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It is not often that new mining companies make their nominal capital stock too small. The tendency just now is to put the figure up to a point very probably out of all proportion to the property. In Utah, however, there has been recently a number of incorporations with very small nominal capital stocks; and this is a curious development which we do not remember seeing anywhere before. The climax is reached in one which we record elsewhere this week. This company has a capital stock of \$5,000 only, but the incorporators evidently intend that there shall still be plenty of shares to deal in. The number of shares is 500,000, the par value being one cent each. Clearly there is a chance for every one to invest here; but there may be a difficulty about paying dividends, if any are earned, to small holders.

Prices of pig iron in England have risen considerably since the beginning of the year, and last week West Coast Bessemer brought \$14.25 to \$14.50; Scotch pig, \$13 to \$13.25, and Cleveland iron, \$11.50 to \$11.75. In Pittsburg last week Bessemer pig sold for \$14.50, while No. 1 Alabama foundry brought \$10.50 at furnace and gray forge \$8.50. The latter prices were very much below the Pittsburg standard, No. 2 foundry selling there at \$15.25, and mill iron at \$14.50. Our prices of iron are now up to or above the English quotations. Exports are therefore impossible at present, and the shipments now going forward are on contracts made some time ago at lower prices. Indeed, we have not just now any surplus to sell abroad, though conditions will doubtless be changed in two or three months, when all the furnaces now being made ready come into blast and are producing pig iron. Our own quotations are, however, somewhat deceptive at the present time, as they apply only to a comparatively small amount of business, and a much larger quantity of pig iron is still being delivered under contracts made at much lower prices. These deliveries will run well up to July, and by that time a greater production may regulate prices.

Some time ago we noticed in the "Engineering and Mining Journal" (November 19th, 1898, page 631) reported discoveries of gold in Ohio, which received some belief locally, but speedily became discredited. The rumors did not die out, however, and have continued to come from time to time from different localities, with more or less positive assertion. The latest of these we found recently in the Masillon "Item," which described the discovery of gold in the town of Malvern, in Carroll County. The "mine" was known as the Shanty Hill Mine, and ores from it said to have yielded from \$28 to \$69 a ton. One L. A. Wartman was discoverer and owner, and he was reported to have organized a company with \$500,000 capital stock and negotiated a sale of part of the stock to Western capitalists. It did not take long, however, for this "gold mine" to come to grief, for a week later we find that the Shanty Hill Mine had been attacked by the sheriff in a suit brought to recover the amount of an unpaid liquor bill owed by Mr. Wartman. The "Ohio Klondike," as the enthusiastic local reporter had referred to it only a week before, is thus closed to the world. It is perhaps fortunate that this occurred before the stock was offered to innocent investors; and it may be a warning to the owner to limit his purchase of liquor, at any rate until after his mine has begun to yield some return.

The industrious promoter is always ready to take advantage of anything which will further his schemes, and one of his favorite devices is the pirating of the names of well-known mines. He cannot steal them altogether, but he is well aware that in boom times like these the investing public—at least the stock buying public—does not stop to discriminate too closely. Take some mine which is known to be flourishing and profitable—the "United Oro," let us say—and straightway we have the stocks of the "United Oro Extension," the "United Oro Junior" and the "United Oro South" offered for sale; all floated on the reputation of the established company, and of course without any pains taken to point out the difference to the buyer. The trick is not a new one by any means, though it has been better known and more practised in London than here, and has been at times very effective. It is of little use to point out that while the "Silver Princess" is a steady dividend payer, the "Silver Prince" is a mere prospect, doubtful at the best and probably worthless. The great majority of the people do not know the difference and do not stop to read the warning, if they see it.

There seems to be no way of putting a stop to this use of names, even when it is morally certain that it is practised with more or less fraudulent intent. The law in nearly all our States permits companies to use names which differ only by a very slight change from one already held, and it is always easy to make an alteration sufficient legally while retaining the essential and attractive part. The law presumes that the public can discriminate; but the public cannot or will not, and the promoter makes profit accordingly.

The attention which has been drawn to the Joplin zinc region in Missouri by high prices and the general prosperity of the district, may

possibly result in an important change in the methods of mining there. The district has always been one of small mines, operated, either under lease or ownership, by men of moderate means; and this system has been favored by the entire separation of the mining and reduction, the latter being carried on by large concerns which bought their ores from the miners. This system has worked very well for the most part, owing to the conditions under which the zinc ores are found. It has made the miners generally independent, and since the rapid rise in the prices of zinc began a few months ago, many of them have made very large profits. The attention of capitalists has been drawn to the region, however, and there has been recently a good deal of buying and leasing of property. This movement, if continued, will bring the control of production into the hands of companies operating on a large scale, and may in time completely change the conditions prevailing there.

The purchases referred to have been made chiefly by New England people or their representatives and three of the new companies—the Missouri Zinc Fields Company, the Boston-Duenweg Mining Company and the Boston-Providence Zinc Company—are already beginning to be important factors in production through their control of mines and ore lands.

The same changes are also taking place in the Southeast Missouri lead field, which is rapidly being consolidated into large properties by companies and capitalists of large means.

A strike of some importance is pending in the Lake Superior iron ore region which may possibly result in serious trouble and in a stoppage of output from the mines of the Old Ranges. The strike was begun by the Miners' Union at Ishpeming, and the demand is not for increased wages—which have already been conceded by the companies—but that no man shall be employed in or about the mines who does not belong to the Union. It is very probable that the mine-owners will resist strenuously, since it must be apparent to them that if they yield now they will be subject to further demands, quite probably of the most unreasonable character. It must be remembered that the demand for labor in the Lake Superior mines is very great this year, and the number of workmen has been insufficient, so that a good many have come in from other places. Most of the mines have been pushing work in order to be ready for the large shipments which will be required as soon as navigation opens, to supply the demand for ores. The strike, therefore, comes at an unfortunate time, and the Union has counted on this as one of the factors in its probable success. The men engaged in it, moreover, have not been satisfied with stopping work themselves, but have attempted to use force to prevent outsiders from working, and indeed to stop all the mines around Ishpeming.

This strike, with the prospect that lake navigation will be unusually late in opening, owing to the severity of the past winter and the lateness of the spring, promises to make iron ore rather scarce at the lower lake ports during the present month. At the opening of the year, the stocks at hand at those ports were not at all large, considering the heavy production last year, and the demand from the furnaces during the winter has left the docks almost bare. A number of the mines have been working through the winter, however, and should be able to begin shipments as soon as their stock-piles can be handled and the vessels are ready to receive them.

THE MICHIGAN COLLEGE OF MINES.

The old jealousy of the Upper Peninsula and its many flourishing interests has cropped out again in the Michigan Legislature this year, and this time it has taken the shape of a proposal to close the Michigan College of Mines at Houghton, or—what amounts practically to the same thing—to transfer it to Ann Arbor and make it part of the State University there. We have previously noted measures to impose excessive and unjust taxation upon Upper Peninsula interests in the shape of taxes on the stocks and output of the iron and copper mines. Now the mining companies, as a rule, are large corporations and quite able to take care of themselves and to protect their own interests; but an institution like the College of Mines, dependent on State aid and support, has not the same advantage. The members from the Upper Peninsula constitute too small a minority to make an effective opposition when any determined attack is made.

The proposition seems to us wholly indefensible. The College of Mines at Houghton is in an almost ideal location. It is in the center of a great mining district and is within easy reach of nearly all the mines in the State. The students are able to study the most advanced mining methods on the spot and can supplement their scientific training in a way which very few schools of the kind can offer. The school is in a mining community, where every influence tends to its growth and completeness. From this fact also it is able to extend aid to many who are not able to attend regularly, in the form of lectures and other occasional instruction.

We have nothing to say against the State University, which is an ex-

cellent and popular institution and is doing good work in various lines. But Ann Arbor is not the location for a mining school. It is out of reach of all the opportunities for practical instruction which abound at Houghton. The mining school would there be overshadowed by other and more popular courses, and would present nothing to attract students. In fact, the University has had for years a course in mining engineering, but with hardly any scholars and only an occasional graduate. There is no reason why it should have more.

The Houghton College of Mines has done excellent work, and has grown up from small beginnings to be an institution of high reputation, and a credit to the labors of its able and devoted staff of instructors. That it should be damaged or crippled by the petty jealousies of practical politicians should not be permitted, and we hope that the practical sense of the people of Michigan will not suffer any such result. The friends of technical education and mining interests everywhere ought to take an interest in this matter and file their earnest protests.

EXPORTS AND DUTIES.

We have received a letter from a prominent firm of machine manufacturers in relation to the tariff levied by the present law on imported machinery and especially on machine tools; and we understand that the firm in question has written to a number of manufacturers and others engaged in the same line of trade. This letter is of interest from the fact that it puts the tariff question in a new light; at least in a light in which we do not think that many manufacturers have regarded it. As we all know, American competition has been felt abroad in many lines of trade during the past year, to an extent which was never before deemed possible. European manufacturers have had their eyes opened to the extent of our resources and the excellence of our methods of manufacture, and they have consequently come to dread American competition. This is especially the case in Germany, and many of the German manufacturers of machinery have urged the adoption of a retaliatory tariff policy. They desire that the duties imposed on American machinery should at least be equal to those which the United States levies on German products. Now our own duties are practically of no benefit to our manufacturers, since they have no reason to fear outside competition, being abundantly able to take care of themselves, and to hold their own market by cheapness of production and superiority in design. It is argued that if the duty should be reduced to a very low point, or removed altogether, there could be no talk of retaliation. Of course, this would not prevent Germany or any other nation from levying duties on imports from the United States, but it would certainly be an assistance in supporting our side of the argument in case of any controversy.

The fact is, that in the present state of trade here and abroad, the machine manufacturers are practically in no danger of foreign competition. It is quite probable that the removal of the duties, while at would have no special effect in reality, would nevertheless help to remove some of the feeling against us which now exists abroad.

Some of this feeling caused by the appearance of our manufacturers as competitors is shown by the controversy which has been stirred up in England by the letting of the contract for the great Atbara Bridge on the Soudan Railroad to the Pencoyd Works. The despatches report British contractors, or some of them, as being stirred up to the length of making accusations against the Government or its officers of unduly favoring American bidders and modifying specifications for their benefit. This, of course, is absurd. The simple fact seems to be that not only was the American bid the lowest, but that time was also an important element, and the American firm was able to promise completion of the work in a few weeks, where its British competitors would have required as many months, notwithstanding the greater distance of the American shops. If the reports be correct, it is evident that some of the protesting firms have very little idea of the capacity of American works and their ability to turn out material at short notice.

The same element of time has entered very largely into recent orders for locomotives and railroad material which have recently been placed in this country for British railroads, and which have called out a great deal of comment there. Our works were able to promise early deliveries, which their competitors were entirely unable to make, and so secured not only the present orders, but the prospect of future trade. The fact is, that we build in a different way in this country. The foreign manufacturer usually gauges as nearly as he can the average demand and aims to have his works able to supply that; so that in case of very active business and large demand he necessarily drops away behind his orders. The American manufacturer, as a rule, builds for the future, and tries to be able to meet what he hopes and believes the demand will grow up to in the course of a few years. He is inclined sometimes to go too fast, and build beyond his resources; but when the demand does come he is ready for it. Something is also due to the greater adaptability of the American workman, and his willingness and ability to increase production under pressure.

To go back a little, the suggestion which we noted above, will doubtless be opposed by some parties who do not want—either from honest conviction or for special reasons of their own—to see the tariff question discussed, since they cannot avoid the knowledge that a strong feeling against high protective duties is growing up in this country, and they are aware that any opening of the question will certainly make this feeling apparent. The past two years have educated people very rapidly, and the majority are beginning to see that removal of restrictions to trade will benefit the whole people, and can work injury only to a few special interests which have already been favored far more than they should.

NEW PUBLICATIONS.

"The Gold Fields of Australasia." By Karl Schmeisser, assisted by Karl Vogelsang. Translated by Henry Louis. London and New York; Macmillan & Co. Large 8vo., cloth; pages, 254; illustrated with half-tone views and 13 plates, in portfolio, of maps, sections and statistical charts. Price, \$10.

Dr. Schmeisser has succeeded in making not only a very comprehensive compendium of the gold-mining industry of Australasia, but also a very readable book, which will be appreciated by the non-professional reader, as well as by engineers, geologists, etc. He was sent by a London syndicate to make a report upon the gold fields of Western Australia, but extended his research to include all of the seven colonies of Australasia—Queensland, New South Wales, Victoria, South Australia, Western Australia, Tasmania and New Zealand. Within the time available it was not possible, of course, to make detailed examinations of all the numerous districts, so widely scattered and not always easily accessible, or even to visit all of them, and still less the individual mines, but Dr. Schmeisser and his able coadjutor must have been very industrious to cover so much ground as they did and find time besides for the very thorough compilation of the official records of the colonial geological surveys and statistical bureaus.

The introductory chapter summarizes the geography of the Australian Continent, Tasmania and New Zealand, with notes on the climate, fauna and flora, and a sketch of the history of the colonies, their population, sanitary condition, towns, legislation, judicial administration, finances, transportation, commerce, banking, etc.

Chapter II. takes up the general geology of the colonies, collectively and separately; then the geology of the gold deposits, classifying the veins according to the rocks and formations in which they occur, not attempting to specify the age of the fissures (which is always a more or less doubtful question), nor even in all cases the age of the country rocks, which in Australasia range all the way from the granite and archaic to the cenozoic—that is, practically the whole series. As to the nature of the country rock of the Coolgardie and Kalgoorlie (East Coolgardie) districts of West Australia, about which there has been so much discussion among the petrographers, Dr. Schmeisser goes into considerable detail, and quotes freely from other observers, arriving at the conclusion that the rocks which are called diorites by the miners and some petrographers, have usually a more or less schistose structure, and consist essentially of hornblende, this description corresponding to the term amphibolite. As the surface rocks of Kalgoorlie are so much decomposed and altered, and the workings so shallow (when visited by the author) and exposures so limited, the final decision as to this and other mooted points, such as the origin of some of the veins in the new districts, will have to await further development and study under more advantageous conditions. This remark applies also to the explanation of the almost unique Mt. Morgan deposit, in Queensland, and many similar unsettled questions. The diluvial and alluvial auriferous deposits are classified under the heads older (Tertiary) deep gravels, recent gravels, "travelling gravels" and marine deposits. As to the mode of occurrence of the gold, Dr. Schmeisser recognizes the two main classes of primary deposits and the sedimentary rocks and gravels, to which might be added the "recent," or later derived gravels.

In regard to the fineness of gold from the primary deposits, it is stated that there is no necessary relation between the quality of the gold in situ and that of the gold obtained; the quality depending upon not only the natural impurities, but also the process of extraction and the care exercised in the treatment; yet some idea of the variation may be had by comparing a few extreme figures: Thus in the Croydon District (V.) gold derived from "reefs" in the granite is worth only £2 4s. per oz. (\$10.70), while that from reefs in felsite and porphyry is worth £3 4s. (\$15.57). West Australia gold has a high average value, about £3 15s. (\$18.24), ranging from £3 8s. to £4 4s. (\$16.54 to \$20.44), the exceptional purity of Kalgoorlie gold being perhaps explained by partial solution of the tellurium and silver alloyed with it. The alluvial gold, being obtained by simple processes which do not materially affect the fineness, the small quantities of other metals collected when mercury is used in the sluices being insignificant, gives a close approximation to its native character. That from the Drysdale fields is worth only £2 15s. (\$13.38) per oz., while that from the sea sand of the Richmond River is very pure, running up to £4 2s. 3d. (\$20.01). The gold from the deep gravels is purer than that from surface placers, this again being ascribed to solution of the silver. The author quotes Prof. Liversidge's statement that the gold from the Mt. Morgan district goes as high as .997 fine, which, of course, is exceptional. No perfectly pure gold has been found.

The biggest nuggets catalogued are from Victoria and New South Wales. The list is headed by the "Welcome Stranger" (Moligul, V., 1869), 2,240 oz. net, £9,534 (\$46,392); "Welcome" (Ballarat, V., 1858), 2,193 oz. net, £9,325 (\$45,375); "Blanche Barkly" (Kingover, V., 1857), 1,743 oz. gross, £6,915 (\$33,638); "Canadian" (Ballarat, V., 1853), 1,319 oz. net, £5,532 (\$26,919), and five others ranging down to 1,117 oz. gross, also from the two colonies named.

The minerals associated with gold in the primary deposits embrace a

large number, and correspond to the associations noted in this and other countries—the more frequent being iron pyrite (sometimes almost the only associate, as in the eruptive rocks, but usually, in "reefs," it occurs together with many other minerals); marcasite, arsenopyrite, limonite (from decomposed pyrite), chalcopyrite, pyrrhotite, galena, zincblende, fahlore, bournonite and argentite, the last seven more sparingly; stibnite very rarely, and molybdenite exceptionally. Tellurium combinations are common in the new districts of West Australia, making the ore refractory, and have long been known in small quantities in the Thames district, N. Z. There is the usual distinction between the deeper "sulphuret" ores and the upper and surface oxidized ores (and free gold) resulting from the decomposition of the former, the products being iron sulphate, brown iron ore, specular iron ore, other ores of iron and manganese, cuprite, melaconite, cerussite, crocoisite, angle-site, malachite, chersyllite, antimony ochre, etc.

In the alluvial deposits the associated minerals correspond to those found in the California and other gold gravels, with perhaps more of the gemstone class—diamonds (Beckwith Field, V., and Bingara Field, N. S. W.); sapphire, ruby, beryl, topaz, emerald, zircon, spinel, garnet, etc., being noted as occurring; the platinum group being represented by platinum and osmiridium; and other minerals, such as tinstone, ilmenite, magnetite, native copper, red and brown hematite, pyrite, pyrolusite, galena, blende, tourmaline, magnesite, etc.

The third and last chapter discusses Australasian gold mining, beginning with the history of the discoveries of gold and traditions of supposed early discoveries. The practical starting point of the gold-mining industry dates as late as February 12th, 1851, when Hargraves, returning to Australia from the California rush, made an important strike at Summerhill Creek, near Bathurst, N. S. W., winning thereby the £15,000 reward offered by the governments of New South Wales and Victoria. Since then gold mining has followed much the same course as in the far West of this country, the known auriferous areas being gradually extended, new districts being opened, and in places thickly settled. The author devotes a section to the mining laws of the colonies. He does not go into much detail as to the technology of gold mining and extraction, and indeed there is nothing especially novel to describe. The recent adaptations of the cyanide process in Australia and New Zealand are, by the way, well summarized in F. L. Bosquill's new book on that process.

The appendices contain statistical matter, compiled from the government reports, as to production, etc. In a companion portfolio are a number of finely rendered maps and sections, together with statistical charts. The book is not only a most acceptable one in point of subject matter, clearness, logical arrangement and thoroughness, but is also a very handsome exemplification of the typographic, illustrative and binder's art.

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.

"Practical Notes on Hydraulic Mining." By George H. Evans. San Francisco, Cal.; John Taylor & Co. Pocketbook, pages, 48.

"Hydraulic Mining: Part II., Flumes, Tunnels, Pipes." By C. C. Longridge. London, England; the "Mining Journal." Pages, 64; illustrated. Price (in New York), \$1.40.

"Alloys of Iron and Nickel." By Robert A. Hadfield. Extract from "Proceedings" of the Institution of Civil Engineers. London, England; published by the Institution. Pages, 140; illustrated.

