room to doubt whether prices of iron and steel could be maintained, but it is this uncertainty that complicates the situation. Buyers and sellers are alike undecided what position to take, and are, in consequence, just hanging on until some distinct light can be had upon this important matter. The general feeling, however, is one of much confidence, and as may be inferred from certain contingencies, of great possibilities in connection with the market during the next two or three months. The May report of furnaces will be watched with a good deal of interest. It looks as though consumption of pig iron in the entire world has gradually been expanding, until it has taken up all the slack of available capacity, and as though a remunerative level of prices is assured.

Finished Material.—There is no change in general conditions. The demand is well up to high water mark; prices are firm at the highest point yet reached, and order books are in extremely good condition. There seems to be a willingness on the part of makers to enter orders quite liberally at current prices, but as a rule deliveries cannot be guaranteed to any extent until after mid-summer.

Scrap Iron and Old Rails.—There is a continued good demand, with prices being held steadily; iron rails are commanding the highest price for years.

Wrought Iron and Steel Pipe.—All the plants in this vicinity are very busy, with order books

crowded for some time to come; the late advance being fairly maintained.

Wire nails, and in fact all kinds of wire materials are in excellent demand. Sales range from \$2.20@2.30.

Muck Bar firm, with sales \$26.75. Stocks on market light.

Ferro-manganese.—Supply light, with a firm market.

Latest.—There is nothing of special importance to note in regard to the iron market. The general feature is the firmness of all kinds of iron and steel. The Carnegie transaction is the principal topic of conversation among all classes, who are wondering what will be the next movement. Requirements for May and June are pretty well provided for, and for later dates there is no marked disposition to either buy or sell.

COKE SMELTED LAKE AND NATIVE ORE.

| Tons | Cash |
|---------------------------|---------|
| 6,000 M. I., Southern, P. | \$14.70 |
| 5,000 M. I., Southern, P. | 14.75 |
| 5,000 M. I., Southern, P. | 14.75 |
| 5,000 M. I., Southern, P. | 14.70 |
| 5,000 M. I., Southern, P. | 14.70 |
| 3,000 M. I., J. A., P. | 14.50 |
| 2,500 B., J. A., P. | 14.60 |
| 2,000 B., M. J., P. | 15.25 |
| 2,000 Mill Iron, P. | 14.65 |
| 1,500 M. I., J. P. | 14.60 |
| 1,500 M. I., J. P. | 14.70 |
| 1,000 M. I., prompt, P. | 14.70 |
| 1,000 Mill Iron, J. P. | 14.60 |
| 1,000 B., M. J., P. | 15.25 |
| 500 No. 2 F. P. | 15.60 |
| 500 No. 2 F'dry, P. | 15.60 |
| 500 No. 1 F'dry, P. | 16.75 |
| 50 Bessemer, V. | 14.75 |
| 250 No. 2 Foundry, P. | 15.75 |
| 200 No. 1 F'dry, P. | 17.00 |
| 100 No. 1 F'dry, P. | 17.00 |
| 100 No. 2 F'dry, P. | 16.00 |
| 50 No. 2 F'dry, P. | 16.00 |

BLOOMS, BILLETS, SLABS.

| | |
|--------------------------|---------|
| 600 Billets, del. P. | \$26.75 |
| 500 Billets, del. P. | 26.70 |
| 500 Bilts, del. spot, P. | 26.75 |
| 350 Billets, P. | 26.50 |

MUCK BAR.

| | |
|-----------------|---------|
| 800 Neutral, P. | \$26.75 |
| 500 Neutral, P. | 26.85 |
| 500 Neutral, P. | 26.75 |

Philadelphia, May 11.

(From Our Special Correspondent.)

Pig Iron.—It is understood in iron trade circles that some business has been done within a few days on pig iron, but for some reason both sides are reticent as to details. From what is transpiring in other markets our makers are not disposed to depart from the policy they have been pursuing all spring. Prices remain just where they were. Foundry irons of standard brands will not be offered at any time this summer. Ordinary brands and irons from newly started furnaces have been within reach. The decline in car orders from 21,000 cars in round numbers in March to 5,000 in April, will in time be reflected in a lessened demand for forge for forward delivery, unless railroad managers should decide to pay the higher prices stipulated by car builders. Foundry irons all through are well sold up. Basic is also sold up.

Billets.—The advance at the mills has been followed by a corresponding advance here, and consumers are disturbed over it. There have been no large transactions reported since Monday, but there are negotiations.

Bar Iron.—The withdrawal of the car builders permits normal conditions to be re-established, though the mills are all oversold, and small buyers are in sight; common iron, 1.40@1.50c; refined, 1.60c.; tested, 1.70c.; special steel bars, 1.75@1.90c.

Nails.—There is some further improvement in retail lots from store.

Sheet.—This week's new business has been made up of orders for heavy sheets, galvanized iron and corrugated material, and some stuff for architectural iron works. Strong prices prevail.

Pipes and Tubes.—A good many small buyers are manifesting more interest in procuring material to cover the work they see ahead of them. Besides, there is the possible combination to be reckoned with.

Merchant Steel.—Several large buyers desire to place orders, and are asking to be permitted to do so at old figures. This request cannot be acceded to. Mills have too much work, and the prospects are too flattering to allow manufacturers to yield in the matter of price.

Plates.—The correspondence of our leading concerns for the past few days with intending buyers is interesting in what it points to. There are no signs of a reaction, and there is not the slightest disposition of manufacturers to make better terms; on the contrary, they see the elements focussing for stronger prices. The mills are all crowded, and business is improving. No change in quotations. Two large orders were placed this week.

Structural Material.—The reports all point to an unusually active summer, and to the filling up of all mills at paying prices. There are

SKELP IRON.

| Tons | Cash |
|-----------------|-------------|
| 500 Sheared, P. | \$1.90 4 m. |
| 450 gr'vd P. | 1.88 4 m. |

CHARCOAL.

| | |
|--------------------|---------|
| 2 5 No. 2 W. B. P. | \$17.50 |
| 150 No. 6 W. B. P. | 26.00 |
| 100 Cold Blast, P. | 23.00 |
| 50 Cold Blast, P. | 23.00 |
| 50 No. 2 F'dry, P. | 17.50 |
| 25 No. 2 F'dry, P. | 17.50 |

SKELP IRON.

| | |
|---------------------------|---------|
| 2,000 Iron Rails, gr. P. | \$30.25 |
| 2,000 Steel Rails, gr. P. | 14.00 |
| 1,000 Iron Rails, gr. P. | 19.75 |
| 500 Iron Rails, gr. P. | 20.50 |
| 500 Steel Rails, P. | 14.25 |
| 75 Steel Rails, gr. P. | 14.25 |

SCRAP MATERIAL.

| | |
|--------------------------|---------|
| 600 No. 1, C. S., gr. P. | \$13.50 |
| 500 Steel M. S., gr. P. | 14.00 |
| 400 Bush. Scrap, N. V. | 12.00 |
| 300 Mac. Tur. net, V. | 9.75 |
| 300 No. 1, W. S., n. v. | 16.00 |
| 300 S. S. P. E., gr. P. | 14.00 |
| 200 O. C. W., gr. P. | 16.50 |
| 200 Cast B'gs., n. v. | 9.50 |
| 200 H. M. S., gr. P. | 11.00 |
| 200 S. G. & F., gr. P. | 13.50 |
| 200 W. T., gr. P. | 19.00 |

further inquiries at hand from European agents for material. Railroad terminal requirements will be presented in June. All consuming sources are in the way of buying, and representatives believe from present appearances that a good deal of business will be closed in June.

Steel Rails.—There are no further developments. The accumulation of business continues at the mills; considerable work is allowed to remain at a standstill on account of the jump in prices. Business is about being closed in the way of exchanging old iron rails for steel rails.

Old Rails.—Recently offers of a good deal of old-rail stock has been made, and large transactions are on the eve of closing.

Scrap.—There are new and urgent orders out this week from large scrap consumers, and it is probable therefore that sellers' prices will be paid for all the scrap they can deliver.

New York, May 12.

There is little change to note in the local market. Orders are limited almost wholly to immediate needs, and prices show little or no change. In foreign business we note some good-sized shipments of mining machinery and manufactured iron to South Africa, amounting to nearly \$100,000; shipments of steam pumps, engines and machinery to France; \$12,000 worth of electrical and railway supplies to London; \$12,000 worth of manufactured iron to Havana, and \$16,000 worth of machine tools, and nearly \$13,000 worth of railroad material to Genoa.

Pig Iron.—Transactions are moderate, with quotations unchanged as follows: Northern brands, tide-water delivery, No. 1 X foundry, \$16.50; No. 2 X foundry, \$15.75; No. 2 plain, \$15.50; gray forge, \$15.25; Southern brands, New York delivery: No. 1 foundry, \$16.25; No. 2 foundry, \$15.75; No. 1 soft, \$15.50; No. 2 soft, \$15.25; No. 3, \$14.75; basic, \$15.

Warrant irons during the week have advanced after a weak opening. Alabama No. 2 foundry rose from \$11 to \$11½; No. 3 from \$10½ to \$10¾; No. 4, \$9½ to \$10¼, and gray forge, \$9½ to \$10¼.

Plates.—The local demand is light. Prices are generally unchanged, and we continue to quote for large lots at tide-water: Tank, ¼-in. and heavier, 2.25c.; shell, 2.35c.; flange, 2.45c.; marine, 2.70c.; fire-box, 2.75c.. Universals are 2.15c.

Bar Iron.—The local demand is fair. Refined bars are 1.72c., and common 1.60c. for large lots on deck.

Structural Material.—We continue to quote for large lots at tide-water: Beams, 15-in., 1.70c.; tees, 1.65c.; channels, 1.65c.; angles, 1.60c.

Steel Rails.—Prices remain at about \$27 for standard sections f. o. b. mills. Small rails are quoted: 12-lb., \$34; 16-lb., \$32; 20-lb., \$32; 30-lb., \$30; 40-lb. to standard, \$28, with the usual advance for small orders.

METAL MARKET.

New York, May 12, 1899.

Gold and Silver.

Gold and Silver Exports and Imports at all United States ports in March and year.

| | March. | | Year. | |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 1898. | 1899. | 1898. | 1899. |
| GOLD. | | | | |
| Exports | \$728,707 | \$1,109,845 | \$1,417,782 | \$3,765,188 |
| Imports | 30,708,320 | 3,187,575 | 43,364,415 | 14,402,561 |
| SILVER. | | | | |
| Exports | I. \$29,979,613 | I. \$2,077,730 | I. \$38,946,633 | I. \$10,637,373 |
| Imports | 4,095,963 | 5,286,607 | 12,157,754 | 15,207,703 |
| | 2,579,595 | 3,125,859 | 7,198,691 | 7,144,604 |
| Excess | E. \$1,518,368 | E. \$2,160,748 | E. \$4,969,067 | E. \$8,063,669 |

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

Gold and Silver Exports and Imports, New York

For the week ending May 11th, 1899, and for years from January 1st, 1898, 1898, 1897, 1896.

| Period | Gold. | | Silver. | | Total Excess, Exp. or Imp. |
|--------|------------|------------|------------|-----------|----------------------------|
| | Exports. | Imports. | Exports. | Imports. | |
| Week | \$212,990 | \$276,536 | \$270,885 | \$18,225 | E. \$189,104 |
| 1899. | 2,101,743 | 5,613,311 | 9,784,541 | 1,027,532 | E. 5,245,441 |
| 1898. | 1,426,939 | 64,464,897 | 13,065,963 | 1,822,063 | I. 48,594,088 |
| 1897. | 7,162,387 | 1,442,103 | 15,176,228 | 839,391 | E. 20,057,111 |
| 1896. | 21,971,216 | 16,851,490 | 14,269,925 | 800,742 | E. 18,588,509 |

The gold exports were to the West Indies; the imports were from various ports. Silver exports went chiefly to London; imports came from South America.

The United States Assay Office in New York reports the total receipts of silver at 106,000 oz. for the week.

Prices of Foreign Coins.

| | Bid. | Asked |
|----------------------------------|--------|--------|
| Mexican dollars | \$.49 | \$.51 |
| Peruvian soles and Chilean pesos | 43½ | 46 |
| Victoria sovereigns | 4.85 | 4.87 |
| Twenty francs | 3.85 | 3.88 |
| Twenty marks | 4.74 | 4.78 |
| Spanish 25 pesetas | 4.78 | 4.84 |

Average Prices of Silver per oz. Troy.

| Month. | 1899. | | 1898. | | 1897. | |
|--------------|---------------|--------------|---------------|--------------|---------------|--------------|
| | London Pence. | N. Y. Cents. | London Pence. | N. Y. Cents. | London Pence. | N. Y. Cents. |
| January... | 27.42 | 59.36 | 26.29 | 56.77 | 29.74 | 64.79 |
| February... | 27.44 | 59.42 | 25.89 | 56.07 | 29.68 | 64.67 |
| March... | 27.43 | 59.64 | 25.47 | 54.90 | 28.96 | 63.06 |
| April... | 27.65 | 60.10 | 25.95 | 56.02 | 28.36 | 61.85 |
| May... | | | 26.31 | 56.98 | 27.86 | 60.42 |
| June... | | | 27.69 | 58.61 | 27.58 | 60.10 |
| July... | | | 27.32 | 59.06 | 27.36 | 59.61 |
| August... | | | 27.48 | 59.54 | 24.93 | 54.19 |
| September... | | | 28.05 | 60.68 | 25.66 | 55.24 |
| October... | | | 27.90 | 60.42 | 26.77 | 57.57 |
| November... | | | 27.93 | 60.60 | 26.87 | 57.93 |
| December... | | | 27.45 | 59.42 | 26.83 | 58.01 |
| Year... | | | 26.76 | 58.26 | 27.55 | 59.79 |

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

Average Prices of Metals per lb., New York.

| Month. | COPPER. | | TIN. | | LEAD. | | SPELTER. | |
|------------|---------|-------|-------|-------|-------|-------|----------|-------|
| | 1899. | 1898. | 1899. | 1898. | 1899. | 1898. | 1899. | 1898. |
| Jan.... | 14.75 | 10.99 | 22.48 | 13.87 | 4.18 | 3.65 | 5.34 | 3.96 |
| Feb.... | 18.00 | 11.28 | 24.20 | 14.08 | 4.49 | 3.71 | 6.28 | 4.04 |
| March... | 17.54 | 11.98 | 23.82 | 14.38 | 4.37 | 3.62 | 6.31 | 4.25 |
| April.... | 18.43 | 12.14 | 24.98 | 14.60 | 4.31 | 3.63 | 6.67 | 4.26 |
| May.... | 12.00 | | 14.52 | | 3.64 | | 4.27 | |
| June.... | 11.89 | | 15.22 | | 3.82 | | 4.77 | |
| July.... | 11.63 | | 15.60 | | 3.95 | | 4.66 | |
| August... | 11.89 | | 16.23 | | 4.09 | | 4.58 | |
| Sept.... | 12.31 | | 16.03 | | 3.99 | | 4.67 | |
| October... | 12.41 | | 17.42 | | 3.78 | | 4.98 | |
| Nov.... | 12.80 | | 18.30 | | 3.70 | | 5.29 | |
| Dec.... | 12.93 | | 18.30 | | 3.76 | | 5.10 | |
| Year.... | 12.08 | | 15.70 | | 3.78 | | 4.57 | |

The price given in the table is for Lake Copper. The average price of electrolytic copper in January was 14.26c.; in February it was 17.02c.; in March, 16.35c.; in April, 17.13c.