"Paganini's Photogrammische Instrumente und Apparate für die Rekonstruktion Photogrammetrischer Aufnahmen." By E. Dolezal. Reprinted from "Der Mechaniker." Berlin, Germany; F. & M. Harrwitz. Pamphlet; pages, 16; illustrated.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

Letters should be addressed to the MANAGING EDITOR.

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

Correspondence Schools.

Sir:—The prominence you have given to the communications regarding correspondence schools in the columns of the "Engineering and Mining Journal" has, I believe, benefitted a great many people by calling their attention to this excellent method of instruction.

I became interested in the letters, and as I had wanted for a long time to take up the study of mining engineering, but was unable to leave off work to attend a scientific school, this correspondence system seemed to be just the thing to help me out of the difficulty.

J. L. T.

Brewsters, N. Y., March 7, 1899.

Sir:—From the statistics given by Mr. Williams in your issue of February 11th, on the large number of accidents to mine workers, fatal and otherwise, and the number of orders it has been necessary for the inspectors to give regarding the handling of explosives, timbering, dividing shafts and constructing ladders, etc., it would seem that there is, indeed, a large field for correspondence schools. Ignorance of the requirements for the proper protection of employees is usually the cause of these accidents and it is not surprising that so many intelligent and thinking mine workers are taking advantage of the opportunity pre-

sented by the correspondence schools to gain a better knowledge of their business.

J. Gorden.

Carbondale, Pa., March 10, 1899.

Sir:—In your issue of March 4th I noticed a communication from A. W. regarding the relative merits of technically and practically educated mine and furnace workers. I fully agree with A. W. and believe that the mine worker who has learned the practical part of his profession is stilled so far as advancement is concerned unless he has some scientific knowledge of the work at which he is employed.

C. A. F.

Butte, Mont., March 1, 1899.

Dear Sir:—I have read the editorial in your issue of January 7th, on correspondence schools and the interesting correspondence that has followed regarding the value of this system of instruction to mine workers, machinists, etc., I have been studying a comparatively short time, but the improvement I have made in mathematics has more than repaid me for the time and money I have spent. I do not find studying at home evenings at all unpleasant. On the contrary, as my duties during the day require more physical than mental work, studying becomes a pleasure and a rest. I intend to complete the course, and I feel that I shall have no cause to regret it.

J. Stilson.

Denver, Colo., April 1, 1899.

Sir:—In your issue of February 1st I notice a letter from the United Correspondence Schools giving an outline of their system of instruction and stating that they had placed a number of free scholarships at your disposal to be awarded to your readers in any way you desire. I would like to suggest as a means of disposing of a scholarship that a number of employees, say twenty or more, in any branch of mining work, send you their names and the class of work they are engaged in, stating that they wish to compete for one of the scholarships. If you should decide to award them a scholarship they could decide among themselves, by vote or otherwise, which one was entitled to it. This would give some young man an opportunity to secure a technical education, and as he advanced in his studies and gained knowledge, it would be an object lesson to the others in the benefits of a technical training.

C. W. S.

Leadville, Colo., March 28, 1899.

(Our correspondent had better write the school, which we are sure would gladly give the free scholarship as suggested.—Editor E. & M. J.)

TIN PLATE PRODUCTION IN THE UNITED STATES.

The Treasury report of the production of tin-plate and black plate in the United States shows that during the six months ending December 31st there was produced in the United States a total of 372,821,984 lbs. of tin-plates. On the usual basis of 108 lbs. to the box, this would give an output of 3,452,055 boxes. The total output of black plates was 462,838,995 lbs. Taking the number of mills in operation, which was 252, the average product of black plate per mill for the six months was 17,006 boxes, or 654 boxes (of 108 lbs. each) per week. This is a high average, showing that most of the mills must have been run pretty steadily.

The total production of black plates for the calendar year 1898 was 876,954,434 lbs. The total quantity of tin-plates made was 732,290,285 lbs., which is equivalent to 6,780,465 boxes of finished tin-plate.

The first production reported was in the half-year ending December 31st, 1891, when mills in the United States made 8,738,113 lbs. of black plates for tinning, and 2,236,743 lbs. of finished tin-plates. The production for the seven years from 1892 to 1898, inclusive, is shown in the following table, in pounds:

	Black Plates.	Tin-plates.
1892	40,478,816	42,119,192
1893	71,673,146	123,606,707
1894	125,795,171	166,343,409
1895	278,223,707	225,004,869
1896	366,180,809	369,229,796
1897	601,890,476	574,759,628
1898	876,954,434	732,290,285

The growth of the industry is shown in this table in a very striking way. Our production of tin-plates is not only meeting in great part the home demand, but there is a surplus for export, and it is probable that a trade in these plates will be built up to a considerable extent within the next year or two.

The imports of tin and terne plates for the year 1898 were 149,576,525 lbs.; which compares with 187,825,880 lbs. in 1897, and 266,943,267 lbs. in 1896. These figures show the steady and still continuing decrease in the imports.

MINERAL PRODUCTION OF SPAIN.

In previous articles we have given the production of coal and iron in Spain, and to these we now add the production of other minerals. These statistics were for a number of years past compiled yearly by the late Senor Roman Oriol, and the compilation is now continued by his successor, Senor Adriano Contreras, and published in the "Revista Minera."

Silver.—The silver obtained in 1898 in the seven works in which lead is desilverized, and in the works of Hiendelaendina in which dry silver ores are treated, amounted in all to 114,020 kgs. This does not include the silver exported in argentiferous lead, which may be estimated at 115,000 kgs. additional, making the total production in Spain for the year 1898 a total of 229,000 kgs.

Lead.—The total output of lead in Spain in 1898 was 193,764 metric tons, showing an increase of 4,548 tons over 1897. The production last year was divided as follows: Lead consumed in the country, 8,509 tons; lead exported in pigs and bars, 179,885 tons; lead exported in manufactured forms, 979 tons; lead in ores exported, 4,400 tons. It thus appears that out of the total production of lead only 4.4 per cent.

was consumed in Spain. The total production of lead ores is estimated at 352,000 tons.

Manganese Ore.—The production of manganese ores is limited at present to the district of Huelva, but is increasing. In 1898 the exports were 138,062 tons, of which 126,769 tons were sent to Belgium, 6,586 tons to France, 4,179 tons to England, and 528 tons to Germany. The increase over 1897 was 37,729 tons, or 37.6 per cent. This production has grown very rapidly, the output in 1894 having been only 7,321 tons.

Quicksilver.—The production of quicksilver from all the works and mines in 1898 amounted to 48,722 flasks, which is a decrease of 1,361 flasks, or 2.7 per cent., from that of 1897. Of the production last year about 96 per cent.—46,211 flasks—came from the Almaden Mine; 1,450 flasks from El Porvenir, and the remainder from various smaller mines.

Copper.—The exports of copper and copper ores were as follows, in metric tons:

	1897.	1898.
Copper ores	822,570	912,238
Copper matte	15,432	17,260
Copper precipitate	36,055	31,574

The production of the Rio Tinto Mines showed a small increase over 1897. The output of these mines for 1898 is reported as follows: Copper ore, 1,465,380 metric tons; dry precipitate, 18,722 tons; copper matte, 16,024 tons; copper slags, 444 tons; copper sulphate, 4,481 tons. The mines of Sotiel-Coronada produced 31,027 tons of ore and 1,118 tons of precipitate. In the Asturias the mine of Aramo, which has been under development for about a year past, shipped 102 tons of concentrates, which averaged 10 per cent. copper and 0.6 per cent. cobalt.

Iron Pyrites.—The exports of iron pyrites in 1898 were 260,076 metric tons, an increase of 42,471 tons over 1897. These exports were almost entirely from Huelva. The Rio Tinto Company produced last year 70,814 tons of pyrites carrying no copper, the first production of this kind reported by the company. The Aguas Tenidas Company, formerly a large producer, made no report for 1898.

Zinc.—The exports of zinc ore and spelter were, in metric tons, as follows:

	1897.	1898.
Zinc ore	41,040	65,333
Spelter (metallic zinc)	2,170	4,551

The estimated production of zinc ores in 1898 was 90,000 metric tons of blende and calamine, against 62,000 tons in the previous year. The zinc works of Arnao, the only ones in Spain, report that they turned out last year 8,500 tons of spelter in bars and sheets.

Salt.—The production of salt was, approximately, 495,000 metric tons, as compared with 508,605 tons in 1897 and 521,751 tons in 1896. The exports of salt were 219,301 tons in 1898, or 16,570 tons less than that in 1897. The principal works are those of Torrevieja, which reported 85,000 tons last year, and of Ibiza, which turned out 80,000 tons.

Other Metals.—An export of 50 tons of antimony is reported in 1898, and of 413 kgs. of gold in bars or ingots.

FULLERS' EARTH IN CALIFORNIA.—The deposit of fullers' earth recently opened by S. S. Simon at Poso Creek, 17 miles north of Bakersfield, so far as determined, covers an area of about 80 acres, and has been uncovered to a depth of 30 to 40 ft. at various places without reaching bottom. Mr. Simon advises us that he has shipped about 100 tons to the different packing houses in the State, who have pronounced it as good as the English earth for filtering purposes and far superior for bleaching, inasmuch as it is quite odorless. Estimates are being prepared for a plant with a capacity of 50 tons daily. It is said A. S. Cooper, of the State Mining Bureau, has pronounced the California fuller's earth high grade.

GERMAN PATENT LAW.—In the "Journal" of the Society of German Mechanical Engineers Professor Riedler of Berlin recently published a paper on the German patent law, in which he expressed some complaints regarding the practice of the German Patent Office. He blamed the instability of the principles on which that office bases its decisions and its too narrow limitation of the "notice of invention," whereby a great many applications, both of foreign and German inventors, are rejected every year. This has proved to be prejudicial, especially to the inventions of engineers made on the basis and with the help of science, and consequently appearing sometimes almost self-evident, though a large amount of difficult mental work must be done to apply scientific knowledge practically. Mr. Riedler advocates the issue of patents for all inventions embodying technical progress, the promotion of which is the real object of the patent law.

RESCUING THE INJURED IN MINE ACCIDENTS.—In a discourse, delivered by request of the Technical Mine Officials' Association at Herne, Westphalia, on December 18th, by Bergwerksdirektor G. A. Meyer, as to the rescue arrangements at the Shamrock Colliery, he insisted strongly on the importance of giving the necessary first care to sufferers by underground fires or explosions, because upon the assistance rendered during the first hour or half hour a man's life often depends. In each overman's district of the above-named colliery there is a tin box containing splints and bandages, an ambulance of special construction that can be hoisted up or hauled down if necessary, a thick blanket in a tin-lined box, and a straw mat, 80 cm. square, the total cost of which appliances amounts to 49 marks (\$11.66). A special room for receiving the injured that has been added to the new washing and dressing rooms on the surface, cost, with its accessories, 1,430 marks (\$340), while the whole expenses during 1897 did not amount to 900 marks (\$214). In 1892 the administration of the colliery formed, at the suggestion of Mr. W. E. Garforth, mining engineer, who had lately visited the colliery, a sanitary and medical corps under the direction of any army hospital surgeon, the number of those voluntarily joining it having varied from 30 to 40. During the years 1896-1898, up to the date of the discourse, the members of this corps showed themselves capable, on 200 occasions, of temporarily bandaging the injured and conveying them from the underground workings to the surface.

IMPROVEMENTS IN THE RANDSBURG DISTRICT, CALIFORNIA.

The Yellow Aster Mining Company at Randsburg, Cal., recently started its mill, which is the largest in the district. The mill has 30 stamps and is thoroughly equipped with all the latest improvements. The mill building is placed on a hillside, about 1,500 ft. from the main working shaft of the mine and somewhat lower, so that the transportation of the ore is done by gravity. The ore trammed from the mine is dumped from the cars into a chute, which carries it to a crusher having a capacity of 20 tons an hour. The broken ore from the crusher falls into the main ore bin, which will hold 250 tons. From this bin it is drawn through chutes, as required, to the automatic self-feeders which supply the stamps. The battery stands on a stone foundation, supported on a cement bed. The ore, after crushing, passes out through a single front screen to the copper plates, which drain into cast-iron traps, whence the pulp is carried to the concentrators, which are placed in a room on a lower level than the stamps, so that the handling is done by gravity. The tailings from the concentrators are carried through a large iron pipe to the settling ponds, which are about 2,000 ft. down the gulch from the mill. From the last pond the clear water is returned to the mill by a pump to be used over again.

The machinery was built by the Union Iron Works in San Francisco. The water supply of the mill is brought from the company's wells, which are six miles from the mill. It is pumped through a 5-inch pipe to the tanks, which are of iron, three in number, having a capacity of 25,000 gallons each. From these tanks the mill supply is drawn. In the clean-up and melting room there is a revolving barrel for washing and cleaning the amalgam, melting and assay furnaces and other conveniences.

The motive power is furnished by a Wheelock-Corliss engine, which drives all the mill machinery proper, power being transmitted by ropes. The engine room, which is 20 by 40 ft. in size, contains, besides the engine, an electric plant having a capacity of 500 lights of 16-candle power each. The dynamo is driven by a separate engine, and light is furnished to the mine, the mill and all the buildings of the company. The electric equipment consists of a 30-k.w. 125-volt multipolar generator, made by the Westinghouse Electric Company.

Steam is supplied to all the boilers by two large boilers, of which one is usually sufficient, the other being held in reserve. The fuel used is crude petroleum from the Southern California wells. The oil is stored in a large tank placed on the hillside, slightly above the mill, which will hold 30,000 gallons, and the oil is conveyed to the fire-chambers through pipes. The mill is now in successful operation, under the direct charge of Mr. John Singleton, president and general manager of the company.

The water supply, which, as already mentioned, is brought from a distance of six miles, is pumped from a shaft or well which was carried down to a depth of 200 ft. From the bottom of the shaft a tunnel or drift was run for 173 ft. along the water-bearing strata, every foot increasing the flow of water. Mr. F. M. Mooers, vice-president of the company, expresses the opinion that this water-bearing stratum is the bed of an ancient river, which has been covered up in some comparatively recent seismic disturbance. From a prominent point on one of the neighboring peaks it is not difficult to trace the course of the old river bed, while the fact that water has been found at different points at depths ranging from 40 to 300 ft., according to the altitude of the valley, seems to support the theory. Mr. Mooers also says that it was a matter of tradition among the Plutes, who originally inhabited this section, that the valley in which the Randsburg District lies, was formerly fertile and abundantly supplied with water, besides being more extensive than it is at present. There are some indications that this tradition was probably founded on fact.

MONAZITE CONCESSIONS IN BRAZIL.

United States Consul H. W. Furniss, at Bahia, Brazil, referring to the present condition of the monazite industry in Brazil, says that several years ago the Federal Government gave to Mr. John Gordon, an American citizen resident at Rio de Janeiro, the right to extract any and all sand contained in the "marinhas," which is a strip of land along the coast, extending inward 33 meters from a point midway between the highest and lowest tide, reserved by the Government for defensive purposes. In addition to this federal grant, Mr. Gordon obtained a municipal grant from the town of Prado, which is in close proximity to the largest deposits of sand. He also acquired by purchase considerable private property bordering on the deposit. For some time he had ships go to Prado and load this sand under the name of ballast; but finally the State and Federal Government became aware of the value of the sand (at that time it was worth about £80 per ton), and after considerable discussion he was forced to pay as export tax on each ton 22 per cent. of its estimated value for State, 2 per cent. for what is styled "statistical purposes," 2½ per cent. federal, and a municipal tax of about 1 per cent. if it lands at Bahia.

The trade was large until 1896, when the Governor claimed, in the name of the State, part of the deposit, and refused to allow any sand to be removed therefrom, unless under State concession. He claimed that the federal lands were not as extensive as had been said. After much argument, the Governor decided to force the contention, and finally gave State concessions as follows: June 8th, 1898, to Rebeiro & Co., 5,000 tons; July 18th, 1898, to S. S. Schindler, an American resident in Bahia, 5,800 tons; and September 2d, 1898, to Manuel Duarte, 5,000 tons.

In the latter part of December Mr. Gordon made a contract, which has recently been signed and published in the official paper. The Governor, on behalf of the State, granted to him for 20 years the exclusive right to remove monazite sand from the lands of the State and that in the districts of Alcobago and Porto Seguro, Gordon binding himself to pay the State £1 at the exchange of the day for each ton removed, in addition to the State and other export taxes.

All concessions already granted—for 15,800 tons—were transferred to him by the concessionaires, Gordon binding himself to pay them pro rata £2 for each ton until the 15,000 tons are removed. The concessionaires also agree to stop all suits, etc., relative to the title of the land and the right to remove the sand, relinquishing all claims except that above stated. Gordon now has the exclusive right for the extraction of monazite sand in Brazil, the largest and richest deposit ever discovered.

This sand deposit is on the coast of Bahia, near the little town of Prado. The town is reached after four or five days' slow travel by coastwise steamers; but, on account of the bar before the town, steamers frequently have to wait for more than ten days before they can enter. The sand occurs in great cliffs along the seashore, and is most frequently collected from what is washed down by storms and tides. Great quantities are under tidewater, while a practically unlimited quantity is always high and dry in the cliff. No attempt is made to purify the sand before shipment, the only expense other than the tribute already mentioned being the cost of collecting it and loading the ships.

According to the analysis made under State direction, the sand contains: Thorium, 1.5 to 3 per cent.; yttrium, 1 to 3; cerium, 62 to 70; aluminum, 3; iron, 2.5 to 5; lanthanum, 2.5 per cent. On account of the high per cent. of thorium, it is in greater demand than other sands.

During the year 1898 there were exported 2,338 sacks and 220 barrels of this sand to Hamburg and 1,300 sacks to Southampton. The sacks were of heavy cotton, holding 45 kilograms; 22 sacks make a ton. The barrels contain about as much as two sacks.

IRON ORE FOR JAPAN.—It is stated from San Francisco that Anthony Godbe and associates have made a contract to supply the Japanese Government iron works with 500,000 tons of iron ore, delivery to extend over several years. The ore is to be taken from the deposits at San Isidro, some distance south of Ensenada, in Lower California.

WULFENITE IN ARIZONA.—Shipments of wulfenite (tungsten ore) from the Mammoth Mine in Pinal County in Arizona last year amounted to 12 short tons of about 90 per cent. purity. The shipper paid the company \$15 a ton for this mineral at the dump of the mine, where it had accumulated. The destination of the shipments is not known. With shipments previously reported from Dragoon Summit, this makes a total of 1,900 lbs. tungsten ore shipped from Arizona in 1898.

CHROME ORE IN NEW ZEALAND.—The "New Zealand Mines Record" for January, 1899, says: "A firm of metal merchants in Liverpool lately communicated with the Government Geologist requesting information as to deposits of chrome ore, wolfram and scheelite in New Zealand. In reply Mr. McKay states that chromate of iron occurs only in the Nelson District and the West of Otago, in the Middle Island; while in the last mentioned the ore occurs at quite inaccessible places, and therefore need not be considered. Wolfram occurs in Stewart Island, but it is doubtful if it would prove payable to work. Scheelite occurs in the Otago Provincial District, near Lake Wakatipu, where there is a lode about 4 ft. wide, consisting of a mixture about half quartz and half scheelite in bulk. This was formerly worked, but the price fell till the deposit did not pay to mine. There are other places where scheelite is found in connection with quartz lodes that are being worked for gold, but in what quantities it can thus be produced has not been ascertained. Rhodochrosite (carbonate of magnesite) occurs plentifully in the neighborhood of Wellington."

RAILROADS IN BRAZIL.—The opening and colonization of the fertile forest lands in Rio Grande do Sul, the most southern State of Brazil, seems to be possible only if railroads bring the settlers and their products into direct communication with the coast. A German concern intends starting from the navigable River Uruguay to build a railroad into the virgin forests in a northeasterly direction, connecting at its southwest terminus with Tupacretan, the end of a railroad already in operation. A party of engineers sent by the firm of Arthur Koppel, of New York and Berlin, is at present engaged in making the preliminary studies for this new railroad.

The engineers sent out by the same firm to study the projected railroads in the province of Santa Catherina, have returned and presented their reports, which are accompanied by much statistical information. The State is badly in need of railroad connection with the coast, and the present traffic is sufficient to make such an enterprise a paying one from the start. It is believed that this traffic will steadily increase according to the development of the country.

IMPORTS OF EXPLOSIVES IN PERU.—United States Consul Dickey writes from Callao, December 27th, 1898, as follows: The total amount of dynamite, powder, etc., imported into Peru from July 1st, 1897, to June 30th, 1898, was: Dynamite, 4,412 cases, weighing 20,295 kg. (44,742 lbs.); blasting and mining powder, 52 packages, a total weight of 2,911 kg. (6,417 lbs.); common black sporting powder, 486 boxes, weighing 2,770 kg. (6,107 lbs.) in all; triple dynamite fulminants, 1,435,000; shot-gun fulminants, 3,240,000; fuse for dynamite fulminants, 164,900 rolls.

All explosives imported into Peru must be deposited in the vaults of the Sociedad San Lorenzo, in the Island of San Lorenzo, about 7 miles from Callao, and pay 20c. silver (about 10c. gold) per box. With the exception of sporting powder, imported in small tins, which pays a duty of 50c. silver a kilogram (about 25c. in United States money), all explosives are free of duty. Explosives are principally imported from Germany, England, and France, and a little from the United States. Among the principal importers of explosives in Peru are W. R. Grace & Co., J. Normand, E. Haines & Co., J. Ludowig & Co., Duncan Fox & Co., Enrique Ayulo & Co., C. M. Schroder & Co., and C. Weiss & Co., all of Lima; Milne & Co., and Sociedad San Lorenzo, of Callao.

A GOLD EXCITEMENT IN NEBRASKA

Written for the Engineering and Mining Journal by Edwin H. Barbour.

For several years past, noticeably during 1896 and 1897, the gold excitement in Nebraska, especially around Milford, has been sufficient to prove disquieting. Many citizens have been unsettled to such an extent that farms have been bought and sold, time and money squandered, and unnecessary loss entailed. The excitement spread throughout the State, and still continues in a mild form. So many exaggerated statements passed from the local press into the wider circulation of the larger papers, that inquiries came from many cities at home and abroad respecting the discovery of gold in the soils of this region.

The mineral resources of a prairie State like Nebraska lie chiefly in her soils, from which more gold and silver may be extracted by the plow and harrow than by other means known as yet. However, the subject of gold and silver in the State is not to be despatched in an off-hand way, for, as a matter of fact, gold and silver have been found, and the history of the precious metals, and the excitement incident to their discovery, covers a period of more than 30 years. And there is no telling how long it may continue. The fact is, that while there have been gold excitements for 30 years based upon little more than hope, yet there is a bare possibility of something more substantial than this, resulting from improved methods of extracting low grade ore. Gold and silver occur in the State, but whether they occur in sufficient quantity to be of interest economically, and not merely mineralogically, is quite another matter. As a measure of what is being done, it may be stated that, according to information collected with some care by the author, it is certain that more than \$20,000 is spent annually in prospecting for gold in Southern, and especially Southeastern, Nebraska. If the time spent was reckoned in dollars and cents it would swell this sum.

The State, as a part of the great plain, covering a vast area of nearly 77,000 square miles, though extremely diversified and varying in altitude from 1,000 to nearly 6,000 ft., has no disturbed, upheaved, or metamorphosed rock. On the contrary, the rocks are level, undisturbed sediments, and the gold which does occur, and the sand in which it occurs, is not native but transported; that is, it is glacial drift in the east, and Rocky Mountain drift in the west. The glacial belt covers the eastern third or fourth of the State extending south into Kansas. Throughout this drift, particularly in the more southern counties where the excitement has been liveliest, in addition to mica scales, "fools' gold" and glistening sand, there is free gold in very fine grains. Occasionally one finds drift pebbles rich in free gold. Besides, every community can show you some one who has panned out a little native gold, possibly \$20 or \$30 worth in a lifetime, but no one as yet can call it "pay dirt." However, according to numerous assays made in various cities from Boston to Denver, many of them reliable as far as the assay work goes, it is certain that the average of all these brings the dirt close to the pay limit. But even this statement must be taken guardedly, for there is no way of guaranteeing that all the samples taken are as genuine as the assays. These unauthentic assays run all the way from a trace to \$200 a ton. Several such assays near Milford average \$8 to \$10 per ton; 13 similar assays at Crete run from 62c. to \$5.50 a ton.

However honestly this work has been done, it has been done in such a way, unfortunately, that no one ventures to call it even approximately reliable. This much can be said, however, that enough has been done to show that the matter is worthy of attention such as it has not had from the State geologist, from the fact that there are no funds in the State Treasury for the prosecution of such an investigation. In various towns they have built sluices and riffles and washed 40 to 50 tons of gravel, sometimes getting but little. At Milford 40 tons of gravel were washed, the citizens contributing their time and teams, but with very poor results. At Crete, under the supervision of Mayor Norris, 40 tons were washed and nearly \$12 worth of gold obtained therefrom. The centers of excitement are chiefly Seward, Stanton, and Franklin counties. But it extends as far west as Harlan County; one citizen there spent \$1,000 in 1896 prospecting for gold in a pyritiferous shale. And at Scott's Bluff in the high terraces of the Platte, over 100 claims have been staked out during the past summer.

On the farm of Mr. J. S. Dillenbeck, at Pleasant Dale, Seward County, where the chief excitement has been centered, and where more work and energy has been expended than elsewhere in the State, a 5-ton smelter has been put up, but without results.

All things taken into account, our sands contain more gold than might be expected, and the hope now is that study may reveal the fact that new and improved methods may yet make some of our gravel pay. Inventors in Lincoln and elsewhere, seeing the lack of water in this region, are working upon dry concentrators, with what results remains to be seen.

THE SINGHBHOOM COPPER MINES IN INDIA.

According to a note by Mr. Harold Harris in the London "Mining Journal," the principal mines of this group are situated about 240 miles by rail from Calcutta, in Singhbhoom, Chota Nagpore, Bengal, where there is a belt of copper-bearing country which stretches over a distance of 80 miles in length. The geological formation is sub-metamorphic, consisting principally of micaceous, chloritic schists, quartzites and steatite, the whole formation resting on gneiss granite. There are numerous old workings and large heaps of slag throughout this part of the country. Some of the old workings are very extensive, both in length and width. Some of these workings go down over 100 ft. in depth, to the water level, which was as far as the ancients who worked these mines could go with their primitive appliances. The ore smelted was principally oxides and carbonates, as none of the old workings are down deep enough to strike the pyritic ore. The history of these ancient copper mines is clouded in obscurity, very little information being available, and scarcely a tradition. Professor Ball, in his "Geology of India," says: "Indications exist of mining and smelting having

been carried on in this region from a very early period, and the evidence available points to the Seraks or Jay Janis as being the persons who, perhaps, 2,000 years ago, initiated the mining."

According to local tradition, the central point of the old mine was in the hill fort of Rooamghur, which stood in a commanding position on a spur of Sherdishur Mountain, the remains of the old ditch round the fortress are still visible. The place where a town is said to have been is now covered with copper and iron slag, without trace of buildings, but on the Mahadeo Hill, which is connected, no doubt artificially, with Rooamghur by a high dyke, were found the ruins of the wall of a fort and an old water tower. In 1892 a company called the Rajdolia Copper Company started working at Rajdolia and Rakka. They put down two vertical shafts, each 14 ft. diameter, one at Rajdolia and one at Rakka, some 8 miles apart. The shaft at Rakka is down over 300 ft., and passed through copper-bearing ground from the surface. During the sinking, several beds of copper ore were passed through. Crosscuts were driven from the bottom of the shaft and intersected these beds again in as healthy a condition as in the shaft. The ore is all sulphide, and a bulk of 10 tons of undressed ore from the richest portion of the lode was sent to Liverpool and sold on a dry assay of over 13 per cent. copper. The last lot shipped was in 1894, when 57½ tons were shipped and sold on assay of 13¼ per cent. copper. This had been hand-dressed at the mine. The undressed ore would average from 4 to 7 per cent. copper throughout. At that time the nearest railway station was 24 miles off, and the ore had to be transported that distance in bags by bullock carts, then sent to Calcutta by rail, and thence to Liverpool by ship. This necessitated a lot of handling, which was very expensive. The company had not sufficient funds to put up water-jacketed furnaces, for which treatment the ore is suitable with the use of very little fuel, so the mine was closed down.

There is plenty of water available for smelting, and coal and coke are fairly cheap. Since the closing down of the mine, the Bengal-Nagpore Railway has been carried through and now runs within a mile of the mines. This is one of the best copper properties in India, and could be made a producer in a short time.

UNDERGROUND PHOTOGRAPHY.

The accompanying illustration is another example of successful photographic work underground. The plate is reproduced from a photograph taken in the Gold Bug Mine in Colorado, and shows miners at work drifting on the vein, near the bottom of the shaft. The hoisting bucket and the timbering adjoining are also very clearly shown.

Apart from the special conditions affecting the use of the camera underground, it should be remembered that the proper choice of views has a great deal to do with successful photography. It is not only the proper placing and adjustment of the camera, but the choice of points to be photographed which tells. There is a wide difference always in such views; one may show little or nothing, while another may give some point of special interest, which may show vein formation, methods of working or peculiarities of timbering, haulage methods and the like. To select properly needs something of the artistic eye, but no special faculty, beyond what can be acquired by a reasonable amount of training and a habit of observation.

A VERY LARGE MONOLITH.—The Southern Marble Company recently completed the quarrying of one of the largest blocks ever taken out in one piece in this country. This great block is 27 ft. 2 in. long, 4 ft. 4 in. wide and 4 ft. 3 in. deep, containing about 500 cu. ft. and weighing 100,000 lbs. This block is of white marble, and was taken out at the company's quarry at Marble Hill, in Pickens County, Georgia.

IRON INDUSTRY IN GREECE.—According to the "Eisen-Zeitung," this industry began when the Societe Hellenique de Construction Basiliades built an engineering works in 1862. In 1868 these works were established, and among them in 1872 the Vulcan Works were built by the firm of McDowell and Barbour. Later on iron foundries and copper-smith works were started. These various works find a good field for their products not only in Greece, but in other Oriental countries. The manufactures comprise boilers for factories and ships, agricultural machinery, apparatus for brandy distilleries, oil and wine presses, safes, weighing machines, machinery for sugar mills, flour mills, and for making macaroni, materials for building, wire and diving apparatus for the sponge fisheries, etc.

HOISTING ENGINES FOR GERMAN COLLIERIES.—A great many powerful winding engines, with spiraloid drums, have lately been erected in the Ruhr District of Westphalia, says the London "Colliery Guardian." The Gutehoffnungshütte Company, of Oberhausen, has made four engines for a net load of 3.3 tons, one for a lift of 500 m. for the Neumühle Colliery, and the others for lifts of 700 m., one for the Rhein-Preussen, and the other two engines for the Zollverein Colliery. The Friedrich Wilhelms Hütte Company, at Mühlheim, has built an engine even more powerful for raising a load of 4.4 tons from the depth of 800 m. for the Wilhelmine Viktoria Colliery, and two engines, each capable of raising 2.2 tons of coal from the depth of 700 m., for the Mathias Stinnes Colliery. The diameters of the spiraloid drum are 6.6 m. and 10.6 m., and the width 2.1 m., while the diameter of the shaft, which is 9.9 m. between the center lines of cranks, is 675 mm. in the middle and 475 mm. in the bearings. With these engines the angle made by the rope with the vertical plane passing through the headgear pulley becomes considerable in the extreme positions, causing oblique strains on the pulleys very unfavorable to their preservation and also to that in the winding ropes, which rub against the groove edges. For counteracting this difficulty it was found necessary to erect the engine at a considerable distance from the shaft; but in such case, owing to the great distance between the drums and the pulleys, the ropes are subjected to so considerable a sagging as might occasion a fall of the cages in the event of a sudden stoppage.

ABSTRACTS OF OFFICIAL REPORT.

Horn Silver Mining Company, Utah.

The report of this company covers the year ending December 31st, 1898. The financial result of operations was as follows for the year:

Ore and concentrates sold.....	\$235,506
Store at Frisco.....	15,000
Interest, rents, etc.....	12,808
Total receipts.....	\$263,314
Mining supplies and fuel.....	\$43,415
Mining labor.....	104,658
Mill supplies and fuel.....	12,555
Mill labor.....	24,699
General expenses, taxes, etc.....	34,840
	<hr/> \$220,167

Balance, profit for the year..... \$43,147

The surplus on December 31st, 1897, was \$200,589, making, with the profit above, a total of \$243,736. Four dividends were paid during the year, amounting to 20c. a share, or \$80,000 in all, and leaving a balance of \$163,736 at the close of the year.

The ore extracted during the year was: Shipping ore, 4,928 net tons; milling, 33,961 tons; total, 38,889 tons. The milling ore was concentrated at the rate of 5.7 tons into 1 ton. The cost of milling was \$6.25 per ton of concentrates. The total shipments were 4,928 tons shipping ore and 5,916 tons concentrates, a total of 10,844 tons; the average values being \$17.98 a ton of ore and \$26.90 a ton of concentrates. The total

The receipts for the year were as follows: Lehigh coal lands, \$156,891; canal, \$6,090; railroads operated, \$73,235; rental of Lehigh & Susquehanna Railroad, \$1,430,965; miscellaneous, \$192,603; total, \$1,859,784. The charges were: General expenses, \$71,763; rentals, \$180,911; taxes, \$186,866; interest account, \$860,893; total, \$1,300,433, leaving a surplus of \$559,351. Dividends amounting to \$2 a share, or 4 per cent. on the stock, were paid, the amount being \$573,866. This leaves a balance of \$14,515 to be carried to profit and loss, reducing the balance of that account to \$385,268 at the close of the year. The capital stock is \$14,366,650, and the bonded debt, including bonds endorsed, is \$16,548,083.

The coal carried over the Lehigh & Susquehanna Railroad and Lehigh Canal is reported as follows, in long tons:

Received from:	1897.	1898.
Wyoming Region.....	2,614,127	2,432,190
Upper Lehigh Region, Nescopeck Branch.....	239,596	238,175
Beaver Meadow Region.....	728,363	647,440
Mauch Chunk Region.....	1,468,054	1,353,266
Lehigh Valley R. R.....	7,629	7,603
Schuylkill Region.....	233,041	197,383
Total received.....	5,250,810	4,876,067
Delivered:		
East of Mauch Chunk by rail.....	4,489,366	4,085,517
East of Mauch Chunk by canal.....	302,405	266,286
On line above Mauch Chunk.....	192,568	164,551
Connecting lines above Mauch Chunk.....	266,471	359,703
Total.....	5,250,810	4,876,067

The decrease in tonnage last year was 374,753 tons, or 7.1 per cent.



DRIFTING IN GOLD BUG MINE, COLORADO.

yield of the ore was 69,291 lbs. copper, 7,953,030 lbs. lead, 284,996 oz. silver and 520 oz. gold. The averages, taking all ore mined, were 10.2 per cent. lead, 7.3 oz. silver and 0.013 oz. gold to the ton.

The costs of mining and concentration were as follows:

Ore extraction:	Amount.	Per Ton.
Labor on ore.....	\$65,437	\$1.680
Labor on dead work.....	15,741	0.404
Labor on surface.....	23,906	0.615
Supplies, timber, fuel, etc.....	43,415	1.116
Total mining.....	\$148,499	\$3.815
Concentration:		
Labor.....	24,699	0.727
Supplies, fuel, etc.....	2,555	0.369
Total concentration.....	\$37,254	\$1.096

The total development work done during the year was 657 ft., chiefly in drifting. The results were satisfactory, a fair grade of copper ore being taken from the seventh and eighth levels, while the ninth and tenth levels furnished a fine grade of milling ore, with more than the usual proportion of shipping ore.

Lehigh Coal and Navigation Company, Pennsylvania.

This company owns a large estate in the anthracite region of Pennsylvania; it owns the Lehigh Canal and the Delaware Division Canal. It also owns the Lehigh & Susquehanna Railroad, which it leases to the Central Railroad Company of New Jersey. The report is for the year ending December 31st, 1898.

The tonnage reported from the company's coal properties was as follows:

	1897.		1898.		Changes.
	Tons.	Per Ct.	Tons.	Per Ct.	Tons.
Shipments and sales.....	1,410,203	92.1	1,333,460	92.1	D. 76,743
Used in operating.....	120,620	7.9	117,504	7.9	D. 3,116
Totals.....	1,530,823	100.0	1,450,964	100.0	D. 79,859
Cost of mining, per ton.....	\$1.294		\$1.307		I. \$0.013

The report says: "The production per day is somewhat less than it was in 1897, but larger than in any other previous year. In 1895 it was 7,377 tons; in 1896 it was 8,002 tons; in 1897 it was 8,789 tons, and in 1898 it was 8,484 tons. The average number of days worked by each colliery during the year was 149.08, or 11.35 less than the previous year. The average cost of coal was \$1.307 per ton, as compared with \$1.294 in 1897, an increase of 1.3 cents. Your mines are in condition to make largely increased shipments if called for by market requirements. During part of the past year one of the best collieries, No. 8, was partially suspended on account of a fire, which broke out in the shaft workings, and was discovered September 2d. Every effort was made to put it out until October 30th, when it was found that the only way to control it would be to fill up the shaft workings with water. The water from Panther Creek was at once turned into the mine, and the shaft filled up to a height of 549 ft., which point was considered to be sufficiently above the fire to insure its extinguishment. On December 5th the work of removing the water was begun. It will take some weeks yet to complete the

draining of the mine, but it is anticipated that by the early Spring the colliery will be again producing coal at its usual capacity.

"The business of the canals shows a profit of \$6,090, which is a decrease of \$5,343 from 1897, due principally to the decrease in coal tonnage. The total tonnage moved during the year amounts to 344,463 tons, a decrease of 25,415 tons from 1897. The usual repairs have been made along the line of the canals."

Delaware & Hudson Canal Company.

This company owns a large estate in the anthracite region of Pennsylvania, where it operates a number of collieries. It owns or leases and operates railroad lines in Pennsylvania, New York and Vermont, extending from its coal mines to the Hudson River and Lake Champlain. It owns also the canal from Honesdale to the Hudson River at Rondout; but during the past year it was decided to abandon this water line, which has been operated some 70 years. The report covers the year ending December 31st, 1898.