Financial Notes of the Week.

The most prominent feature of the week has been the reaction and heavy decline in stocks, which is the direct result of recent inflation and high prices. There is nothing in the situation to warrant a break, except that there has been over trading in stocks and too many new issues of industrials for the market to carry much longer. Of course this fall will be followed by another upward movement. General business has not been affected to any extent by the speculative flurry.

The second and third warrants, of \$5,000,000 each, of the payment to the Spanish Government have been transferred this week. As noted last week, the transfer was made by the City Bank of New York, and no shipment of coin was made, the payment in Europe being effected by drawing on funds loaned there. The transaction has served to keep exchange strong, and another influence in the same direction has been recent heavy sales of securities held abroad, to realize the high prices which recently ruled. The New York buying of Anacosta stock from London has been quite a feature in this movement.

Silver has not maintained the high level of April's closing figures. The excitement induced by speculation has died out. Prices have, however, held up over 28d. owing to limited offerings. The East has not been a buyer.

The foreign merchandise trade of Great Britain for the three months ending March 31st is given by the Board of Trade returns as below:

| | 1898. | 1899. |
|---------|--------------|--------------|
| Imports | £119,099,209 | £118,242,584 |
| Exports | 72,817,890 | 78,294,681 |

Excess, imports..... £46,281,319 \$39,947,903
The imports decreased £856,626, or 0.7%, and the exports increased £5,476,791, or 7.5%; leaving a decrease of £6,333,416, or 15.9% in the excess of imports.

The movement of gold and silver in Great Britain for the three months is reported as follows:

| | Imports. | Exports. | Excess. |
|------|------------|------------|--------------|
| 1899 | £7,022,912 | £7,000,737 | Imp. £22,175 |
| 1898 | 9,258,841 | 10,173,480 | Exp. 914,639 |

Receipts of silver from the United States this year were £2,503,306, against £2,136,481 last year.

The Treasury Department's estimate of the money in the United States on May 1st is as follows:

| | In circulation. | In Treasury. | Totals. |
|---------------------|-----------------|---------------|---------------|
| Gold coin | \$701,077,442 | \$158,155,309 | \$859,232,751 |
| Silver dollars | 64,023,325 | 412,803,833 | 476,827,158 |
| Subsidiary silver | 69,784,194 | 6,926,631 | 76,710,825 |
| Gold certificates | 32,845,029 | 1,641,800 | 34,486,829 |
| Silver certificates | 400,379,249 | 3,647,255 | 404,026,504 |
| Treas. notes, 1890 | 33,559,041 | 953,239 | 34,512,280 |
| U. S. notes | 312,057,405 | 34,623,611 | 346,681,016 |
| Cur'y cert's | 21,265,000 | 60,000 | 21,325,000 |
| Nat'l B'k notes | 238,877,207 | 3,919,501 | 242,796,708 |

Totals \$1,933,967,892 \$622,737,179 \$2,556,605,071

The total circulation is \$25.49 per capita. The circulation shows an increase of \$6,020,950 in

Imports and Exports of Metals

| Port. | Week, May 10 | | Year, 1899. | |
|----------------------------|--------------|---------|-------------|--------|
| | Expts. | Impts. | Expts. | Impts. |
| *New York. | | | | |
| Aluminum.....long tons | 25 | | 239 | 10 |
| Antimony ore..... | | 110 | | 558 |
| regulus..... | | 165 | | 427 |
| oxide..... | | | | 11 |
| Chrome ore..... | | | | 620 |
| Copper, fine..... | 1032 | 626 | 18,784 | 5,202 |
| matte, ore..... | 2 | | 540 | 133 |
| ash..... | | 41 | | 88 |
| sulphate..... | 93 | | 9,638 | 30 |
| other..... | | | | 6 |
| Ferro-chrome..... | | 46 | | 51 |
| Ferro-mangan'se..... | | | | 51 |
| Ferro-silicon..... | | | | 51 |
| Iron ore..... | | 150 | 5 | 50 |
| pig, bar, rod..... | 202 | | 2,208 | 585 |
| pipe..... | 946 | | 12,727 | |
| plates, sheets..... | | | 251 | |
| other..... | 14 | | 917 | |
| Lead..... | 425 | 1,224 | 20,928 | 17,678 |
| ore..... | | | | 1,497 |
| Manganese, ore..... | | | | 914 |
| Metals, old scrap..... | 34 | 361 | 2,326 | |
| Composition..... | 105 | | 2,435 | |
| Nails..... | 306 | | 6,477 | |
| Nickel..... | 100 | | 759 | |
| Rail'd material..... | 55 | 173 | | 1,383 |
| Rails, old..... | | | 6,675 | |
| Spiegeleisen..... | | | | 212 |
| Steel bars, plates..... | 905 | 1702 | 22,445 | 6,073 |
| rails..... | 2,532 | 1100 | 27,525 | 100 |
| hoops..... | | | 446 | |
| wire..... | 1,087 | | 12,957 | 34 |
| not spec'd..... | 103 | 165 | 5,108 | 975 |
| Tin..... | | | | 10,820 |
| dross or ashes..... | 3 | | 60 | |
| and black plates..... | | 1101 | | 11,218 |
| Zinc..... | | 75 | 265 | 148 |
| ashes, skim..... | 117 | | 485 | |
| ore..... | 87 | 115 | 1,117 | 65 |
| oxide..... | 53 | 125 | 1,760 | 214 |
| †Baltimore. | | | | |
| Alumina.....bags | | 1,900 | | 3,479 |
| Antimony regulus.....casks | | | | 42 |
| Chrome ore.....long tons | | | 13,645 | |
| Copper, fine..... | 189 | | | |
| matte..... | | | 1,231 | |
| pipe..... | | | 100 | |
| Ferro-manganese..... | | 60 | | 1,284 |
| Ferro-silicon..... | | | 184 | |
| Iron pig, bar, etc..... | | | 22 | 3,258 |
| ore..... | | 2,805 | | 30,357 |
| pipe..... | | 189 | | 1,618 |
| pyrites..... | | 3,133 | | 18,916 |
| other..... | | 11 | | 637 |
| Lead..... | | | | 15 |
| Manganese ore..... | | 1 | | 18,799 |
| Metals, scrap..... | | | 3,578 | 14 |
| Nails..... | | | 319 | |
| Spiegeleisen..... | | 128 | | 843 |
| Steel bars, pipes..... | | 667 | | 18,976 |
| rails..... | | 18 | | 446 |
| pipe..... | | 1,561 | | 18,646 |
| not specified..... | | | | 573 |
| Tin..... | | | | 1,678 |
| dross..... | | | | 512 |
| and blackplates..... | | 109 | | 539 |
| Zinc..... | | | | 18 |
| dross..... | | | | 152 |
| skimmings..... | | | | 131 |
| oxide..... | | 1 | | 1 |
| *Philadelphia. | | | | |
| Antimony.....casks | | | | 320 |
| Chrome ore.....long tons | | | | 17,239 |
| Copper ore..... | | | | 617 |
| Ferro-manganese..... | | | | 150 |
| Iron, pig..... | | 1150 | | 49,337 |
| ore..... | | 110,335 | | 23,708 |
| pyrites..... | | | | 826 |
| Manganese ore..... | | | | |
| Spiegeleisen..... | | | | |
| Steel..... | | | | |
| Tin..... | | | | 495 |
| and black plates..... | | | | 181 |
| Zinc dust..... | | 110 | | 10 |
| ore..... | | | | 3,083 |
| *Galveston. | | | | |
| Lead.....long tons | | | 652 | |
| Zinc..... | | | 1,170 | |
| *Boston. | | | | |
| Tin.....long tons | | | | |