During that year the company produced from its collieries 3,934,203 long tons of anthracite coal. It transported over its lines for others 1,678,983 tons, making a total of 5,613,186 tons handled and carried to the market. The income account for the year is given below, slightly changed from the form in which it is given in the report, in order to make the meaning of the items clearer:

Sales of coal for the year.....	\$7,485,319
Less decrease in coal on hand.....	277,974
Balance	\$7,207,345
Mining coal.....	\$5,267,325
Transporting coal.....	996,221
Yard and miscellaneous expenses.....	179,292
General expenses and taxes.....	417,251
	<u>6,859,089</u>
Profit on coal.....	\$348,256
Canal tolls.....	50,934
Miscellaneous profits.....	556,256
Net earnings from railroads.....	1,265,373
Total profits.....	\$2,220,819
Interest on bonds.....	350,000
Surplus, 5.35% on stock.....	\$1,870,819

The total earnings of the company's railroad lines were \$9,907,358, and the working expenses \$6,068,507, leaving as net earnings \$3,838,851. Interest, rentals and other charges on leased lines amounted to \$2,573,478, leaving a balance of \$1,265,373, as above.

In the company's statements it appears that, after making allowance for decrease in stocks of coal on hand, the average price received for coal produced during 1898 was \$1.84 a ton. The cost was made up as follows: Mining, \$1.34; transportation, \$0.25; terminal and yard expenses, \$0.05; general expenses and taxes, \$0.11; total, \$1.75. This leaves a profit on coal sold of \$0.09 a ton. The charge for general expenses is probably a little too high, as a portion of that expense should go to the railroad lines; but it is impossible to separate the accounts as given in the reports.

The company's capital stock remains \$35,000,000, and there are \$5,000,000 bonds outstanding, which bear 7 per cent. interest. Loans payable amount to \$1,000,000 more. The investments in coal lands and collieries are charged in the balance sheet at \$21,235,125; in addition to which there is a further sum of \$670,795 for coal yards, boats and other facilities for handling coal.

The report of the managers says: "Your managers, after careful consideration, decided that it would be greatly to your interest to cease operating the canal. The cost of transportation by that route is too great, as compared with other methods, and the increased earnings will, it is believed, much more than compensate for the change. The cost of canal has, therefore, been charged off, and no longer stands as an asset on your books.

"It has been reported that the Gravity Railroad would also be given up. This is an error, as that road will be changed to broad-gauge and be used for the carrying of coal, general freight and passengers, with good prospects of yielding a profitable return. The Gravity equipment has, of course, been marked off—an item of about \$800,000. The general equipment has also been marked down about \$2,000,000, and new and larger equipment will be purchased, by which, as is now generally admitted by railroad experts, the amount so expended will be regained in a short period through the saving in expense of transportation.

"Other reductions, aggregating \$340,323, have been made, as follows: Boats, barges and steamboats, \$167,258; mine improvements, \$100,000; sundry accounts, \$73,065.

"Stockholders, owing to unfounded rumors respecting the coal lands of the company and their near exhaustion, have shown much anxiety upon the subject. Your managers, therefore, decided to order an examination by thoroughly independent experts. This examination has been completed, showing: Tons of coal owned in fee by your company, 165,186,393; tons of coal under lease, 53,361,400; total, 223,547,793.

"Since the last report your managers have sold the stock of the Rutland Railroad at cost and 4 per cent. interest, payable January 1st and July 1st. On this account \$235,000 cash has been received; and of the balance \$100,000 is due on December 1st, 1899, and \$1,165,000 is due on December 1st, 1900. These payments bear interest and are properly secured.

"Your leased roads show a loss of \$5,526 for the year. The first mortgage on the New York & Canada Railroad, \$4,060,000 at 6 per cent. and \$1,000,000 debentures at 4½ per cent. will come due in 1902, when a large saving may be expected from refunding at a lower rate of interest; and \$10,000,000 of Albany & Susquehanna 7 per cent. and 6 per cent. bonds will fall due in 1906. There were added to equipment during the year: 7 locomotives, 50 box cars, 650 coal cars, 2 milk cars, 150 platform cars, 1 baggage and express car; while 3,164 tons of steel rails were purchased and charged to operating expenses.

"The changes alluded to in the above have necessitated some re-adjustment of values in the balance sheet. Fortunately, the practice

of carrying the real property at a very low valuation on the books of the company has rendered this an easy matter, and the valuations now placed upon various properties, especially in the case of your coal lands, are very much below their real value.

"Your managers have decided to recommend that a portion of the net earnings of the company be set aside every year to act as a sinking fund against the mining of coal, and their views will be presented to the stockholders at the annual meeting in May for their action."

COMPRESSION VENTILATORS IN GERMAN COAL MINES.

The compression system of ventilation, as adopted in the Schlesien and Deutschland coal mines in Upper Silesia, is described by Bergassessor Steinhoff in a recent paper*. In the Schlesien Mine the area of the workings is 2,808,508 square metres; there are two shafts, 60 m. apart, each being 260 m. in depth, and opening up three main haulage ways at depths of 165, 230 and 260 metres, respectively, intersecting altogether six seams of workable coal.

The ventilation of these workings is effected by a down draft through shaft No. 1, and a borehole reaching to the upper seam, shaft No. 2, serving as an upcast for the air-current. The temperature in the two downcasts varies with the season, etc., while the upcast is maintained at a constant temperature of 21° to 22° C. by means of steam pipes to facilitate the up draft from the pit.

The current is forced through the workings by a couple of compression ventilators, one of which is at the 165 m. level and the other at the 230 m. level of No. 1 shaft, from which they draw their supply of air. These fans, which were constructed by Honigmann, of Charlottenhof, Upper Silesia, are both of the type shown in Fig. 1, and differ merely in size and a few constructive details. They consist of a fan-wheel (enclosed at one side and with a circular air inlet at the other), surrounded by a fixed diffuser. Each fan carries 12 long and 12 short vanes of sheet metal, and the diameter of the one in the upper level is 2½ m., while that of the fan (Fig. 2) in the 230 m. level is 2.5 m. on the one side and 2.8 m. on the other, the face of the periphery being sloped. The width is the same in each case, 700 mm. at the axis and 400 mm. at the circumference. Each diffuser is composed of a cast-iron casing, in which are mounted 25 vanes arranged at an angle of 12° tangential to the periphery of the fan.

The ventilator at the higher level is coupled direct (Fig. 3) to the shaft of a simple triple-cylinder engine, the diameter of the cylinders being 160 mm., and the throw of the piston 140 mm. The second fan is driven by belting (Fig. 4) from the flywheel of a single-cylinder horizontal engine, diameter of cylinder 280 mm., piston stroke 400 mm., ratio of transmission 1 : 19. The smaller fan cost 13,970 marks (\$3,490) and the larger one 18,828 marks (\$4,700), inclusive of mounting; the average working expense, including motive power, for both fans amounts to 6.50 marks (\$1.55) a day.

The Deutschland Mine covers 4,127,260 square metres, divided into two sections by a northeast to southwest fault. There are four workable seams, served by five shafts, of the following depths: Nos. 1 and 2, 300 metres; 3, 180 metres; 4, 196 metres, and 5, 120 metres. Of these only No. 1, acts as an in-draft shaft, the others all serving as upcasts, Nos. 2 and 3 being heated by steam pipes, and No. 5 by the introduction of partially-cooled blast furnace slag, which is used for packing the worked-out seams. The average temperatures of these upcasts are: No. 2, 22° to 23° C.; No. 3 and No. 5, 18° to 19° C. No. 5 shaft is not heated, and, being cooled by descending water, has a tendency to act as an in-draft shaft.

The two ventilators in use in No. 1 shaft are both mounted at the 225 m. level. One of them is a Mortier fan 2,100 mm. in diameter and 1,400 mm. broad, and is driven by a single-cylinder horizontal condensing engine, the cylinder diameter being 580 mm. and the piston stroke 550 mm. The ratio of transmission is 1 : 3.7. The second fan is of the same type as that shown in Fig. 2, the sloping periphery having a diameter of 3,400 mm. on the one side and 3,100 mm. on the other, while the vanes are 700 and 400 mm. in breadth. This is driven by belting from a single-cylinder horizontal engine, with a cylinder diameter of 400 mm. and 700 mm. piston stroke. The ratio of transmission in this case is 1 : 2.08.

The high-level ventilator in the Schlesien pit, when working at a speed of 130 turns per minute, delivers 695 cubic metres of air, under a compression of 4 mm. water-gauge, the efficiency being 0.57 H.-P., or 1.39 H.-P. when the natural draft (5 mm. water-gauge) in the pit is taken into consideration. When the speed is increased to 150 turns the delivery is 910 cubic metres of air, the compression being 6 mm. and the efficiency 1.21 and 2.23 H.-P. respectively. In the case of the larger fan, when the mean speed of 133 turns is taken as a basis, the delivery is 1,300 cubic metres; compression, 14 mm. water-gauge; indicated H. P. of engine, 14; efficiency, 4.09 H. P., or in conjunction with the natural draft of the pit (6.5 mm. water-gauge), 5.92 H. P.

The Mortier fan in the Deutschland pit, when working at a mean speed of 264.2 turns, delivers 2,355 cubic metres of air per minute under a compression of 46.5 mm. water-gauge. In this case the indicated work of the engine is 91.1 H. P., and the efficiency of the fan 24.33 H. P., or 28.78 H. P., including the natural draft of the pit (8.5 mm. water-gauge).

The second fan in this pit at a mean working speed of 156 turns delivers 1,351 cubic metres of air, compression 50 mm. water-gauge, indicated horse power of engine 34.95, efficiency of fan 15.01, and 17.1 H. P. (natural pit draft 7 mm. water-gauge).

A considerable natural draft is produced in the Schlesien pit by the warming of the upcast shaft, the amount of air discharged from this shaft per minute being 1,176 cubic metres per minute when both ventilators are at a standstill, or 59 per cent. of the total volume (1,992 cubic metres) discharged when both fans are working at mean speed. This applies when the temperature of the incoming air is — 1° C., that of the upcast being 21° C., and when the initial tem-

*"Zeitschrift für Berg- Hutten- und Salinen-Wesen."

perature is still lower the natural draft suffices for ventilation without resorting to the fans.

The rate of air supply is based on a minimum requirement of 2 cubic metres per man per minute, each horse being reckoned as equal to four men. Allowance is also made for the presence of choke-damp and the prevalence of high temperature in various parts of the workings; hence in the Schlesien pit a total volume of air amounting to 2,163 cubic metres per minute is supplied, which, for the 514 men and 34 horses employed in the pit, works out at an average of 3.3 cubic metres per head. In the Deutschland pit, where 680 men and 35 horses are at work, the air supply per minute is 3,204 cubic metres, or 3.6 cubic metres per head.

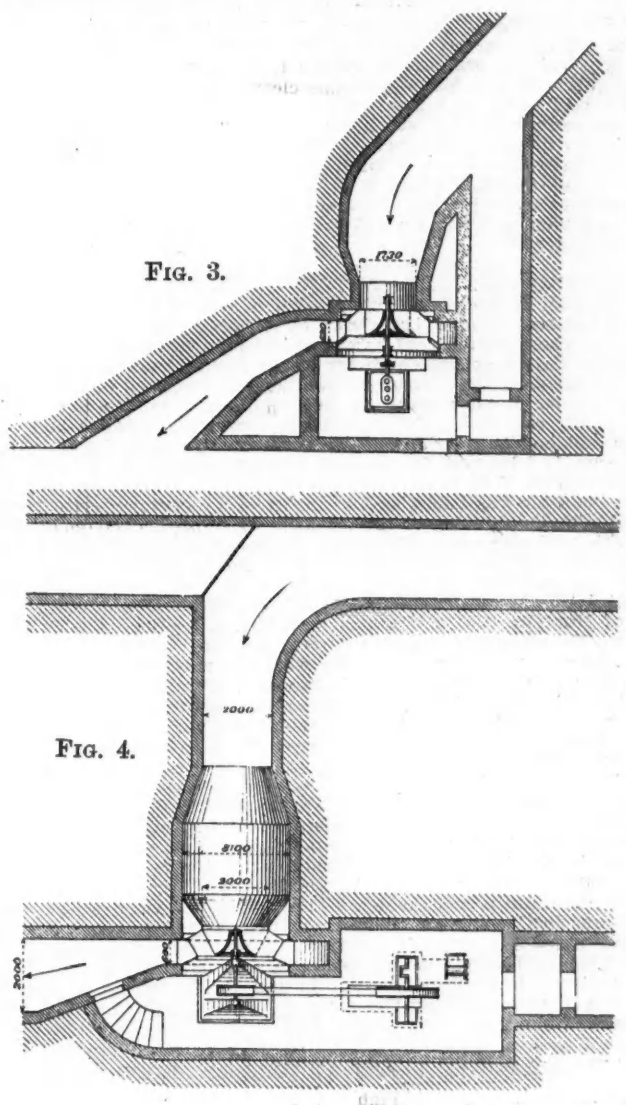
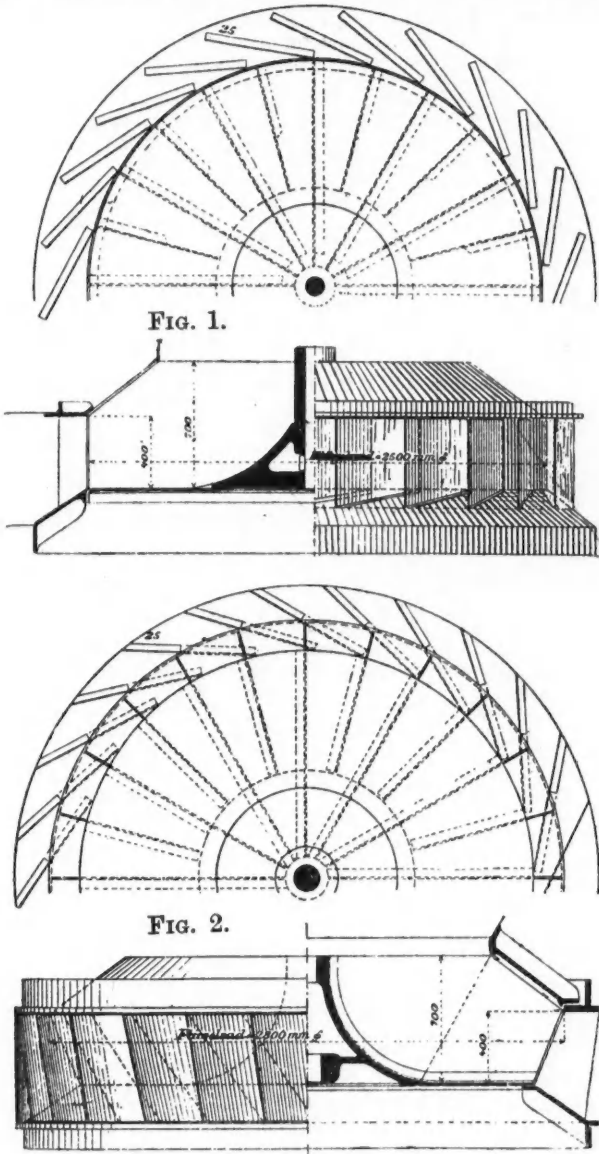
Previous to the introduction of these fans at the Schlesien pits the work often had to be interrupted for days on account of the great influx of carbon dioxide into the workings, an inconvenience which has since disappeared. From various circumstances it seems probable that in the workings, both in the lower and upper seams, there is a direct communication with the external air through various fissures in the cover rock, most probably due to subsidences; since

that the compression prevailing in this pit is insufficient to lead to any waste through rock fissures; but, on the other hand, the use of exhaust fans, by increasing the degree of depression would in all probability lead to an inrush of foul air through the crevices evidently in existence. Consequently, compression ventilation is the ideal system under the prevailing local conditions.

From similar measurements made in the Deutschland pit, where the compression is higher, it appears that a loss of air through leakage into fissures occurs, some 300 to 500 cubic metres of air per minute being wasted in this manner; and, in fact, a brisk flow of air into the fire zone of the pit is noticeable.

An objection frequently urged against compression ventilation, namely, that by partially ventilating the surrounding strata it increases the danger of pit fires, seems to the author to apply equally to ventilation by exhaustion; and, certainly, the fire risk in the two pits now in question has diminished since the introduction of the former system.

Another objection raised is that the fans must usually be mounted underground; but this plea is only justified when the downcast shaft



COMPRESSION FANS FOR COLLIERY VENTILATION.

otherwise the spontaneous fires in the pits in this district would be extinguishable much more rapidly than is found to be the case. Furthermore, evolutions of choke-damp at the surface are occasionally experienced, and the fumes of a pit fire have been distinctly detected in a cellar attached to the buildings on the colliery premises.

Whether these fissures are of sufficient magnitude to lead to a waste of air-current cannot be definitely ascertained, but observations made at the Schlesien pit appear to negative this assumption—at least, under the ordinary conditions of working the ventilators. The measurements made show that the initial compression is too small to extend throughout the workings, and that, owing to the suction exerted by the upcast, a depression zone is formed, the relative area of which varies, decreasing as the external air temperature rises, and vice versa, so that in Winter the ventilation is almost entirely affected by suction, while in Summer the bulk is done by compression. From these conditions it follows that any important connection with the outside air by way of fissures would result in the contamination of the air within the zone of depression by choke-damp, especially in Winter; whereas, actually, the composition of the air in the workings is uniformly favorable throughout the entire year. It thus follows

and intermediate channel leading to the intake of the fan are not themselves thoroughly fireproof. In cases, however, where all the fittings except the wooden cage guides are of iron, and consequently a shaft fire is as good as impossible, he believes no disadvantage can accrue from the ventilator being situated in the workings.

In an outbreak of fire in a pit it is of the highest importance that the ventilator should be easy of access, since circumstances may arise that render it imperative to either stop the fan or reverse its motion. For this purpose the arrangement of the ventilators close to the winding shafts must be regarded as the most suitable plan, since their accessibility is greatest in this situation. Exhaust fans, on the other hand, are frequently erected in air shafts at some distance away from the winding shafts, and therefore cannot be got at so quickly; and when fitted in winding shafts these fans must be situated underground, unless provision be made for keeping the shaft closed. This mode of arrangement must be classed as dangerous, owing to the inaccessibility of the ventilators during an outbreak of fire.

Another advantage of the compression system is that, during rescue work and other labor carried on while a pit fire is in progress, the rescue parties, etc., can work with a greater feeling of security, know-

ing that the air supply is being maintained behind them, and that the way of escape is kept open thereby. Moreover, in pits where communication with the surface exists through cracks and fissures, compression ventilation is to be preferred to exhaust systems, the advantage increasing in proportion to the degree of compression produced.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

DEDUCTIONS TO BE MADE WHEN PROFITS FORM THE ROYALTY.—In ascertaining the amount due under a covenant, in a lease of gas land, to give one-fourth of the profits of all gas "conducted off the premises, for use or sale," above the costs, all expenses, including costs of pipes and materials, and payments for right of way and for employees' salaries, are to be deducted from the sales. And gas used by the lessee should be charged for at same rates as if sold to others.—*Akin vs. Marshall Oil Company* (41 Atlantic Reporter, 748); Supreme Court of Pennsylvania.

FELLOW-SERVANTS OF MINERS.—A gas-tester, whose duty it is to ascertain the existence of noxious gases in the mine in places where miners are required to work, and to warn them of the same, and who has no other authority, is a fellow-servant of the miners. An outside or top-boss of a coal mine, who has charge of receiving the coal when brought to the surface, and of lowering material for the miners into it, without authority to employ or discharge men or to take charge of any department, is likewise a fellow-servant. A person located on the outside of a mine, and operating a fan by which the mine is ventilated, and possessing no other authority, is a fellow-servant of the miners.—*Hughes vs. Oregon Improvement Company* (55 Pacific Reporter 120); Supreme Court of Washington.