April, and an increase of \$127,106,450 as compared with May 1st, 1898.

The coinage at the Mints of the United States in April and the four months ending April 30th, is reported as below by the Bureau of the Mint:

| Denom. | April. | | Four months. | |
|----------------------------|------------------|---------------------|-------------------|------------------------|
| | Pieces. | Value. | Pieces. | Value. |
| Double Eagles. | 231,220 | \$4,624,400 | 2,144,323 | \$42,886,460.00 |
| Eagles | ..... | ..... | 51,524 | 515,240.00 |
| Half eagles | 654,015 | 3,270,075 | 1,910,039 | 9,550,195.00 |
| Quart. eagles | ..... | ..... | 38 | 95.00 |
| Total gold | 885,235 | \$7,894,475 | 4,105,924 | \$52,951,990.00 |
| Dollars | 1,634,000 | 1,634,000 | 6,582,301 | 6,582,301.00 |
| Half dollars | 500,000 | 250,000 | 1,020,301 | 510,150.50 |
| Quart. dollars | 504,000 | 126,000 | 1,708,301 | 427,075.25 |
| Dimes | 1,494,490 | 149,449 | 2,264,791 | 226,479.10 |
| Total silver | 4,132,490 | \$2,159,449 | 11,575,694 | \$7,746,005.85 |
| 5c. nickels | ..... | ..... | 1,606,686 | 80,334.30 |
| 1c. bronze | 1,307,000 | 13,070 | 4,699,686 | 46,996.86 |
| Total minor | 1,307,000 | \$13,070 | 6,306,372 | \$127,331.16 |
| Total coinage | 6,324,725 | \$10,066,994 | 21,987,990 | \$60,825,327.01 |

A comparison with March shows a falling off in the April coinage of \$4,505,078, of which \$4,282,240 was in gold. The coinage in April was the smallest this year.

The statement of the United States Treasury on Thursday, May 10th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date of last week:

| | May 3. | May 10. | Changes. |
|---------------------|----------------------|----------------------|-----------------------|
| Gold | \$246,421,721 | \$241,699,762 | D. \$4,721,959 |
| Silver | 4,712,290 | 5,172,925 | I. 460,635 |
| Legal tenders | 12,647,000 | 13,084,090 | I. 437,090 |
| Treas. notes, etc. | 773,044 | 812,023 | I. 38,979 |
| Totals | \$264,554,055 | \$260,768,800 | D. \$3,785,255 |

Treasury deposits with national banks amounted to \$84,499,949, a decrease of \$814,164 during the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending May 6th, gives the following totals, comparison being made with the corresponding weeks in 1898 and 1897:

| | 1897. | 1898. | 1899. |
|---------------------------------|----------------------|----------------------|----------------------|
| Loans and discounts | \$504,920,100 | \$571,085,200 | \$776,702,800 |
| Deposits | 570,361,300 | 659,616,900 | 839,625,400 |
| Circulation | 14,672,300 | 14,598,600 | 13,883,200 |
| Reserve: | | | |
| Specie | 87,570,700 | 159,791,500 | 188,438,700 |
| Legal tenders | 99,115,600 | 49,029,200 | 55,819,600 |
| Total reserve | \$186,686,300 | \$208,820,700 | \$244,258,300 |
| Legal requirements | 142,590,325 | 164,904,225 | 224,906,350 |
| Balance, surplus | \$44,095,975 | \$43,916,475 | \$19,351,950 |

Changes for the week this year were increases of \$16,664,400 in loans and discounts, and \$16,030,100 in deposits; decreases were \$73,500 in circulation, \$729,700 in specie, \$1,435,500 in legal tenders, and \$6,172,725 in surplus reserve.

Shipments of silver from London to the East for the week ending April 27th, 1899, are reported by Messrs. Pixley & Abell's circular as follows:

| | 1898. | 1899. | Changes. |
|---------------------|-------------------|-------------------|--------------------|
| India | £2,441,040 | £1,468,300 | D. £972,740 |
| China | 285,166 | 475,338 | I. 190,172 |
| The Straits | 96,462 | 24,907 | D. 71,555 |
| Totals | £2,822,668 | £1,968,545 | D. £854,123 |

Arrivals for the week, this year were £114,000 in bar silver from New York and £9,000 from the West Indies; total, £123,000. Shipments were £45,000 in bar silver to Bombay, £43,000 to Shanghai, and £22,708 to Hong Kong; total, £110,708.

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

| Banks. | —1898.— | | —1899.— | |
|-------------|---------------|---------------|---------------|---------------|
| | Gold. | Silver. | Gold. | Silver. |
| N. Y. As'n. | \$159,791,500 | ..... | \$188,438,700 | ..... |
| England | 168,563,585 | ..... | 152,090,540 | ..... |
| France | 372,254,075 | \$243,665,335 | 364,444,360 | \$241,184,375 |
| Germany | 141,065,000 | 72,670,000 | 144,130,000 | 74,250,000 |
| Aus.-Hun. | 178,065,000 | 62,650,000 | 180,250,000 | 62,975,000 |
| Spain | 49,170,000 | 35,660,000 | 58,270,000 | 63,640,000 |
| Belgium | 14,220,000 | 7,110,000 | 14,810,000 | 7,405,000 |
| Neth'l'nds | 14,250,000 | 34,670,000 | 19,170,000 | 34,270,000 |
| Italy | 76,655,000 | 9,225,000 | 77,005,000 | 13,790,000 |
| Russia | 559,775,000 | 20,525,000 | 485,615,000 | 25,115,000 |

The returns for the Associated Banks of New York are of date May 6th, and the others are of date May 4th, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

Indian exchange has been somewhat stronger, partly owing to a larger demand from the Indian banks, and partly to transfers of rupee paper to London. The Council bills offered in London were taken at 16d. per rupee.

Other Metals.