EVIDENCE THAT MUST BE CONTROVERTED IN A DAMAGE SUIT.—At the trial of a damage suit against a mining company the plaintiff, who had been injured, had shown by evidence that the timbering in the place where the accident happened had been insufficient; that he had reported the dangerous character of the ground where he was working to the agents of the company; that they had promised to watch the place and timber it when necessary, telling him it was safe and to continue at work; and that, relying on these representations, he had stayed there and had been injured. The court on appeal held that a prima facie case had been made out, and it must be rebutted by evidence of the company. The court held, however, that the fact that the foreman was inebriate was inadmissible, unless such fact was shown to be connected with the causing of the accident, or of negligence on his part chargeable to the company.—*Miller vs. Bullion-Beck & Champion Mining Company* (55 Pacific Reporter, 58); Supreme Court of Utah.

MONTANA LAW RESTRICTING CONVEYANCES BY DIRECTORS.—The law of Montana (Comp. Statutes 1887, Div. 5, Sections 492-294) providing that the officers of a mining corporation shall have no power "to sell . . . or otherwise dispose of" the whole or part of its mining grounds, mills and plant, without such transfer being first approved by the holders of two-thirds of the stock, at a meeting at which at least three-fourths of the stock is represented, and that, if such sale be of the entire corporate property, the corporation shall be dissolved, is merely a limitation of the common law powers of directors and majority stockholders of a corporation, and does not authorize two-thirds of the stockholders of a prosperous company to sell all of its property against the protest of the other stockholders, or any of them.

A transfer of all of the property of a corporation to a foreign corporation organized by the directors of the former to acquire its property, in consideration of the latter assuming its liabilities and agreeing to deliver to it its entire stock, stockholders of the former to exchange their stock for shares in the new company, or in lieu thereof to recover a fixed sum per share for surrendering them, is neither a sale nor an exchange, within said provisions, conceding a sale or exchange to be authorized by such law.—*Forrester vs. Boston & Montana Consolidated Copper and Silver Mining Company* (55 Pacific Reporter, 229); Supreme Court of Montana.

THE ELECTRIC POWER PLANT AT HELENA, MONTANA. *

The plant of the Helena Water & Electric Power Company is situated at Canyon Ferry, on the Missouri River, 18½ miles from Helena, Mont. A timber dam was constructed, giving a 27-foot head. At one end of this dam a heavy stone embankment was built, and within this structure the penstocks are imbedded. The penstocks enter the power house at the side facing the cliffs, and in order to accomplish this very sharp turns had to be made.

The power house is a stone structure. At present it contains four 750-K. W. Westinghouse generators, which are direct-connected to wheels manufactured by the Dayton Globe Iron Works, of Dayton, O. These machines operate at 157 revolutions per minute, and deliver 550 volts to the bus bars. The fields of these machines are excited by two 100-K. W. 120-volt generators, direct-connected to two smaller wheels of the same make as the above. The switchboard is of marble, on the face of which are mounted the necessary switches and measuring instruments, together with synchronizing devices.

The transformer house is about 50 ft. distant from the power house, and contains eight 300-K. W. step-up transformers. The initial voltage is here transformed to 10,000 volts. Current is transmitted to the various smelting and other plants by means of four circuits of No. 1 wire. The pole line is remarkably well constructed, and went through the late terrific weather without any hitch or interruption.

Situated 13 miles distant from the generating station is the plant of

the Helena Smelting & Refining Company. Current is used for crushing, hoisting, etc.; in fact, wherever motors can be used to any advantage, the work is done by that means. In Montana, where labor is expensive and scarce, this item is a great factor in production. The blast for the smelters is furnished from two 36-in. air compressors, which are driven by two 175-H. P. type "C" Westinghouse induction motors. The sampling works, where all the grinding and crushing of ore preparatory to roasting is carried on, are operated by one 100-H. P. type "C" induction motor. It is remarkable that this motor has been carrying a continuous overload of 225 horse-power since the plant was started, on October 6th last. In the pump house of these works are two direct-connected pumps for fire purposes, and to furnish water for general use, connected to one 100-H. P. and one 20-H. P. induction motor of the same make, respectively. These motors have already demonstrated their efficacy. The machine shop and blacksmith shop are provided with one 20-H. P. motor each, to perform the various work necessary. The ore is hoisted to the crushers by one 50-H. P. motor, which also operates line shafting to hoist the ore to the smelter. In the roasting department the 20-H. P. motor is attached to a very ingenious contrivance which moves the ore from one section of the furnace to another. This contrivance was designed by Mr. Hickson, the mechanical superintendent of the smelter. This motor relieves nine men from work which is very laborious, and in the summer time almost insufferable. The residence of the manager, and the various offices and sleeping apartments of the members of the staff, are lighted by this plant, and the heating of the building is also derived from the same source.

It is interesting to know that since the introduction of motor power for the air compressor on this plant, the number of heats on each 12-hour shift has been increased from 45 to 64.

Two miles northeast from this plant is situated the concentrator of the Helena & Livingstone Company. This plant is used to concentrate the ore preparatory to delivering to the smelter. Most of the machinery in the building was designed and is owned by the superintendent of the plant. It is sufficient to state that the plant is wonderfully complete in all its details. The grinders, six in number, and hoists from the ore bins, are operated by a 500-H. P. type "C" Westinghouse motor. The Peck concentrators, which are the chief feature of this institution, are connected by a line shaft to another 500-H. P. induction motor. The high rate of speed at which it is necessary to run this machinery rendered it necessary to introduce some special features which made the demands on these motors specially severe. However, the plant is operating with great regularity. The hoisting of the concentrators is performed by means of two 20-H. P. induction motors, and the pumps by one 30-H. P. and one 20-H. P. motor respectively. The works are lighted from the same transformers which furnish the power, and altogether the plant is very well provided in the way of current.

The plant of the Helena Light and Power Company is situated about 18½ miles from the generating plant. At this point there are six 150-K. W. transformers, from which are operated the lighting circuits which furnish light to the city of Helena. The high-tension voltage of 10,000 volts is transformed to 1,100 volts, which is run to bus bars. From these bus bars each circuit is connected. In one leg of each circuit is a 10-per cent. Stillwell regulator, which takes care of any slight inequalities in regulation. The street railway in Helena is operated by two 175-K. W. rotary transformers. Since the introduction of these rotaries the service and the operation of the road have been wonderfully improved. The arc machines are connected to a line shaft, on each end of which is a 100-H. P. induction motor.

All of these plants are protected by Wurts non-arcing metal lightning arresters.

STEAM AND ELECTRIC MINE LOCOMOTIVES.

In the accompanying illustrations Fig. 1 shows a mine locomotive built by the Baldwin Locomotive Works in Philadelphia for the Lehigh Coal and Navigation Company. The engine is of the four-wheel type with saddle tank, built for a track of 42 in. gauge. The limit of height is 5 ft. 7 in., and of width 5 ft. 4 in., making necessary some peculiarities in design.

The cylinders of this engine are 9 in. in diameter and 12 in. stroke. The driving wheels are 28 in. in diameter; the total wheel-base is only 3 ft. 10 in., so that the engine can work around very sharp curves. The weight is 17,000 lbs., and all of it is carried on the drivers, giving an average of 4,250 lbs. on a wheel. The boiler is 26 in. in diameter and there are 54 tubes, 1½ in. diameter and 6 ft. 10½ in. long. The firebox is 30 in. long and 25¾ in. wide, giving a grate surface of 5.39 sq. ft. The saddle tank carries 215 gals. water.

In order to adapt the engines to the narrow limits of the mine galleries, it was necessary to use slab frames and inside cylinders, with rods connected to a crank axle. The gauge being 42 in. and the limit of width 64 in. leaves only 11 in. on each side from the gauge line to the limit of clearance. The locomotive is capable of hauling from 75 to 100 tons on a straight grade of 1 per cent.

Regarding cost of maintenance and operation, it is almost impossible to get definite data. From such as can be had it is estimated that, taking into consideration the low price at which fuel can be obtained at the points where these locomotives are operated, the total expense of operation, including repairs and interest, would amount to about ½c. per ton-mile of material hauled, say \$6 to \$8 per day, including wages.

Fig. 2 shows one of the latest locomotives designed and put up on the market by the Jeffrey Manufacturing Company, of Columbus, Ohio, is known as their T. M. 110 electric locomotive. A number of these locomotives have already been put into service. The first electric locomotive used in connection with mine work were very light, but the manufacturers have been building them heavier and heavier each year as the work they were called upon to do was increased. The locomotive shown is a distinctively new type and is claimed to be the heaviest and most powerful electric locomotive for mine haulage which has ever been built and put in successful operation. The weight of the machine is 15

*Abstract of article in the "Electrical World and Electrical Engineer."

tons and in getting this weight the most essential feature of such locomotive has not been lost sight of, that is compactness. Important improvements in electric locomotive design and construction have been developed. The distribution of weight in the design of a locomotive will determine largely the size of rail upon which it is necessary to operate it, and therefore affect to a large extent the cost of laying track. Few mines in this company are equipped with rails weighing more than 35 lbs. to the yard. In all the heavier locomotives built heretofore it has been the custom to use four drivers, but in this type three sets of

The operator's seat is located in the center of the car between the axles, where he is fully protected from injury in case of accident. The trolley pole can be located on either side of the frame of the locomotive. The sand boxes are cast in the frame and the supply of sand can be regulated by a positive motion operated by levers. The brake is of the automatically locking, equalizing screw type of such strength that the drivers can be slipped, if necessary. The top of the locomotive is covered, over its entire surface, save the operator's seat, so that water dripping from the mine roof, falls of slate, and other foreign sub-

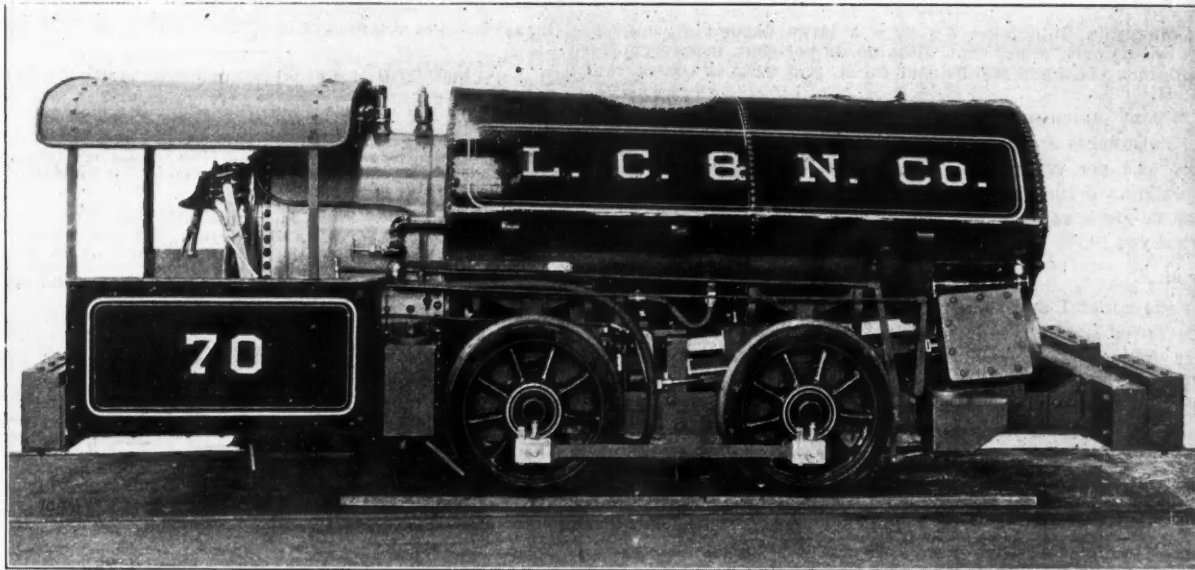


FIG. 1.—BALDWIN MINE LOCOMOTIVE FOR LEHIGH COAL AND NAVIGATION COMPANY.

wheels and axles are used, making six drivers in all, upon which is distributed the weight of the locomotive. The frame of the locomotive is mounted on equalizing springs arranged on the four-point suspension system. By this arrangement a proportionate amount of the weight is at all times distributed upon each driver and, consequently, the maximum tractive force is obtained continuously. The middle axle being fitted with smooth faced drivers instead of flanged wheels it is possible to operate this form of locomotive on tracks where curves of small radius are frequently encountered. On each one of the three axles is mounted a motor of proper size and capacity, and by thus distributing the power among three motors it is possible to build a locomotive for a much narrower gauge without sacrificing either efficiency or simplicity. The frame is of the best gray iron castings securely fitted and bolted together with turned bolts and reamed holes. The wheels are of the best chilled gray iron, this form of wheel having been found more serviceable and economical for electric locomotives in mine use, than the earlier type of tired wheels. These wheels are mounted on axles of hammered steel. The motors are of the multipolar, iron clad type, completely enclosed and fully protected by the motor casing

stance are not permitted to fall into the working parts. This whole top is so hinged that it can be easily removed when it is necessary to gain access to any of the motors, gears or other parts of the machine. There are only three pinions and three split gears on the machine, the pinions being keyed to the armature shaft and the split gears to the axles. The construction of the locomotive as a whole is of the utmost simplicity, consisting as it does of the wheels, axles, frame, three motors, and controller; each part being readily accessible without the removal of any of the other parts.

SALT IN PARAGUAY.—United States Consul Ruffin writes from Asuncion, under date of December 16th, 1898: "There is an excellent opening for United States capital in the salt mines situated 6 miles from the Asuncion market, along the Paraguay River, accessible to boats for shipment. The extent of the deposit I am unable to state. I think, however, that 100 wells could be bored and the supply would be ample for a large establishment. At present, the mine is worked by one man and a little boy. There is no machinery for refining; only a rude evaporating pan about 3 by 9 ft., and an old-fashioned well about 9 ft. deep

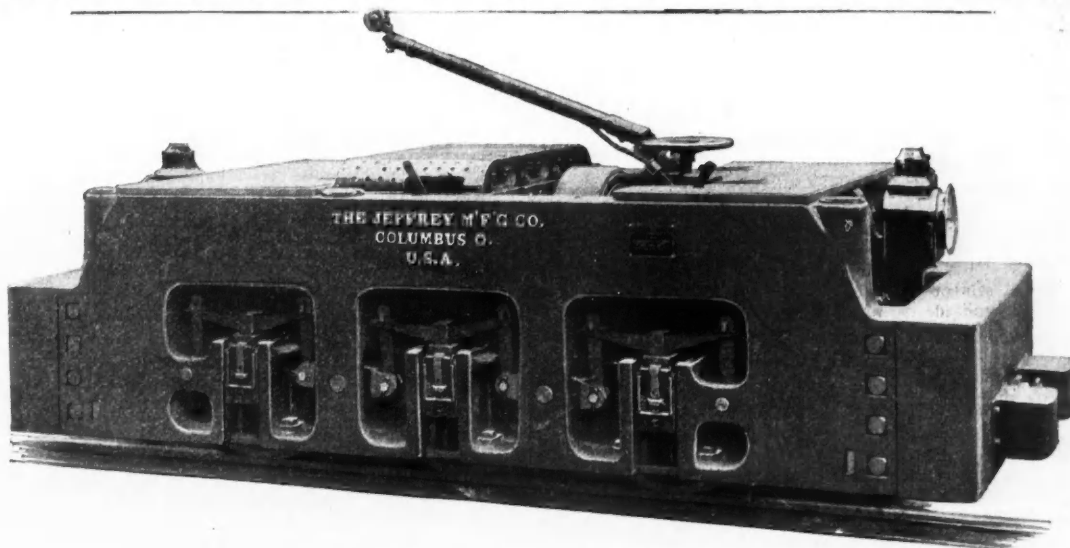


FIG. 2.—JEFFREY ELECTRIC MINE LOCOMOTIVE.

They are waterproof and of a type specially adapted for this class of work. The controlling mechanism is one of the special features in the Jeffrey locomotive, the number of steps in the controller being sufficient to admit of the starting of a loaded train at a uniform acceleration without jerking. In connection with the controller is a series-parallel switch which will allow the motors to be run either in series or parallel according to the speed at which it is desired to move the load. All these parts, together with a reversing switch and sand box levers are conveniently located so the operator can handle them without difficulty.

and 3 ft. in circumference. The product is carried to Asuncion by ox carts, and there is a sale for all that can be produced. The many large estancias, or ranches, with their thousands of cattle, would create a good market for salt. Last year, about 3,828 tons of common salt were imported, the official value at the custom-house being \$23,035 gold, and the duty being 25 per cent.; of fine salt, some 17,116 lbs. were imported, the official value being \$814 and the duty 25 per cent. The concession for the mine can be bought for about \$4,000. I believe this investment would be profitable."

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.)

Alumina-Magnesia Sulphate.—We have a large deposit of mineral containing, by analysis, 20 per cent. alumina, 46 per cent. magnesia, 17.9 per cent. sulphur. Is there any market for it, and what is the current price?—W. H.

Answer.—Your statement is not sufficiently clear. You should say what other substances are present in your mineral. Those given only account for 83.9 per cent. of the total. You do not state in what form the sulphur occurs. Before any estimate of the value of the mineral can be given you should have a complete analysis made, showing just what you have.

Graphite.—I have a deposit of graphite, of some extent. Is there a market for the mineral, and what can it be sold for?—W. H.

Answer.—There is a steady demand for graphite, and a considerable quantity is imported. Prices vary considerably, according to the quality. The best Ceylon graphite brings as much as $4\frac{1}{2}$ ¢ a pound in New York; but lower grade and amorphous graphite sell down to \$19.50 a ton. The value of your deposit will depend upon the quality of the graphite and its freedom from impurities; upon the quantity you can supply; and upon the cost of transportation. The last is a very important point.

Titanium.—I understand that there are some new uses for titanium, but I cannot find out what they are. Can you tell me anything about the matter?—J. O.

Answer.—Only one new use for titanium has been suggested, and that is its employment as an alloy in making steel. So far that use is only experimental; and even if it should be successful the quantity of titanium required would be very small. The proportion required in titanium steel would be small, as in the case of tungsten and molybdenum steels, and the metal would only be used for a few purposes where an extremely hard steel is wanted.

Antimony Ore.—Is there a demand for any large quantity of antimony ore at the present time? What is the value of ore carrying from 30 to 50 per cent. of white oxide of antimony?—P. B. C.

Answer.—Antimony ore is in good demand, as the metal brings a high price and is selling well. In common with all the metals used in manufacturing, the consumption has been very good for nearly a year past. We are informed that ore carrying 50 per cent. white oxide will find a ready market. As to price, the ore is bought on assay and no general quotations can be given. Messrs. Mathison & Co., of New York, are the only regular buyers of the ore in this country.

Galvanized Sheet Iron and Steel.—1. Is there any simple method of detecting the difference between galvanized sheet iron and galvanized sheet steel?

2. Is either sheet iron or sheet steel treated by the Bower-Barff process on the market; and if so how do they compare with the galvanized sheets as regards durability and price?

Answer.—1. Galvanized sheets, whether of iron or steel, resemble each other very closely indeed. Probably the most ready way of distinguishing them would be by the fracture; that is by the appearance of the newly broken sheet. Even this would require an expert, as after all the difference between wrought iron and soft steel is not very marked.