Daily Prices of Metal in New York.

| May. | Sterling Exchange. | Silver. | | Copper. | | | Tin, cts. lb. | Lead, cts. lb. | Spelter, cts. lb. |
|------|--------------------|---------------|----------------|----------------|---------------------|-----------------------------|---------------|----------------|-------------------|
| | | Fine oz. Cts. | Lon-don, Pence | Lake, cts. lb. | Elec-tro-lytic, lb. | Lon-don stand-ard, lb. ton. | | | |
| 6 | 4.87½ | 61½ | 28 | 18 | 17¼ | ..... | 25¼ | 4.47½ | 6.85 |
| 8 | 4.87½ | 61½ | 28 | 18½ | 17½ | 76 12 6 | 25¼ | 4.47½ | 6.90 |
| 9 | 4.87½ | 61½ | 28 | 18 | 17¼ | 76 10 0 | 25¼ | 4.45 | 6.85 |
| 10 | 4.87½ | 61½ | 28 | 18½ | 17½ | 76 10 0 | 25¼ | 4.47½ | 6.90 |
| 11 | 4.87 | 61½ | 28 | 18 | 17 | 76 12 6 | 25¼ | 4.45 | 6.85 |
| 12 | 4.87 | 60½ | 28 | 18½ | 17½ | 77 5 0 | 25¼ | 4.47½ | 6.90 |

Copper.—The market has been fairly firm, but at the same time very inactive. Very little business has been transacted. Manufacturers, though unusually busy, have concluded to await further developments before making additional purchases, while producers have enough orders on their books to prevent their worrying over the immediate future. The only change of importance during the week has been a disposition to meet buyers for Lake at a somewhat lower price than that ruling during the preceding few weeks, when this kind in particular was extremely scarce and commanded a premium considerably higher than that usually ruling as compared with other kinds. We quote: Lake, 18@18½c.; electrolytic in cakes, bars or ingots, 17@17½c.; electrolytic cathodes, 16½@17c., and casting copper, 17c.

The London market has been bare of any interesting feature. The quotations for standard copper have fluctuated up from £76 and the closing price to-day being £77 5s. for spot, and 5s. higher for three months.

Refined and manufactured we quote: English tough, £79@£79 10s.; best selected, £79 10s.@£80; strong sheets, £85; India sheets, £83; yellow metal, 6½d.

Tin has experienced a further decline from the highest prices recently reached, the quotation having receded to 25¼c. for spot, with future entirely neglected. The happenings at this end have been merely a reflection of the events in the London market, where the metal last week closed at £117 10s., declining since to £115 17s. 6d., closing to-day at £116 5s. for spot, and £117 for three months.

Lead.—The improved condition continues to prevail, but prices have not advanced any further, the quotation being 4.45c.

Spanish lead has changed for the better, the price now being £14 5s.@£14 6s. 3d., while for English it is £14 7s. 6d.@£14 10s.

Imports of lead in ores and base bullion into the United States in March are reported by the Treasury Department at 24,419,135 lbs., making a total for the first quarter of this year of 58,164,086 lbs., against 54,925,190 lbs., in the corresponding period last year. Exports of lead refined here in bond in March, 1899, amounted to 15,412,919 lbs., making a total of 43,244,138 lbs. since January 1st, as against 43,110,860 lbs. in the same time last year. There were also imported in March, 1899, lead in pigs, ears and scrap, amounting to 7,009 lbs., against nothing in March, 1898.

St. Louis Lead Market.—The John Wahl Commission telegraphs us as follows: The lead market is quite firm. Sales of chemical hard lead in round lots have been made at 4.35c. Corroding lead is worth 4.35@4.37½c. here.

Spelter is unchanged at about 6.85@6.90c. at New York and 6.60@6.65c. at St. Louis.

Neither is there any change in the foreign market, where the quotations remain unaltered at £28 10s. for ordinary brands and £28 15s. for specials.

Exports of zinc ore from the United States in March amounted to 4,109 long tons, making a total for the three months of this year of 7,107 tons, against 2,674 tons in the corresponding period of 1898. Exports of manufactured zinc or spelter for the first quarter of 1899 amounted to 9,373,597 lbs., as compared with 10,379,191 lbs. last year.

Antimony continues in good demand, but prices are unchanged at 10½c. for Cookson's; 10c. for Hallett's, "C," U. S. Star and Hungarian.

Nickel continues on unchanged lines, and no alteration in prices can be reported. We quote for ton lots, 33@36c. per lb., and for smaller orders 35½@38c. London prices are 14@16d. per lb., according to size and order.

Quicksilver.—The New York quotation remains \$42 per flask. The London price has been advanced again to £8 2s. 6d. per flask, with the same figure quoted from second hands.

The Minor Metals.—Quotations are given below for New York delivery:

| | Per lb. | Per lb. |
|--------------------|--------------|----------------------------|
| No. 1, 99% ingots. | 35@37c. | Bismuth .....\$1.15@1.50 |
| No. 2, 90% ingots. | 31@34c. | Magnesium .....\$2.75@3.00 |
| Rolled sheets |38c. | up Phosphorus .....48@50c. |
| Alum.-bronze |20@23c. | Tungsten .....70c. |
| Nickel-alum. |33@39c. | Ferro-tungsten, 60% 60c. |

Variations in price depend chiefly on the size of the order.

LATE NEWS.

According to advices from Knoxville, Tenn., an option has been executed on nearly 3,000 acres of East Tennessee zinc mining property, and the zinc plant at Clinton, Tenn. The option is given by the Edes, Mixer & Heald Zinc Company to John Weir, of New York. It gives Mr. Weir the privilege of purchasing the property in 12 months for \$190,000. The zinc works at Clinton have been closed for a considerable time, and repeated efforts have been made by the owners to revive the operation of the works, but to no avail. It is understood that Mr. Weir proposes to improve the works and make the mines accessible, so that the ores can be mined and shipped to the works with less expense incurred. The mining lands upon which Mr. Weir has options are: Mossy Creek mines, Jefferson County, 450 acres; Mills Farm mines, Jefferson County, 110 acres; Roseberry mines, Jefferson County, 300 acres; Flat Creek mines, Knox County, 12 acres; Lead Mine Bend mines, Union County, 130 acres; Knott Farm Mines, Union County, 175 acres; Eill Steiner farm, Union County, 80 acres; Peter Steiner farm, Union County, 80 acres; Kate Meyer farm, Union County, 700 acres; Bealer farm mines, Union County, 200 acres; Croft mines, Knox County, 450 acres. These will be sold outright to Mr. Weir. In addition thereto he will purchase the zinc works plant, at Clinton, which covers an area of five acres all together. All the buildings, machinery and territory adjacent to the plant, will go to the new owner if the option is taken up. There is also included in the option, a lease on the Straight Creek mines in Claiborne County. These mines cover 200 acres. This lease is at 25c. per ton royalty and dates from 1890, having 90 years yet to run. Mr. Weir is to pay for this property, if he enforces the option, four installments of \$6,250 each, and three installments of \$55,000 each. The last payment to be made November 26th, 1901. The gentlemen who are interested in the present company, which is seeking to dispose of this valuable property, are from Massachusetts. They are Edwin L. Edes and Jason W. Mixer, of Plymouth, Mass., and Charles W. Mixer.

At a meeting held in New York, May 11th, the organization of the Republic Iron and Steel Company was completed, and officers elected as follows: President, Randolph S. Warner; first vice-president, George D. Wick; second vice-president, Samuel Thomas; third vice-president, James C. Corns; fourth vice-president, George M. Bard; secretary, Silas J. Llewellyn; treasurer, John F. Taylor; general counsel, Harry Rubens; executive committee, Myron C. Wick; Alexis W. Thompson, John F. Taylor, T. A. Meysenburg, Randolph S. Warner, G. Watson French, George D. Wick, Harry Rubens, S. J. Llewellyn; directors, August Belmont, Myron C. Wick, Grant B. Schley, R. S. Warner, George R. Sheldon, J. G. Caldwell, G. W. French, A. W. Thompson, George D. Wick, J. F. Taylor, Harry Rubens, T. A. Meysenburg, L. E. Cochran, James C. Corns, H. W. Hassinger, P. L. Kimberly, George M. Bard, George M. Clark, Samuel Thomas, S. J. Llewellyn. The company is capitalized at \$55,000,000, which includes \$25,000,000 7% cumulative preferred stock and \$30,000,000 common stock. It starts out with a cash working capital of \$6,500,000, and with no indebtedness or fixed charges by way of mortgage, the different properties absorbed being taken over free of incumbrances. At present there are 36 concerns in the company, as follows: Andrews Brothers Company, Brown Bonnell Iron Company, and Mahoning Valley Iron Company, Youngstown, O.; Cherry Valley Iron Works, Leetonia, O.; Atlantic Iron and Steel Company, New Castle, Pa.; Lake Erie Iron Company, Cleveland, O.; Corns Iron and Steel Company, Massillon, O.; Toledo Rolling Mill Company, Toledo, O.; Mitchell, Tranter & Co., Incorporated, Cincinnati, O.; Eagle Iron and Steel Company, Ironton, O.; Indiana Iron Company and Muncie Iron and Steel Company, Muncie, Ind.; Kansas City Nut and Bolt Company, Kansas City, Mo.; Peoria Iron and Steel Company, Peoria, Ill.; White River Mills, Muncie, Ind.; Williams Mill, Muscatine, Ia.; Union Steel Company, Alexandria, Ind.; Marion Steel and Iron Company and Westerman-Stewart Iron Company, Marion, Ind.; Wetherald Rolling Mill Company, Frankton, Ind.; Indiana Forge and Rolling Mill Company, New Albany, Ind.; Central Iron and Steel Company, Brazil, Ind.; Wabash Iron Company and Terre Haute Iron and Steel Company, Terre Haute, Ind.; Tudor Iron Works, St. Louis; Springfield Iron Company, Springfield, Ill.; Inland Iron and Forge Company, Chicago; Sylvan Steel Company, Moline, Ill.; Minnesota Iron and Steel Company, Minneapolis, Minn.; Birmingham Rolling Mill Company and Alabama Rolling Mill Company, Birmingham, Ala.; Cambria Mining Company and Lillie Mining Company, Michigan; Franklin Iron Mining Company, Mesabi Range; Pioneer Mining and Manufacturing Company, Birmingham, Ala.; Connellsville Coke Company and Croton Lime Company, New Castle, Pa. The headquarters will be in the Stock Exchange Building, Chicago, with a branch office in New York.

MINING STOCKS.

Complete quotations will be found on pages 578, 579 and 580 of mining stocks listed and dealt in at:

| | | |
|----------------|----------------|------------|
| Baltimore. | New York | Mexico. |
| Boston. | Philadelphia. | Paris. |
| Butte. | St. Louis. | Rossland. |
| Cleveland. | Salt Lake. | Shanghai. |
| Colo. Springs. | San Francisco. | Toronto. |
| Denver. | London. | Valparaiso |
| Spokane. | | |

New York. May 12.

The higher priced stocks have attracted most attention, but prices are lower in sympathy with the general market.

Anaconda Copper, of Montana, lost heavily since last week, and on May 8th, 26,900 shares were sold at \$54½@56¼; thereafter sales were reported at \$53@55½.

The securities of the American Smelting and Refining Company show a falling off in value. Common sold down to \$39@41¼ on May 9th on transactions of 6,410 shares, and the preferred \$82@84. At the close prices are firmer.

On the curb much activity prevailed, particularly in Amalgamated Copper, which was bought in lots of 1,000 shares and over by brokers said to be identified with the company. On May 5th \$108 was quoted; on May 8th at \$99@102, and at close, sales are reported at \$100@100¼. No subscriber is to be allowed over 20% of the amount of his subscription. British Columbia Copper is lower, at \$12½@13½, which is a fraction under dealings on the Boston Exchange. Flemington Coal and Coke sold on May 8th at \$27½, as an electric plant is to be constructed, which, it is said, will reduce the cost of mining about 10c. per ton, and increase the output of coal. On May 9th the stock declined to \$26@26½, but soon recovered to \$26¾. Tennessee Copper sagged from \$25½@26½ on May 5th to \$20½@23 on May 9th, but closes stronger, around \$24.

In the Colorado group the Cripple Creek shares were generally steady, and the Leadvilles firmer in price. The Californians were well maintained, and especially Standard Consolidated rose to \$2.70. This company will pay a 10c. dividend May 24th. The Comstocks ruled lower in consequence of new assessments. Ontario, of Utah, brought \$8, and Horn Silver, \$1.75.

At the annual election of the New York Stock Exchange on May 8th, the following officers were chosen: President, Rudolph Keppler; secretary, George W. Ely; treasurer, Franklin W. Gilley; chairman, William McClure; members of the governing committee to serve four years—Walter A. Bass, George H. Bend, Charles S. Bryan, Clarence S. Bryan, W. M. Donald, J. B. Dumont, Ernest Groesbeck, Henry C. Lawrence, and A. Clifford Tower. Members of the governing committee to serve three years—George B. Post, Jr., to serve one year, and F. C. De Veau. Trustee of the gratuity fund to serve five years—William L. Bull; to serve four years—Francis L. Eames. Nominating committee for 1900—Walter Bowne, H. I. Judson, A. P. Kelley, W. B. Sancton and D. B. Van Emburgh.

New listings on the Stock Exchange were \$282,000 additional general mortgage 5% sinking fund gold bonds of 1943, Nos. 2,022 to 2,303, inclusive, of the Colorado Fuel and Iron Company, making the total amount listed to date \$2,303,000, Nos. 1 to 2,303, inclusive.

Auction sales were 213 shares of New Jersey Zinc Company at \$57¼.

The Boston-Duenweg Zinc Company has declared a monthly dividend of 1%, payable May 16th, and the Lehigh Coal and Navigation Company a semi-annual dividend of 2%, payable May 27th.

Boston. May 11.

(From Our Special Correspondent.)

The week has shown a strong downward reaction in copper stocks, which has carried many operators off their feet, and wiped out a good many expected profits. Falls of \$35 in Calumet and Hecla, \$38 in Boston & Montana, \$11 in Butte & Boston, \$10 in Isle Royale, and \$9 in Arcadian are typical of the market. Since April 25th there has been a decline of over \$35,000,000 in the nominal value of our copper stocks. The decline has also put back a number of new flotations—which is not an unmixed evil.

The heavy over subscription of Amalgamated was expected. The allotments have not yet been completed. The subscriptions have suffered in the general decline, dropping from \$120 to about \$99.