2. Sheet iron and steel treated by the Bower-Barff process are not on the market, and it is consequently impossible to give any prices. Parties who use the process extensively inform us that thin sheet metal is not treated by that process, and they doubt very much whether it is practicable to do so.

Barium Salts.—Will you give me the uses for barium and its various salts; also the market and demand? Can you give me any work giving a treatise on its manufacture from the crude state, or refer me to any person for information?—W. J. R.

Answer.—For metallic barium there is no special use; it is one of the rare metals which has not been applied to any economic purposes. For the barium compounds there are various uses. Thus barium carbonate is used for decomposing objectionable sulphates in clay intended for the manufacture of tiles and fine work. Barium chloride is used for softening water for boiler use. Barium nitrate is employed in the manufacture of explosives. There is a moderate demand for these salts. Barium carbonate is found to some extent in native form, in the mineral witherite. The most common salt is barium sulphate—barytes—which is found in many places and is largely used as a

pigment and for some minor purposes. There are other salts, such as the peroxide.

There is no special treatise on the manufacture of barium salts, but information is given in several works on industrial chemistry. We may mention Thorp's "Outlines of Industrial Chemistry" (\$3); Blount & Bloxam's "Chemistry for Engineers and Manufacturers" (\$6.50); Valentine & Hodgkinson's "Practical Chemistry" (\$3.75). None of these books, however, can be called exhaustive on the subject of barium. As to chemists from whom you can obtain information, we can refer you to the advertising columns of the "Engineering and Mining Journal."

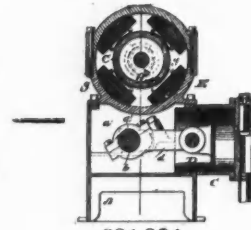
PATENTS RELATING TO MINING AND METALLURGY.

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 March 21st, 1899.

621,324. **COMBINED PUMP AND MOTOR.** Niels A. Christensen, Milwaukee, Wis. The combination of a frame carrying an oil-chamber, a shaft provided with a crank or eccentric inclosed in said chamber, a cylinder formed with or attached to said frame and opening at one end



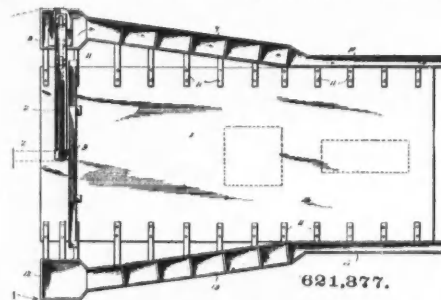
621,324.



621,348.

621,348. **SLIDE-RULE.** Willie L. E. Keuffel, Hoboken, N. J. A slide-rule composed of a plurality of parallel bars held in fixed relation to one another, a slide consisting of a plurality of parallel bars interposed between said former parallel bars, and a fixed connection between said parallel bars composing a slide.

621,377. **PLACER-MINING DREDGE.** George W. Sheppard, Tallapoosa, Ga. A mining-dredge comprising a barge or scow, hoppers supported at one end of the barge or scow exterior to the side lines or gunwales and on opposite sides thereof, sluiceways communicating with said hopper and inclined downwardly therefrom and toward the oppo-

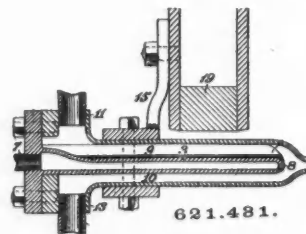


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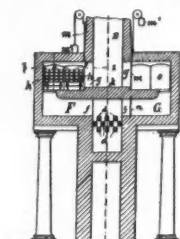
site sides of the barge, a pivotally-supported crane disposed intermediate the hoppers and movable about a vertical axis, an excavator-bucket mounted on the crane, mechanism connected with the bucket for raising and lowering the same, and tailings-sluices located at opposite sides of the barge or scow and communicating with, and at the same inclination as, said sluiceways, and said tailing-sluicest being narrower than the sluiceways.

621,408. **HYDRAULIC DREDGING-MACHINE.** Henry M. Guild, Erie, Pa. The combination in a hydraulic dredging-machine of a bed-plate mounted and capable of swinging back and forth on the deck of a boat, a turn-table mounted on said bed-plate, a trunnion mounted on said turn-table, suction-tube supporting and rotating mechanism on said trunnion, and mechanism for rotating said suction-tube.

621,431. **HYDROCARBON BURNER.** Patrick Sheedy and Thomas Carrick, Los Angeles, Cal. The combination of a chamber having an oil and an air inlet at one end and a burner-opening at its opposite end,



621,431.

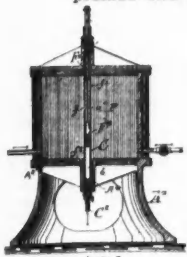


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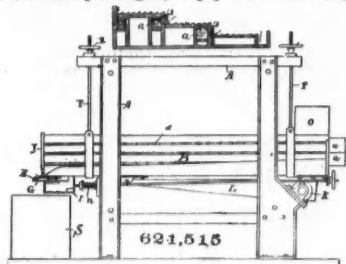
621,463. **KILN FOR CEMENT, LIME, ETC.** Friedrich Kuppel, Lagerdorf, Germany. The combination of a combustion-chamber with a charging-shaft communicating therewith, a charging device vertically movable within the shaft, a flue also communicating with the combustion-chamber, baffles contained therein, a pair of drying-

chambers, a roof within the flue which projects into each of the drying-chambers, and dampers between such chambers and the flue.

- 621,515. **ORE-CONCENTRATING TABLE.** Frank L. Bartlett, Canyon, Colo. A longitudinally reciprocating shaking-table having a series of laterally-inclined shelves provided with longitudinal riffles extending to the concentrate-discharge end thereof whereby the concentrated material is discharged at the end of each shelf, a separate water-supply for each shelf and means for conveying the unconcentrated material from each shelf except the last to the next shelf in the series.
- 621,523. **SECONDARY BATTERY.** Paul J. R. Dujardin, Paris, France. In a plate for accumulators of the lead-zinc type, in combination with suitable supports, conductors of small thickness arranged horizontally between said supports and provided with capillary openings adapted to retain mercury, means for maintaining a proper distance between said conductors and means for preventing the escape of the mercury.
- 621,536. **APPARATUS FOR LIQUEFYING AIR.** Oscar P. Ostergren and Moritz Burger, New York, N. Y. Assignors to the General Liquid Air and Refrigerator Company, of New Jersey. In an apparatus for liquefying atmospheric air, the combination of a condenser consisting of a closed vessel, two metallic sheets wound in parallel spirals forming two narrow passages, a pipe for supplying compressed and cooled air to one of said passages, a pipe for drawing



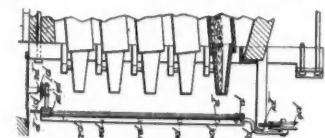
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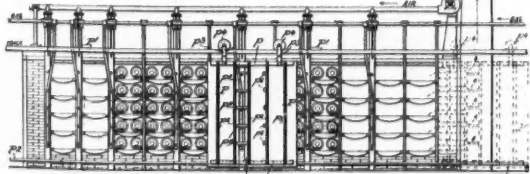
621,515.

off the expanded air connected with the other passage, a central air-pipe in said condenser provided with ports, means for opening and closing said ports, said means being adjustable and adapted to connect and disconnect said ports with the ingoing and outgoing passages, and means for drawing off the liquefied air.

- 621,537. **APPARATUS FOR LIQUEFYING GAS.** Oscar P. Ostergren and Moritz Burger, New York, N. Y. Assignors to the General Liquid Air and Refrigerating Company, of New Jersey. In a condenser for an air or gas refrigerating and liquefying apparatus, the combination of two spiral concentric channels, one arranged above the other in the same vertical plane, one of said channels arranged to carry the ingoing currents of aeriform fluid, and the other to carry the outgoing currents of expanded fluid, another spiral channel arranged intermediate of the coils of the first-mentioned spiral channels, and arranged to carry outgoing currents of further expanded fluid, a plurality of expansion-chambers with which said channels are connected, and connections between said expansion-chambers.
- 621,547. **MACHINE FOR CUTTING STONE.** Michel Thonar, Namur, Belgium. The combination of wire, a stretcher therefor, a post fixed on each side of the stone to be cut, a fixed pulley at the base of each post, movable pulleys above the fixed pulleys and adapted to slide in the posts, the wire passing over said fixed and movable pulleys and tending to pull the movable pulleys downward, and counterweights acting on the movable pulleys in opposition to the pull of the wire.
- 621,579. **BINDER FOR PULVERULENT MATERIALS.** Mark W. Marsden, Philadelphia, Pa. A composition of matter for a binder consisting of water, resin, flour and caustic alkali.
- 621,577. **FURNACE-SHIELD.** William Lanyon and Josiah Lanyon, Pittsburg, Kan. The combination, with a furnace, and an upper and a lower

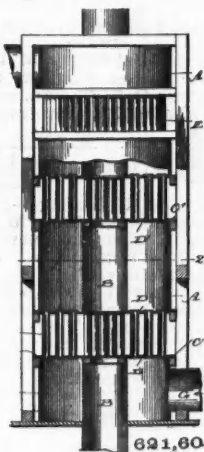


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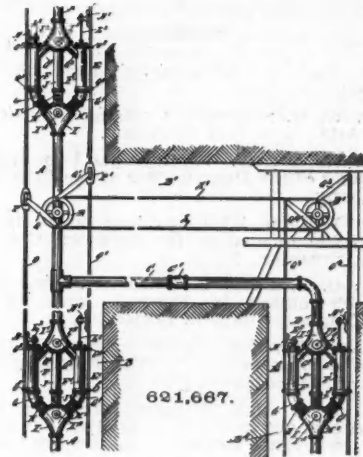


track arranged adjacent thereto, of a furnace-shield provided with rollers running upon the upper track and with inward-extending arms having rollers running upon the lower track.

- 621,608. **APPARATUS FOR MAKING SULPHURIC ACID.** Albert C. Johnson, Baltimore, Md. An apparatus for condensing gas, comprising a cooling-tower made up of a series of cylindrical receptacles, superimposed on one another, with intervening spaces, a series of open-ended tubes communicating between said receptacles and located in said spaces, central walled passage-ways through said receptacles.
- 621,646. **MOLD FOR STEEL INGOTS.** Henry L. Gantz, Fitchburg, Mass. A mold for steel ingots, having substantially the entire surface of its matrix-cavity composed of a number of longitudinal convex matrix-surfaces contiguous to each other.
- 621,667. **DEEP-MINE OR RELAY PUMP.** George S. Herbolshelmer, Denver, Colo. A deep-mine or relay pump comprising a series of pumps arranged in successive pairs at different elevations, a common water-main, each pair of pumps comprising two cylinders having suction and discharge connections with the water-main, a cut-off valve in each section connection, a by-pass for the main pipe having a cut-off valve therein, two power-transmitting rods extending alongside of the corresponding cylinder of each set, connections from said rods to the piston-rods.
- 621,679. **OXYANTHRAQUINONE SULPHO-ACID AND PROCESS OF MAKING SAME.** Max E. Isler, Mannheim, Germany. Assignor to the Badische Anilin and Soda Fabrik, Ludwigshafen, Germany. The process for the manufacture of sulpho-acid of oxyanthra-quinone by diazotizing amido anthra-quinone in fuming sulphuric acid and subsequent heating.
- 621,678. **METAL-DRAWING MACHINE.** John Illingworth, Newark, N. J. An improved rod-drawing device for metal rods, comprising a frame having slideways and at or near one end, rod-clamping means, a sliding grip for the rod arranged on said slideway a

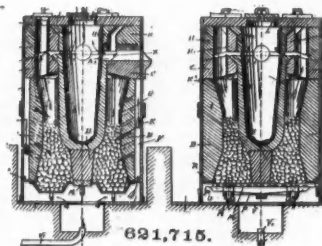


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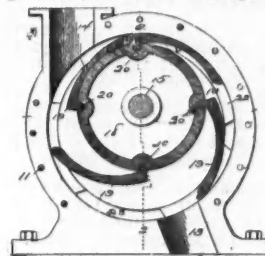


621,667.

- 621,696. **HYDROCARBON-BURNER.** Edwin G. Mummery, Detroit, Mich. Assignor to the Sun Vapor Stove Company, same place. A base provided with a vaporizing-channel, said base formed with an overflow receptacle communicating with the vaporizing channel, and means to close the outer extremity of said receptacle.
- 621,702. **MANUFACTURE OF SUBSTITUTE FOR EMERY-WHEELS.** Charles M. Pielsticker, London, England. Assignor to the Steel Abrasive Company, of New York. The process consists in purifying iron-sand, heating the purified iron-sand in the presence of carbon to redness, and then immersing the red-hot iron particles in cold water, on the top of which rests a thick layer of oil.
- 621,715. **FURNACE FOR SMELTING METALS.** Louis Rousseau, Paris, France. The combination with a smelting-furnace, a crucible-pot arranged therein, and means for supplying air laterally to the combustion-chamber, of a pair of trunnions secured one on each side of said furnace and mounted on sliding blocks, standards c adapted

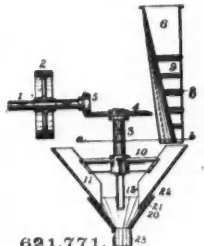


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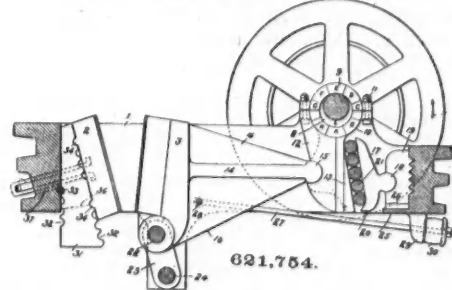


621,752.

- to guide said blocks, a sleeve fixed on one of said trunnions, said sleeve being provided with sockets; and a lever adapted to be engaged in said sockets, whereby the furnace may be oscillated on said trunnions.
- 621,728. **BRICK-MACHINE.** Robert A. Willett, New York, N. Y. Assignor to the Hercules Brick Machine Company, of New York. The combination of a stationary mold or row of stationary molds, a pair of rams for each mold adapted to compress the clay between them, and mechanism adapted to impart to the rams of each pair a plurality of distinct double-acting movements, and to change the position in the mold of the whole mass of clay under pressure, in each complete operation of the machine upon the clay, each double-acting movement being composed of simultaneous movements of both rams of the pair toward each other.
- 621,752. **ROTARY PUMP.** Robert F. Fleak, Stuart, Iowa. A rotary pump, comprising a cylinder having an inlet and an outlet opening therein, cylinder-heads each having circular grooves formed in their inner faces adjacent to the edge of the cylinder and concentric therewith, a cylindrical hub mounted for rotation eccentrically within the cylinder, a series of valves pivoted to the hub, of such length that when lying close to the hub they will engage each other, and having their outer surfaces shaped to conform to the interior of the cylinder and their inner surfaces to fit the exterior of the hub, two narrow segmental guides for each valve mounted in said grooves and having said valves pivotal thereto and of such a length that the ends of two adjacent guides will meet and form a water-tight joint when the valve is passing through the narrowest part of the cylinder.
- 621,754 and 621,755. **CRUSHING-MACHINE.** Clement F. Hinman, Chicago, Ill. The combination of a reciprocatory and oscillatory portion provided with an incline or wedge, the jaw to be propelled having a



621,771.



621,754.

- bearing at one side of said wedge and a rocking-abutment bearing against the opposite side and at all times extending to points on both sides of a line passing through the first bearing and the center of oscillation of said abutment.
- 621,771. **ORE-SAMPLER.** Charles A. Snyder, David J. Cheesman and John A. Moore, Boulder, Colo. The combination with a shaft rotating on an upright axis, a series of buckets carried thereby and having open mouths at their upper ends, and a hopper into which they deliver; of a chute delivering a stream of material substantially parallel with the shaft, its delivery end standing above the path of the bucket-mouths and being curved to conform with their movement, and a series of irregularly arranged bolts across the chute.

PERSONAL.

Mr. W. C. B. Allen, of Salt Lake City, is in Boston.

Mr. W. G. Scammel, a mining man of Prescott, Ariz., is in San Francisco.

Mr. Stillman W. Wheelock has been appointed manager of the Denver office of the Illinois Steel Company.

Mr. William Allen has been appointed general mine forman of the Scranton Coal Company, Scranton, Pa.

Mr. O. P. Posey returned last week from a month's outing in England, and has been spending some days in Boston.

Mr. Richard A. Parker was in Boston this week in consultation with the directorate of the United States Mining Company.

Mr. T. A. Rickard, notwithstanding the frequent changes in Colorado politics, has been re-appointed State Geologist for the third time.

Brig. Gen. Irving S. Hale, of Colorado, known as an authority on the application of electricity to mining, was wounded in the recent fighting before Manila.

Mr. Wm. M. Barr, of Philadelphia, known as the author of a standard work on pumping machinery, has recently engaged with the C. W. Hunt company, New York City.

Mr. Henry A. McCornick, of Salt Lake, has been examining mining properties at Placerville, Cal., and will inspect the Ivanhoe mine in Amador County.

Capt. J. D. Hosking has been appointed superintendent of the Franklin Mining Company's copper mines near Houghton, Mich., to succeed Mr. Graham Pope.

Mr. H. G. Murray, formerly with the Gwin Mine, in Calaveras County, Cal., has accepted the position of superintendent of the Lightner Mine, at Angels, Cal.

Mr. W. S. Ward of Denver, Colo., has been appointed first assistant in the department of mines and metallurgy of the American commission of the Paris exposition.

Capt. Joseph Sellwood of Duluth, Minn., will have general charge of the iron mining interests of the American Steel and Wire Company in the Lake Superior region.

Mr. W. B. Burtis, general manager of the Salmon Gold Mining Company, has gone to Salmon, Ida., to begin the season's work of his company on Buchanan Bar.

Mr. John Reis, formerly manager of Edith and Rosena furnaces of the Oliver & Snyder Steel Company, has been made general furnace manager of the National Steel Company.

Mr. Otto C. Burkhart, formerly connected with the staff of the "Engineering and Mining Journal," has been appointed superintendent of the Pennsylvania Steel Company's blast furnaces at Steelton, Pa.

Mr. John H. McLean, who has had charge of the Milwaukee office of the Oliver Iron Mining Company, has been appointed assistant superintendent in charge of the Norrie and Tilden mines, with headquarters at Ironwood, Mich.

Mr. A. F. Holden is in Salt Lake City, having returned from his Eastern trip. He has accepted the position of assistant managing director of the United States Mining Company. Mr. James W. Neill will be the company's general superintendent.

OBITUARY.

F. C. Clernow of Ottawa, Ont., died suddenly in Detroit, Mich., on March 26th. He was a member of the firm of Powell & Clernow, miners and dealers in mica.

Henry Bollinckx, of Brussels, Belgium, founder of the large machine works which bear his name, died at his home, Cureghem, Belgium, March 7th. He was 73 years old.

Thomas Molloy, who was connected with the salt industry in Syracuse, N. Y., for 38 years, died at his home in that city April 6th, aged 58. He was secretary and treasurer of the Onondaga Coarse Salt Association, receiver for the American Dairy Salt Company, Limited, and a large stockholder in a number of other companies.

Charles Davis died at Boulder, Colo., March 26th. He was a prominent mining man, having made a fortune out of the Golden Fleece at Lake City. Later he operated the Chingas Khan, in Boulder county, but was best known in late years as the owner of the Victoria Mine at Summerville, which he was working at the time of his death. He was 49 years old.

Richard A. Tilghman, inventor of the sand blast, died at Philadelphia, March 24th, after a

prolonged illness. He was born in Philadelphia in 1824 and studied chemistry after graduating from the University of Pennsylvania. He invented the sand blast, and with his brother, Benjamin C. Tilghman, established a large plant in Philadelphia for manufacturing the machines.

SOCIETIES AND TECHNICAL SCHOOLS.

Harvard University.—The plans of the new engineering building, to be erected out of the Henry L. Pierce bequest, will be completed in May. The building will be situated at the east end of Holmes Field, where "the willows" now stand. It will cover 16,000 or 17,000 sq. ft., and be about the same height as the Jefferson Physical Laboratory. There will be 10 lecture-rooms, for the general use of the university, and 2 large wings, for engineering laboratories and draughting-rooms.

INDUSTRIAL NOTES

At the Beaver Falls, Pa., mill of the American Steel and Wire Company, recently, 445,000 lbs. of steel rods, furnace weight, were rolled in 12 hours.

The Illinois Chemical Company is to construct a large plant at Chicago Heights, Ill. The buildings will be of stone, brick and steel, and will cost \$55,000.

The Shickle, Harrison & Howard Iron Company of St. Louis, Mo., has purchased ground in East St. Louis and is to erect a new steel plant thereon at a cost of \$275,000.

The North American Chemical Company, of Bay City, Mich., the American branch of the United Alkali Company, has increased its capital stock from \$600,000 to \$1,000,000.

The Anglo-Sicilian Sulphur Company, Limited, declared an interim dividend on the preference shares at the rate of 6% per annum for the half-year ended January 31st. It was paid March 29th.

The Fuel Economizer Company of Matteawan, N. Y., was awarded a contract for 1,000 H.P. of economizers, to be installed in the new plant of the Atlanta Consolidated Street Railways Company of Atlanta, Ga.

Fannie Furnace, at West Middlesex, Pa., which has been idle since 1896, will probably be ready for blast early in May. The stack will be operated by the Reed Furnace Company, and has a daily capacity of about 150 tons.

The American Smelting and Refining Company—the smelter combination—has filed its articles of incorporation under the laws of New Jersey. The capital stock is \$65,000,000, of which ½ is 7% cumulative preferred, and the balance common stock.

The Pressed Steel Car Company has received a contract from the Dominion Coal Company, of Boston, for 50 steel cars of 100,000 lbs. capacity each, and a contract for 1,000 large steel cars for the Lehigh Valley Railroad. The orders will aggregate about \$1,050,000.

Increases of 10% in wages have been given by the following iron and steel concerns: Jones & Laughlin of Pittsburg, Pa., Aetna Standard Iron and Steel Company's works at Aetnaville and Mingo, O., now owned by the American Steel and Wire Company, the Wheeling Steel and Iron Company of Wheeling, W. Va.

The Gillette-Herzog Manufacturing Company has purchased from the receivers the malleable iron business of the Walter A. Wood Harvester Company, at St. Paul, Minn., and will operate it as the Minnesota Malleable Iron Works, the Gillette-Herzog Manufacturing Company, proprietors. It will do a general business.

Chas. Mundt & Sons, New York manufacturers of perforated metals, have recently increased their plant to double its former capacity. Among the orders received lately was one for 1,700 32 in. by 32 in. perforated galvanized steel plates for the Hawaii Islands, for use in filter presses; also 19,000 sq. ft. of perforated steel plates for a large local house.

The Cleveland Car Company of Cleveland, O., states that it has been organized to build a complete equipment of industrial railways, including portable track rolling stock and accessories. A specialty of the company will be steel mine cars, for making which the company has especially designed machinery. J. W. Horuser and W. E. Ellenberg constitute the firm.

The Lewellyn Iron Works of Los Angeles, Cal., has just installed two of its "Mystic" rotary quartz crushers at the American Girls Mine, and one at the Garlock Cyanide Works. In addition, the company has completed several cyanide plants, including a 160-ton plant at La Fortina, Arizona, a 100-ton plant for the Iron Chief Mining Company, and a 60-ton plant for the Garlock Cyanide Works.

Adam Cook's Sons of New York City are manufacturing the original Albany Electric

Motor Grease for motors and journals. They state this lubricant is furnished in different consistencies, making it applicable to any motors in use. They claim for it better lubrication, better conditions of journals, and longer wear of brasses, and refer to many electric street railways they are supplying.

A \$12,000,000 combination to control the principal mineral paint producers of this country is reported. It is understood that a considerable number have given options on their plants, the following being reported: Prince Manufacturing Company, Alpha Paint and Mineral Company, New York Metallic Paint Company, Bass Paint Company of New York, Rutherford & Barclay of Philadelphia, and C. K. Williams & Company of Easton, Pa.

The Carnegie Steel Company, Limited, of Pittsburg, Pa., has posted notices at Edgar Thomson Steel Works, Edgar Thomson Furnaces, Duquesne Steel Works, Duquesne Furnaces, Homestead Steel Works, Carrie Furnaces, Lucy Furnaces, Keystone Bridge Works, Upper Union Mills, Lower Union Mills, stating that taking effect April 1, 1899, common labor will be advanced to \$1.40 per day; other labor in proportion. The advance averages about 12½% and affects about 10,000 workmen. It increases the company's payroll about \$400,000 a year.

The Schoenberger Steel Company has sold its plant to the American Steel and Wire Company for \$3,800,000, of which \$1,500,000 has been paid down. The final transfer will be made July 1st. The plant consists of 17 gas producers, 16 heating furnaces, 13 single puddling furnaces, 1 soaking pit, 4 annealing furnaces; 12 train rolls, 12 horse-shoe machines, 2 open-hearth furnaces, and 2 Bessemer converters, and has an annual capacity of 200,000 gross tons in steel plates, &c. A rod, wire and nail mill is under way. The officers are: C. L. Fitzhugh, President; J. Z. Speer, First Vice-President; G. A. Steiner, Second Vice-President; E. P. Loy, Secretary, and J. M. Brownson, Treasurer.

At the Conneaut docks of the Carnegie Steel Company a large amount of excavating has been done to give increased facilities for unloading vessels. The ore handling machinery includes on the west side of the river, 12 Brown and 6 King conveyors, and 12 McMyler rapid unloading machines. These are supplemented by 10 revolving derricks of the McMyler type and 8 more Brown bridges. The equipment installed on the east side of the river for the new docks will consist of a Hulett machine for direct unloading, and 19 McMyler and Excelsior "whirlies." An addition made the past winter is 4 Thew automatic steam shovels with 4-ton buckets, a trial of which has showed 50 tons of ore handled by 1 machine in 6 minutes. The Hulett machine for direct unloading on the new dock is expected to be finished by May 1st. It is manufactured by the Webster, Camp & Lane Machine Company, of Akron, O. On the east side of the slip also is a McMyler coal car unloader. Car-shifting on the docks is done by a rope haulage system driven by a 600 H.P. engine.

TRADE CATALOGUES.

Ray Hopping, Dey street, New York City, issues a 66-page catalogue and price-list of minerals. The catalogue is strongly bound in board covers, and contains a large amount of interesting information. Price-lists of separate specimens are given, as well as of students' collections, collection supplies, books, &c.

The Standard Silica Cement Company of New York City, manufacturers of "Sand Cement," publishes a 24-page pamphlet describing the process of making silica cement, and calls attention to the company's "Champion" brand. Some fine half-tone cuts show various buildings and public works in which their cement has been used.

"Briquetting" is the title of a neat little 14-page pamphlet issued by the Henry S. Mould Company of Pittsburg, Pa. The pamphlet treats of briquetting machinery and dryers, and gives a full description of the White briquetting press. This machine is built in three sizes (25, 50 and 100 tons capacity in ten hours), was described in a recent issue of the "Engineering and Mining Journal."

James Irving & Company of Los Angeles, Cal., gold refiners and assayers, issue a "Miners and Prospectors' Guide" of 156 pages that contains the United States Mining Law, the various State and territory mining laws and a large amount of valuable information regarding the characteristics of various metals, besides a number of rules and receipts of various kinds for millmen and engineers.

F. Ducommun of Los Angeles, Cal., publishes a 189-page catalogue of assayers' materials and mine supplies that would seem to justify his claim of carrying the most complete line of such goods in Southern California. The list includes glass and platinum ware, balances, crushers,

crucibles, furnaces, battery screens, chemicals, miners' hammers, tamps, and drill steel, compasses, thermometers and other instruments.

The Parke & Lacy Manufacturing Company of Los Angeles, Cal., manufacturer of riveted iron and steel pipe, publishes a 49-page catalogue describing its specialties and also various hydraulic supplies carried in stock, such as Chabot air valves, water gates and valves, &c. The pamphlet also contains useful tables and hints to users of pipe. The company states that it has the largest works of its class in Southern California, and is prepared to take large contracts for furnishing and laying pipe at short notice.

Catalogue No. 5, published by the Gates Iron Works of Chicago, describes the Gates improved crushing rolls. This catalogue is of the same high order of excellence as the others published by the company, the construction of the rolls being shown in detail by numerous half-tone cuts. The capacity of the three standard sizes are given with full directions for erecting, adjusting and repairing them. A cut of a mill in Utah and of another in South Africa show how wide is the field that the Gates Company supplies.

The Capitaine Motor is described in a 15-page pamphlet issued by the Capitaine Motor Company of Newark, N. J. This petroleum-burning engine is in extensive use in Europe and is now being introduced in this country. The advantages claimed for it are certainty of ignition, lack of vibration when running, automatic lubrication and a very sensitive speed regulator of novel design. All its working parts are within a dust-proof casing, and the engine is extremely compact.

High grade drawing instruments are described in an 18-page circular issued by the maker, A. G. Thornton, of Manchester, England. The instruments are furnished in cases, but can be had separately. The maker claims that in design, construction and arrangement the instruments are unsurpassed. Mr. Thornton also manufactures "Thornton's Pocket Rule for Engineers and Surveyors," for which he claims convenience, accuracy and durability, and deals in drawing-paper, ink, etc.

The Garvin Machine Company of New York City publishes a very compact catalogue of machine tools, including screw and milling machine and gear cutters. Full details of the various machines are given, and the company claims the highest standard of excellency and efficiency for its products. The milling machines are provided with feeds in all directions, controlled by a single lever and a change gear-box gives 18 different rates of feed. The various sizes will take anything from light brass work to heavy locomotive parts.

A 96-page circular pamphlet in attractive cover issued by the Garden City Fan Company, of Chicago, Ill., describes disk fans, exhaust fans, pressure blowers, hot blast apparatus, &c. A large variety of sizes in the different fans is offered, and their diameter, weight, speed, and price are stated. Some large fans for mine ventilation are also shown. Complete descriptions of the pressure blowers and hot blast apparatus are given. Steam traps, automatic vertical and horizontal engines, lumber and brick drying kilns and boring machines are described as well. The catalogue is an unusually complete one of its kind.

"Shaw Electric Travelling Cranes" are described in a substantially-bound and finely illustrated book of 93 pages that is published by the Shaw Electric Crane Company of Muskegon, Mich. The Shaw Company was the first to build cranes of the multi-motor type, and the firm's success has been due to adhering to this type and improving and perfecting details wherever possible. The cranes are made with speeds designed for the particular service called for, and are claimed to be extremely simple and accessible in construction and efficient and durable in use. They have been installed at many of the largest foundries and machine shops in this country. The catalogue gives full description, with many half-tone cuts. Manning, Maxwell & Moore of New York, Pittsburg and Chicago are sole sales agents for the company.

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.

ARIZONA.

Mohave County.

Wallapai Mining Company.—The old Juno mine, which is one of this company's properties, is sinking a 100-ft. shaft to cut a vein of ore known to exist. E. J. Loy, president of the company, is superintending the work.

Pinal County.

Old Dominion Company.—This company has re-elected the old board of directors, except that Joseph S. Bigelow succeeds Moses T. Stevens.

Tennessee.—The 120-ton concentrator is running steadily, and turns out about 20 tons of \$50 concentrates every 24 hours from second-class ore now on the dump from which the first-class ore has been assorted. There are 5,000 or 6,000 tons of this second-class ore on the dump. When ore direct from the mine is concentrated, the result is expected to be about 35 tons of concentrates every 24 hours.

ARKANSAS.

Marion County.

Big Buffalo.—This property, embracing 60 acres of ground 7 miles north of Yellville, is reported sold.

Morning Star.—This company has mined and sold 300 tons of carbonate concentrate, delivered at Buffalo City on White River.

CALIFORNIA.

Amador County.

(From Our Special Correspondent.)

Lincoln.—The shaft at this mine is down 860 ft. and a prospecting crosscut is being run north at the 500 ft. About 20 men are employed. The property is a half mile north of Sutter Creek.

Reward.—At this mine, on Clough's Ranch, the superintendent, Frank Walker, has a crew of miners at work running the tunnel and taking out water.

Butte County.

(From Our Special Correspondent.)

Golden Trout Mining Company.—This company is working a ledge from 2 to 7 ft. wide on the south fork of the Feather River, 4 miles from Lumpkin. On the east side of the river a tunnel has been run, and arrangements are being made to put in a stamp mill and a small saw mill.

Calaveras County.

Rose Hill.—At this mine, 1 mile southwest of El Dorado, the company represented by Louis Emery, has spent over \$60,000 in repairing the reservoir and constructing a ditch and laying pipes to bring in water. The water will be used not only for this mine, but to hydraulic the adjoining claim, which belongs to the company. Other property in this vicinity has been bonded and will be developed.

Kern County.

Little Butte.—J. H. Underhill, principal owner of this mine at Randsburg, has sold all of his interest in the property to William H. McEwen, of Los Angeles. About a year ago Frank H. Wilson of Montana took a lease and bond on the property. Up to the present time the mine has produced in all about \$130,000.

(From Our Special Correspondent.)

Kenyon.—At this mine, 1 mile northeast of Randsburg, 100 tons of ore from the dump, which was considered worthless, yielded a handsome profit, and the owners are to purchase a mill to work the entire dump.

Yellow Aster.—The new mill at this mine, just east of Randsburg, is running day and night, crushing about 130 tons per 24 hours. About 100 men are employed under ground, only 22 stopping ore, the balance being on development work.

Nevada County.

(From Our Special Correspondent.)

Bullion Consolidated.—Work has been resumed at this mine, 2½ miles south of Grass Valley, and a large force of men is at work under the management of George Mainhart. The ledge is supposed to be the extension of the Alaska. The property is 2 to 4 ft. wide, well equipped with machinery. The mine will be pumped out at once and sinking and drifting began.

Giant King.—This property, comprising 3 claims, 1½ miles south of Washington, is reported to have been bonded by a representative of eastern capital. The mine has been opened up by 2 tunnels, both of which show good ore, carrying from 1% to 3% sulphurets, mostly lead and iron.

Home.—The shaft at this mine near Blue Tent, has reached the 350 ft. level. The vein varies from 6 in. to 2 ft., carrying free gold. The 5 stamp mill is to start up this month, and will be kept running, as there is plenty of ore opened.

Kate Hayes.—The injunction suit filed against this company has been dismissed in the Superior Court.

Placer County.

(From Our Special Correspondent.)

Bear River Hydraulic Company.—The recent rains carried away sluices, concentrators and other machinery at this mine, 2½ miles north of Colfax.

Morning Star Mining Company.—This company has just declared the 100th dividend. The amount paid was \$2.50 per share, the smallest declared for a long time. The drift property is located at Iowa Hill.

San Diego County.

(From Our Special Correspondent.)

Elevado.—At this mine, 1½ miles south of Banner, owned by the Smoky City Mining Company, the development work consists of a tunnel 380 ft. below the main shaft, now in 200 ft. This tunnel will be continued about 500 ft., and as soon as it is finished the 10-stamp mill will be enlarged. The ore is said to average \$20 per ton.

Stonewall.—The cyanide plant at this mine, on Cuyamaca Grant, 10 miles south of Julian, has been completed. It will have a capacity of 300 tons of tailings per day and 20 men are employed. Strauss & Shin will operate the plant.

Shasta County.

(From Our Special Correspondent.)

Sam Houston.—Work on this mine in Dry Diggings, an extension of the Texas Consolidated, was progressing favorably until recently, when the shaftway became flooded. A good force of men is employed under the management of J. H. Moyten.

Sierra County.

(From Our Special Correspondent.)

Kenton.—On account of short power the mill and Burleigh drills are not run at the same time at this mine on Kanaka Creek, near Alleghany. The mill is run during the day shift and the drills at night; 20 men are employed.

Siskiyou County.

(From Our Special Correspondent.)

Gum Boot.—This mine, at the head of Mill Creek, 8 miles east of Scotts' Bar, has started up. A new 5-stamp mill has been erected and a boarding-house and bunkhouse has been built.

Trinity County.

(From Our Special Correspondent.)

Adelaide Mining Company.—This company has purchased through W. Kolman, of San Francisco, 2 properties comprising 260 acres in the Lewiston District, known as the Red Hill Hydraulic Mine, 1½ miles west of Weaverville, and the Sulphur Springs Cement Mine adjoining. On the former \$10,000 has been expended on flumes, electric light plant, &c. The gravel is 75 ft. in depth, averaging 20c. per cu. yd., and 15 men are employed working 2 giants. The water supply will be ample until September. At the Sulphur Spring mine a mill has been put in, having a capacity of 240 tons per 24 hours. The returns are about \$2.50 per ton. It is said that there is at least 250,000 tons of cement gravel in sight, with only ¼ of the channel exposed. The top gravel was hydraulicked off by Chinamen some time ago under lease.

Chloride-Bailey.—In driving the tunnel to crosscut the ledge at this mine near Junction City, the ledge was struck at a point between the 250 and 300 ft. below the present workings. The property is being developed by O. O. Howard, Jr., and F. E. Ware, of San Francisco.

Tuolumne County.

(From Our Special Correspondent.)

Alabama.—A large force of men under J. Gurius has been put at work at this mine 2 miles northwest of Quart Mountain.

Big Oak Flat Mining and Development Company.—This company has been organized with a capital of \$100,000 to develop property in the Big Oak Flat Mining District. The directors are: D. R. Shafer, J. H. Williams, of Big Oak Flat; C. W. Weaver and H. H. Castle, of Alameda, and H. S. Aldrich, of Oakland.

Bonanza.—At this mine, at Sonora, the big pump is taking water from the workings below the tunnel level. The mill is running from ore on the dump, but will soon be supplied from the lower levels.

COLORADO.

Boulder County.

Delano.—This mill at Boulder has started crushing, and the chlorination plant will start soon. Mr. Thos. R. Mann is at the head of the organization which has control of the mill, and Mr. T. L. Lammers, assayer for the former management, will be superintendent. The company will depend to a great extent on its own properties for ore.

Last Chance.—This mine is shipping ore to the mill at Wall Street.

Lucky Star.—This mine is working a force of about 20 men on double shift, drifting and stopping at the 130 and 180 ft. levels, taking out from 12 to 20 tons of ore per day, and making regular shipments to Boulder. The company has recently secured the old Boyd mill at Boulder, and is treating the milling ore there.