The market increased materially in activity on Wednesday, and held well as a whole. Good buying orders came in, particularly in good dividend-paying stocks. Mining shares, while heavy, were much less prominent than earlier in the week. Calumet & Hecla sold at \$810; Montana, \$348; Tamarack, \$220; Butte, \$88; Quincy, \$160; Osceola, \$85; Arcadian, \$58; Old Dominion, \$39½; Parrot, \$56½; Utah, \$40; Isle Royale, \$56; Franklin, \$22½; Amalgamated, \$99½ bid; Tecumseh, \$5½; Santa Fe, \$13¼; Union, \$74½; Old Colony, \$12½; Mohawk, \$31; Mass., \$12½; Merced, \$6½; United States, \$20; British Columbia, \$14; Copper Range, \$40¼

Cochiti, \$13; Centennial, \$34; Ysabel, \$12; Winona, \$14; Wolverine, \$44½; Rhode Island, \$10; Wyandotte, \$7½; Trimountain, \$9½; Adventure, \$11½; Allouez, \$9½; Arnold, \$8; Atlantic, \$30; Baltic, \$27½; Pioneer, \$2½; Bingham, \$10½; Washington, \$2½.

The stock of the Le Grande Copper Company of Arizona has been underwritten through Herbert B. Church & Company. The details available concerning this property are too indefinite to make it tempting to investors. If it is to be sold, we ought to know more about it.

The latest flotation on the Boston market is the Helvetia Copper Company. The property consists of claims in the Santa Rita Mountains in Arizona. The company is a New Jersey organization, with \$5,000,000 stock in 200,000 shares of \$25 each. Some Detroit people are interested, and Paine, Webber & Co., in Boston, are doing the preliminary floating.

Salt Lake City. May 6.

(From Our Special Correspondent.)

Lethargy rules in Utah mining shares. The late spring and a decline in the silver quotation—following the sudden advance—are weakening influences.

Ajax grows stronger, with generous buying. The Newhouse-Weir regime added to the worth of the property, make it a prime favorite. Bullion Beck is stationary. The May dividend is assured. The same is true of Centennial-Eureka. Eagle and Blue Bell did business at \$1.75, and its champions continue enthusiastic. Grand Central sold to-day just below \$8. The regular \$37,500 dividend is announced for the 10th. Homestake remains strong. The annual meeting occurs Monday next, when there will be noteworthy changes. Mammoth is moving up. Star Consolidated softened below \$1, and later recovered part of the loss. Swansea is a little weaker than last Saturday, while South Swansea is higher and firmer.

Chloride Point closed 88 bid, 97 asked. Daisy is 2 points under last week. Contradictory reports of the property are in the air, one of the most persistent being of improved results from the mill. Geyser-Marion is about stationary. Mercur has softened a little over the non-payment of the May dividend. There are Eastern orders for the stock at \$7. Little Pittsburg is weaker. Northern Light is active and firm. Sacramento is as firm as a week ago. Sunshine is once more a puzzle.

Alice is in some demand. Dalton & Lark is stronger. Keen interest is taken in the work on foot at the mines under the option. Dexter holds its own. Horn Silver retains the last advance, with inquiry for the shares.

Park City mines are just emerging from the hardest winter blockade in the annals of the camp, and with a resumption of shipments the shares will probably look up. Daly closed \$1.43½ bid, \$1.57 asked. Ontario closed firm, \$8 bid, \$10 asked. Silver King, unchanged. The regular \$50,000 dividend is declared, payable May 10th, though no ore was marketed in April. Valeo closed \$1.05 bid, \$1.10 asked. A 5c. assessment is just levied.

San Francisco. May 6.

(From Our Special Correspondent.)

The receipts of coal at San Francisco in April by sea amounted to 94,389 tons, an increase of 2,205 tons, or 2.4%, over April of last year. No Eastern nor British coal arrived during the month, and only two cargoes of Australian. The rest was made up by Puget Sound and British Columbia coals.

The receipts for the four months ending April 30th were: Eastern, anthracite and Cumberland, 13,186; Washington, 219,021; Oregon, 19,110; British Columbia, 138,529; Australia, 44,200; Great Britain, 29,971; total, 464,017 tons. This is an increase of 24,970 tons, or 5.7% over last year.

Light business and a dull market early in the week were followed later by a general break in prices. The business was all inside, however, and the general public continues to let stocks alone with great perseverance.

The despatches and returns from the Comstock pumping show nothing new, and little can be expected for some time yet.

Some quotations noted are: Consolidated California & Virginia, \$1.70; Ophir, \$1.25; Sierra Nevada, 96c.; Mexican, 53c.; Yellow Jacket, 45c.; Gould & Curry, 36c.; Hale & Norcross, 26c. For Standard Consolidated—which has declared a dividend of 10c. a share, payable May 24th—\$2.80 was bid.

The sales on regular call at the San Francisco Stock Exchange for the year to date compare as follows:

| | | |
|----------------------|---------|---------|
| | 1898. | 1899. |
| January, shares..... | 157,369 | 121,955 |
| February | 151,065 | 350,800 |
| March | 166,260 | 272,625 |
| April | 203,355 | 209,215 |
| Total | 678,049 | 954,595 |

The increase this year was all made in February and March, when trading was quite active.

At the convention of representative miners of Southern California, held in Los Angeles on April 29th, a Southern branch of the California Miners' Association was successfully organized, with a large membership and the following officers: President, Stephen M. White; vice-president, Captain Mullens; secretary, Oscar Brees; treasurer, H. J. Fleishman. This adds to the strength of the California Miners' Association, the branches of which now cover the entire State.

London. April 29.

(From Our Special Correspondent.)

On several occasions I have referred to the companies promoted in London by Mr. J. Morris Cotton to work Canadian and Klondike schemes of various sorts and my criticisms have always been the reverse of laudatory. Another proof of the undesirability of investing in his companies is to be found in the first report of the Klondike & Columbian Gold-fields, Limited, which was floated by him in August, 1897. The balance sheet shows expenses of directors' fees, office rent, etc., in London, of £2,550, and in British Columbia of £3,200; there are losses of £7,000 on the working of steamers and other ventures, and a profit of £2,300 on the wharf business, while £1,500 is the proportionate amount of preliminary expenses charged to the first year of working. Then comes the remarkable item on the profit side of the account "By appreciation in value of investments and mining properties, £48,466." What this item really means no one but Mr. Cotton knows, but it is obviously absurd to include hypothetical profits in a balance sheet. The result of this inclusion is that an apparent profit of £39,000 figures in the statement, instead of an actual loss of £9,700. It must also be mentioned that an interim dividend at the rate of 2s. per share was paid in December, 1897, presumably with the intention of creating a demand for the shares. In view of the actual loss as shown in the balance sheet, this interim dividend was paid out of capital. The report which accompanies this balance sheet says that overtures have been made to the Dawson City, Klondike & Dominion Trading Company, Limited, and the Rainy River & Ontario Exploration Company, Limited, with a view of amalgamation with the Klondike & Columbia Gold-fields, and that these companies have agreed. Seeing that these two companies were also promoted by Cotton, are located in the same office with the same chairman (Cotton), secretary, solicitors and bankers, this talk about overtures seems nonsense. To carry out the amalgamation it is proposed to issue £20,000 in debentures. I do not think the public should supply Mr. Morris Cotton with any more money to play with.

Preparations are being made on a magnificent scale for the approaching flotation of the Independence Mine at Cripple Creek on the London market. This mine is of course well known in America, and Mr. T. A. Rickard has very thoroughly examined and reported on it. The Venture Corporation, Limited, has the matter in hand here, and very thoroughly are they advertising it by puffs preliminary. I have no details yet as to the capitalization, purchase price, etc.; in fact, they are not yet settled, except that the capital stock is to be £1,100,000.

The mining market in general this week has been chiefly occupied with West Australian shares, Chartered, and Copper Mining shares. Chartered shares have been a strong market in view of the meeting of the company to hear Mr. Cecil Rhodes, and the price has been moved up to £4. It seems probable to me that another issue of debentures will be made so as to provide funds for subscribing to Mr. Rhodes' railway schemes, but as usual Mr. Rhodes' sphinx-like demeanor offers little opportunity of judging his intentions. The copper market has had great effect on the shares in copper producing companies. A great deal of mysterious talk is indulged in about the proposed copper combine in America. None of the English companies know anything of the combine, but as long as such action keeps up the price of the metal they are highly interested spectators.

A new copper company has been advertised this week, the Colonial Copper Corporation, Limited, capital £125,000, to acquire the Cow Flat copper property near Georges Plains in the Bathurst District, New South Wales. This property is in the midst of a fairly extensive mineralized district, and there is considerable showing of oxides and carbonates. Surface work has been done on tribute for some time, and with satisfactory results. Mr. G. H. Slayton and Mr. W. T. Opie have examined the property and consider it well worth opening up on a large scale. There are three directors, Mr. Brigstock, a stock broker; Messrs. George Hardie and John M. Stobart. The latter two gentlemen are co-directors with Mr. G. H. Slayton on two other Australasian companies, so Mr. Slayton's report as a mining engineer can hardly be called an independent one. Mr. Opie's report is quite an off-hand one and is of no particular value. Mr. Hardie and Mr. Stobart are directors of other companies which can hardly be called successes. So I can only hope that in the present case the performance will be equal to the promise.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing company names, locations, par values, and prices for various dates from May 5 to May 11.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing company names, locations, par values, and prices for various dates from May 4 to May 10.

*Official quotations Boston Stock Exchange. Total sales, 199,406 * Ex-Dividend.

CLEVELAND, O.

Table of stock quotations for Cleveland, O., listing company names, iron ranges, par values, and prices for May 11.

BUTTE, MONT.

Table of stock quotations for Butte, Mont., listing company names, locations, par values, and prices for April 30.

COLORADO SPRINGS COLO.

Table of stock quotations for Colorado Springs, Colo., listing company names, locations, par values, and prices for May 1 to May 6.

* Official quotations Colo. Springs Mining Stock Exchange. Sales: Listed stocks, 1,611,425 shares; unlisted, 1,450,925 shares; total, 3,062,350 shares; cash value, \$170,957.70

By Telegraph.

Table of stock quotations received by telegraph, listing company names, locations, par values, and prices for May 6 to May 10.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing company names, locations, par values, and prices for various dates.

PHILADELPHIA PA.

Table of stock quotations for Philadelphia, Pa., listing company names, locations, par values, and prices for May 4 to May 10.

BALTIMORE, MD.

Table of stock quotations for Baltimore, Md., listing company names, locations, par values, and prices for May 11.

ST. LOUIS, MO.

Table of stock quotations for St. Louis, Mo., listing company names, locations, par values, and prices for May 10.

STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colorado, listing various mining and industrial companies with their share prices and sales figures for May 1st through May 6th.

Official Quotations Denver Stock Exchange. Sales: Mines, 86,891 shares; Prospects, including those mentioned, 25,500 shares; Miscellaneous, 159,000 shares; total, 270,390 shares.

SALT LAKE CITY, UTAH.

Table of stock quotations for Salt Lake City, Utah, listing various mining companies with their share prices and sales figures for May 6th.

*From Our Special Correspondent. †Utah companies. ‡Mines in Vanderbilt, Cal. Mines in Tuscarora, Nev.

SPOKANE WASH.

Table of stock quotations for Spokane, Washington, listing various mining companies with their share prices and sales figures for May 3rd.

†Telegraphic quotations of the British-Canadian Investment and Mining Syndicate. *Under Republic management.

TORONTO, CAN.

Table of stock quotations for Toronto, Canada, listing various mining and industrial companies with their share prices and sales figures for May 3rd through May 9th.

* Official quotations of the Toronto Mining and Industrial Exchange. Total shares sold, 169,950.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, California, listing various mining and industrial companies with their share prices and sales figures for May 1st through May 11th.

Official telegraphic quotations of San Francisco Stock Exchange

ROSSLAND, BRITISH COLUMBIA.

Table of stock quotations for Rossland, British Columbia, listing various mining companies with their share prices and sales figures for May 4th.

* From Our Special Correspondent.

VALPARAISO, CHILE.

Table of stock quotations for Valparaiso, Chile, listing various mining companies with their share prices and sales figures for Mar. 25th.

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

MEXICO.

Table of stock quotations for Mexico, listing various mining companies with their share prices and sales figures for May 4th.

NOTE.—In most of the older Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Many newer companies have a nominal par value, usually \$50 or \$100. Prices are in Mexican dollars.

SHANGHAI, CHINA.

Table of stock quotations for Shanghai, China, listing various mining companies with their share prices and sales figures for April 3rd.

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

STOCK QUOTATIONS.

Table with columns: LONDON, April 28. NAME OF COMPANY, Country, Authorised capital, Par value, Last dividend, Quotations. Lists various mining companies like Alaska-Mexican, Alaska-Treadwell, etc.

Table with columns: PARIS, April 18. NAME OF COMPANY, Country, Product, Capital Stock, Par value, Latest div., Prices. Lists companies like Acieries de Creusot, Firminy, etc.

MEETINGS.

Table with columns: NAME OF COMPANY, Location, Meeting, Date, Place of Meeting. Lists meetings for companies like Alamo, Anacoada, etc.

DIVIDENDS.

Table with columns: NAME OF COMPANY, Current dividends, Paid since Jan. 1, 1899, Total to date, NAME OF COMPANY, Current dividends, Paid since Jan. 1, 1899, Total to date. Lists dividends for companies like Alamo, Anacoada, etc.

ASSESSMENTS.

Table with columns: NAME OF COMPANY, Location, No., Delinq., Sale, Amt. Lists assessments for companies like Andes, Bullion, etc.

*New Assessment.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

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

G. Gold, S. Silver, L. Lead, C. Copper, B. Borax. * Non-assessable.

Note.—This table is corrected up to May 10. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to May 1st. Readers of THE ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Review of Chemicals and Minerals.

Table with multiple columns listing various chemical and mineral products such as Abrasives, Calcium, Cement, Glycerine, Chlorine, Chrome Ore, Acids, Copper, Iron, Lead, Zinc, Potassium, and various salts. Each entry includes a description, quantity, and price.

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

Table listing rare elements and their compounds, including Barium, Beryllium, Boron, Calcium, Cerium, Chromium, Cobalt, Europium, Gallium, Germanium, Glucinum, Indium, Iridium, Lanthanum, Lithium, Molybdenum, Niobium, Palladium, Rhodium, Rubidium, Ruthenium, Selenium, Silicon, Strontium, Tantalum, Tellurium, Thallium, Thorium, Vanadium, Wolfram, Yttrium, and Zirconium. Includes descriptions and prices.