St. Louis.—This mine near Caribou is operated by A. C. Haberl. The shaft is now down 256 ft., and two levels have been run, at 150 and 225 ft., 100 ft. on each side of the shaft. The mine is in the gold belt, east of the iron dike that traverses the district. The vein is from 1 to 4 ft. wide, the smelting ore running from \$44 to \$300 per ton in gold and silver, a little less than $\frac{1}{4}$ of the value being in silver. The shipments of ore taken out in development during the last year have averaged, it is said, \$79 to the ton. No shipments have been made except from developments.

Ypsilanti.—This Caribou claim, recently purchased by Eastern parties, has a shaft down 60 ft., showing a vein 2 or 3 ft. thick with a rich pay streak. Hoisting is done by a gasoline engine.

Chaffee County.

(From Our Special Correspondent.)

Mayflower Group.—The Colonel Worth tunnel at this mine has reached the 100 ft. mark, and by 95 ft. in, a second vein has been opened.

Mountain King.—The electric plant at this tunnel is in operation. A gasoline engine runs a generator and a blower to supply air in the tunnel, which is under cover over 300 ft.

Sedalia.—The litigation resulting from the sale of this copper mine to H. L. Hollister et al. for \$150,000 is further entangled by an injunction brought in the district court by Helen B. McCormark and John C. McCormark, who accuse J. J. Henry and L. C. Ferree of conspiracy to deprive them of rights in the sale, especially in the division of a \$22,000 promissory note received. The distribution is temporarily enjoined by Judge Palmer.

Gilpin County.

(From Our Special Correspondent.)

Heavy falls of snow during the last week of the month of February have kept down the shipments to a considerable degree, and while it was expected that the heavy losses in the shipments of the first half of the month might be made up by the closing half of the month, such expectations could not be realized. Indications point to better weather from this on, and April month ought to be a large shipping month.

Mining Sales and Transfers.—T. D. Price to J. E. Kirk, of Denver, Colo., the I X L claim in Eureka District, for \$1200. S. Munk and W. G. Pomeroy to B. J. Wilson, of Huntington, W. Va., the Comstock Lode in Vermilion District, for \$250. C. Hesselbine to C. W. Deems, of Denver, half interest in the Fine Gold and Gibraltar claims in Russell District. C. Hesselbine to M. H. McCallum, of Denver, a one-sixth interest in the Cliff Lode in Quartz Valley District. B. H. Koch, of Chicago, to J. C. Jenkins, the Eclipse Lode in Pleasant Valley District. F. E. Norton to R. B. Duncan, of Denver, a one-quarter interest in the Drumlums, Penobscot, Harlacher and Dewey claims in Independent District, for \$1,500. E. W. Morse to Burkhardt & Coetal, a one-half interest in the Fortunata and Fortunata extension claims in the Hawkeye District.

Perigo.—A force of 45 men is at work, and the 20 or 25 rapid drop stamps of the new mill are treating about 75 tons daily, which will be increased to 100 tons daily in a short time. On account of the badly blocked roads in that section, the mill concentrates cannot be moved. The lessees on the Gold Dirt property will also run ore at the new mill, and ore from the Jim Blaine property is now being hauled for milling purposes.

Virginia.—Sinking operations have been resumed at a depth of 265 ft. Chicago capital is interested as the Crockett Mining Company, with B. J. Smith as manager.

Lake County.

(From Our Special Correspondent.)

Ore Shipments.—Shipments are still greatly curtailed. Snow has continued and prevented breaking many blockades. The Ibox, Resurrection and other gold-belt properties are still idle, and a number of big mines have been compelled

to reduce their forces more owing to lack of mine timbers.

A Y and Minnie.—Newton & Douglass, the lessees, have been compelled to close down owing to scarcity of timbers.

Ballard.—This new Breece Hill gold producer is preparing for heavy shipments as soon as the roads are better. The shaft is being sunk deeper and other development work completed.

Bi-metallic Smelter.—Franklin Ballou, vice-president and general manager of this smelter, says that the formation of the smelter trust does not mean the shut down of the Bi-metallic or Arkansas Valley plants at Leadville, as had been rumored.

Fanny Rawlings.—These people are opening up a good sized ore body and are shipping through the Big Four 30 tons a day of gold ore averaging 5 to 6% copper, for which the company gets \$2 a unit.

Gambetta.—Through the new Dix shaft small shipments are made.

Iron-Silver.—The output for March from the Moyer claim was 5,500 tons, an increase of over 1,000 tons over February. The present output is 150 tons a day, and will be increased as soon as the roads improve.

Leadville Pumping Association.—The Bon Air will soon be ready to resume pumping. In the meantime the Bohn, Penrose, Starr and Northern are handling without difficulty the surplus waters.

Maid & Henriett.—Owing to scarcity of timbers a number of leasers have been compelled to cease work, and others have been compelled to curtail their production, so that shipments have been cut down to 60 to 75 tons per day, a considerable portion of which is a low-grade carbonate from the Bower Henriett shaft.

Small Hopes Consolidated Mining Company.—Under the management of S. W. Mudd this company is engaged in diamond drill prospecting northeast of the R. A. M. shaft, in a section the lower horizons of which have never been systematically explored. The big ore bodies worked through the R. A. M. shaft open up larger, and although shipments are curtailed by the bad roads, 150 tons daily are being handled.

Valley.—A syndicate of Chicago capitalists has leased this property for 3 years. It embraces the Valley, Forest Rose and Dispute lodes on the gold belt, on the western slope of Little Ellen hill. Chicago and Cincinnati people are the owners of the ground, while the new leasing syndicate is headed by J. W. Gates, president of the Federal Steel Company, and H. C. Foote, vice-president of the Illinois Steel Company. A first-class surface plant is to be purchased and put in at once, and the shaft will be sunk 500 ft. to cut the gold ore shoot known to extend through this territory. The present Valley shaft is down 120 ft. with a 175 ft. incline from the bottom, and very good carbonate ore was shipped in 1893. C. T. Roberts, the western representative of the syndicate, will have charge of the new work.

Yankee Doodle.—This New York property operated by local lessees promises to be on the producing list again shortly with both lead and iron ore.

Park County.

Goldore Mining Company.—This company, incorporated under the laws of Maine, with a capital of \$1,500,000, divided into 300,000 shares, par \$5, is to try to float stock in the East. The property consists of the German, Little Pittsburg and Midland claims. The first two properties are patented, and the Midland is under lease deeds. Four well defined veins are said to be on the property. Ore shipped to Denver is reported to have yielded in car lots from \$30 to \$70 per ton, chiefly in gold. The ore is extracted by tunnels.

Teller County—Cripple Creek.

(From Our Special Correspondent.)

Beacon Hill District.—On the west side of this hill 3 leases are worked on the Kimberly property and 2 on the El Paso. Some work is being done by the El Paso Company, and several other prospects are being worked. On the eastern slope of the hill the Prince Albert, Gold Dollar and Mabel M., as well as several smaller prospects, are worked. Work is being pushed in the Standard Tunnel, which runs under Beacon Hill.

Damon Gold Mining Company.—The Alert Gold Mining Company, which is working part of the Diamond lode under lease, is pushing its new shaft with 3 shifts. The shaft is down about 140 ft. Some ore is being taken out in sinking. J. T. Mays is in charge of the work. The property of the Damon Company is on the north slope of Bull Hill west of the Isabella, in a region which until lately has produced but little ore.

Gold Coin Mining and Leasing Company.—At the Gold Coin mine as usual very little information is given out. It is understood, however, that shipments are as usual and the treasury

reserve is being increased. The mine is reported to have a large ore reserve and is undoubtedly one of the best mines in the Cripple Creek district. Most of the stock is held by the Woods Investment Company of Victor.

Independence Town and Mining Company.—Most of the present work on the Hull City Placer is development, although a little ore is being taken out. The large 3-compartment working shaft is now down 550 ft. The new hoister has arrived. In addition to the work done by the company, a lease is worked on block 13 by Whiting and others, who are taking out a little ore. E. M. Ray of Cripple Creek is the company's manager.

Ingham Consolidated Gold Mining Company, Limited.—At the annual meeting of the stockholders in Council Bluffs, Ia., the following directors were elected: Baron William del Mar-mol, Godfroid Victor Meer of Brussels, and William P. Bonbright and Irving Bonbright of Colorado Springs. The report of the manager showed that the output of the past year had been 2,579 tons of the value of \$69,484. Considerable sinking, drifting, crosscutting, &c., was done. The treasurer's report shows the total receipts to be \$70,539 and the expenses to be \$82,188, leaving a deficit at the mine of \$11,649. The deficit, including the expenses of the main office in Europe, was \$19,201, and the net deficit \$10,581.

GEORGIA.

Bartow County.

Peruvian Ocher Company.—This New York company, that has for 7 years been mining and preparing ochre, its mill being at Emerson, has gone into the hands of a receiver. The members of the firm are J. C. Oram, E. P. Earle and Mumford Martin. The business will be continued under the receiver.

IDAHO.

Boise County.

Pheasant & Bruiser.—H. L. Woodburn has several men at work on these gold quartz mines at Grimes' Pass, on Grimes' Creek. The 10-stamp mill, which runs by water power, was shut down for the winter, but will soon start. The veins are from 4 to 7 ft. wide, and the ore rich in free gold.

Twin Springs.—This company has several men at work cleaning out the ditches at Idaho City. Superintendent Woodburn states that he expects to commence piping in the East Hill claim very soon. The same company owns several hundred acres of good placer ground along Middle Boise River, and piping has already commenced in several of the company's claims there. The general manager is R. J. Anderson.

Owyhee County.

De La Mar Mining Company, Limited.—According to the report of Manager Huntley there were 4,072 tons of ore run into the cyanide vats in February assaying \$10.74 gold and 90c. silver, the tailings of which assayed \$2.80 and 60c. silver. The total return for the month was estimated at \$36,570, the operating expenses of \$30,505, leaving a net profit of \$6,065.

Shoshone County.

Blue Grouse Mining Company.—This Moscow company has made a second payment on the group of claims it has under bond for \$20,000 near Wallace. The group comprises 4 claims. W. H. Witham of Moscow is treasurer of the company.

Hunter.—There are now 12 men working on this mine at Mullan. The old compressor has been overhauled and other improvements are under way.

16 to 1.—Considerable excitement has been caused by reports of a rich strike on this claim near Wallace, owned by O. B. Oleson, J. W. Flink, O. H. Linn and Theodore Anderson. About a year ago these parties located 2 claims and a fraction, adjoining the Empire State on the west, calling them the Bi-Metallic Fraction, 16 to 1, and Ambitious. A tunnel calculated to cut the ledge 280 ft. deep cut the ledge about 3 weeks ago, and in cross-cutting concentrating ore was found from wall to wall with 15 in. of solid galena in one place. The streak of clean ore has widened to 3 ft. The news of the strike has led to a rush of prospectors to the place, though the snow on the ground is still 5 ft. deep.

ILLINOIS.

Vermillion County.

Catlin.—H. C. Adams of the Adams Coal Company, Chicago, has bought this coal mine and proposes to put in electric haulage and employ more men. The mine now employs 150. The territory contributory to the shaft is 1,000 acres of coal right.

INDIANA.

Coal Miners' Contract.—The miners and operators of the bituminous field came to an agree-

ment at Terre Haute last week, the miners agreeing to a bi-monthly pay-day and the new contract is to run for a year from April 1st. The rates for pick mining are fixed as follows: For yardage in entries 7 to 9 ft. wide, \$1.37. In entries of 12 ft. the price shall be 85½c. Wide entries shall not exceed 12 ft. Break-throughs in entries shall be at entry price. Room turning shall be \$3.30. Room-necks to be driven 12 ft. in and widened out up to an angle of 45°, when so desired. For machine mining yardage, entries 7 to 9 ft. wide shall be 98c. In entries 12 ft. wide, 61c. When the machine runners in 12 ft. entries are paid by the day, and entry is not sheared, the shooters and loaders shall be paid 2-3 of the yardage. Break-throughs between entries same as entry price. Break-throughs between rooms shall also be at entry price. Room turning shall be \$2.47½; room necks to be driven 12 ft. in and widened at an angle of 45°, when so desired by the operator. Any distance in excess is to be paid for proportionately. When room necks are driven 12 ft. wide the price shall be \$1.54½. Machine-cutting with punching machine, when paid for by the day, shall be, for cutter, \$2.35, and for helper \$1.85. The day-work rate for chain cutter machines shall be, for cutter \$2.35, and for helper \$2.11. A day's work shall not be less than 27 cuts. All cuts in excess of 27 shall be paid for proportionately. When paid for by the ton, the price for machine-mined coal shall be ¾ of that paid for pick-mined, or 49½c. The price of blacksmithing shall be 1¼c. on \$1, excepting after chain machines, where no blacksmithing shall be charged.

The Pittsburg contract between the operators of the competitive coal fields and the United Mine Workers was reaffirmed, the above schedule applying to the Indiana fields.

KANSAS.

Linn County.

Zinc Ore.—A small strike of zinc ore, in some pits sunk years ago for lead ore, is reported from Pleasanton on the Kansas City, Fort Scott & Memphis Railroad. Further exploration is needed to determine the value of the deposit.

MICHIGAN.

Copper.

Winona.—The new steel frame boiler and engine houses are under way. There will be 4 80 H.P. boilers and a double drum 14x18 in. hoisting engine. The compressor has been set up.

Iron-Marquette Range.

Miners' Union.—All the miners in the Ishpeming iron mines, numbering nearly 4,000 men, were called out by the local miners' union on April 1st. A large number of the miners are not members of the union, and this movement is to compel miners to join the union whether they care to or not. Work was suspended in all the mines pending the outcome of the movement. The total number of miners belonging to the union at the time of the walk-out is estimated to have been but 900.

Queen.—On this group of mines at Negannee, which was idle most of the time for several years past, the company is now employing 150 men.

Iron-Menominee Range.

Mastodon Iron Company.—The Dober iron mine near Iron River, at one time worked by this company, is now owned by the Oliver Mining Company. At present 58 men are at work pushing development work. A drift 200 ft. long is in good clean ore. A new double skip shaft has been started. About 5,000 tons of non-Bessemer ore are on the stock pile, which will be increased to 10,000 tons by the opening of navigation.

MINNESOTA:

(From Our Special Correspondent.)

At the upper bay in Duluth, where the Duluth, Missabe & Northern road is now building a dock, there is 44 in. of heavy solid ice, and the continuous ice field extends for 150 miles east from Duluth. It will be surprising if navigation opens before the middle of May.

The sale of the 5 steel steamships of the Zenith Transit Company, of Duluth, to the American Steel and Wire Company for about \$1,250,000 carries with it a charter for carrying 300,000 tons of ore from Two Harbors for the Minnesota Iron Company at 60c. a ton, a job that will occupy the fleet for about half the season. No contract has been made for the balance of the year. The sellers, besides having received continuous dividends from the ships, sell at about 25% premium.

All the dock and other work contracted for is very far behind. The Duluth & Iron Range has a heavy penalty from its contractors for every day after May 1st that its new dock is incomplete, and it is now a sure guess that the entire dock will not be ready before July. There is a scarcity of iron, timber and all other material, and wages have advanced sharply.

The Duluth & Iron Range road is preparing to handle the shipments of 4,250,000 gross tons of ore this short season, or about 1,500,000 tons more than ever before. If the new dock is complete in time there will be no difficulty so far as the road is concerned, but as to the mines.

The sale of the West Duluth blast furnace has been closed by J. M. Thomas and associates, of Niles, O., in June. The furnace has a capacity of about 50,000 tons a year, but by enlargements it may produce 75,000 tons. Coke will be brought from away, but coke ovens are in contemplation.

Iron-Mesabi Range.

(From Our Special Correspondent.)

Bailey.—Diamond drills have been put at work on the W. T. Bailey 40, adjoining the Sauntry at Virginia. There is a deep pit on the Sauntry, but 40 ft. from the line.

Biwabik Iron Company.—Stripping will begin soon by the Drake Stratton Company. It is probable that Biwabik's shipments this year will reach as near 500,000 tons as roads and ships can handle.

Commodore Mining Company.—This mine is now pumped out and mining will begin. The output this year is expected to be about 100,000 tons.

Franklin Mining Company.—This mine has again been examined by possible purchasers, this time by W. J. Rattle and others, of Cleveland. Report says it has been sold to the National Steel Company, but this story is doubted. The mine if sold will be worked heavily and may employ 300 to 400 men this year. It is in good shape. Its 200,000 tons last year were bought by the Consolidated Mines to fill sales.

Hale Mining Company.—Boilers and machinery from the Cincinnati are to be installed. The mine is leased at 10c. a ton to Harry Roberts, who represents Captain Sellwood, of the American Steel and Wire Company. A portion of the machinery from the Cincinnati goes to the Brotherton, Captain Sellwood's mine, at Wakefield, Gogebic Range, Mich.

Sauntry.—This property, belonging to the American Steel and Wire Company, is to be opened at once, large contracts for stripping having been made. The mine is about the last stripping proposition on the Mesabi Range, which probably accounts for its fancy price. Some 200 or 300 men will be employed.

MISSOURI.

Jasper County.

(From Our Special Correspondent.)

Joplin Ore Market.—The week ending April 1st was remarkable for the size of the output, considering a heavy snow storm and the bad condition of the roads. The price of zinc ore, maintained at the Association scale for 3 weeks, advanced \$2 for fancy grades above the Association scale. The opinion is freely expressed that the advance was for the purpose of discrediting the Missouri & Kansas Miners' Association as a factor in making prices. The fancy grade ore from the Eagle mines on the Standard Hill land at Belleville and the output of the Pleasant Valley mines at Carthage sold at \$45 per ton, and there was a general advance on all ores in the district of from \$1 to \$2 per ton. Lead declined 50c. per 1,000, selling at \$25.50.

During the corresponding week of last year, jack sold at \$26.50 per ton and lead at \$22 per 1,000, and the turn-in was less than for the week just closed by 4,587,410 lbs. of jack and 7,510 lbs. of lead, and the value was less by \$136,450. For the first 3 months of last year the turn-in was less than this year by 18,244,710 lbs. of zinc, greater by 4,089,400 lbs. of lead ore, and the value was less by \$810,633. As compared with the preceding week, the shipments show a gain of 973,940 lbs. of zinc and a decrease of 126,130 lbs. of lead, and the value was less by \$1,345. Following is the turn-in by camps:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	1,701,120	297,090	\$43,212
Webb City	536,780	40,810	12,945
Cartersville	1,213,750	208,560	30,200
Oronogo	1,049,310	10,320	22,536
Duenweg	775,450	.....	15,121
Central City	519,700	20,850	11,190
Stotts City	632,740	.....	13,604
Aurora	1,350,000	20,000	22,910
Galeana—Empire	3,330,000	294,100	74,106
Belleville	79,270	7,640	1,899
Hells Neck	61,460	.....	1,321
Carthage	66,000	.....	1,485
Wentworth	40,000	.....	800
Granby	284,000	9,000	4,641
Total for week	12,639,880	908,370	\$255,130
Total 13 weeks	127,535,540	11,588,790	\$2,535,722

United Lead and Zinc Company.—This Boston, Mass., company has purchased the Get There lease at Prosperity for \$90,000 spot cash. The reported selling price was \$150,000, but the property netted Col. Jas. O'Neill, the owner of

the lease, exactly \$90,000, and it was cheap, viewed from its record and the small amount of the ground developed.

The United Lead and Zinc Company has been incorporated under the laws of New Jersey, with \$6,000,000 capital. It is stated that the company has thus far acquired leases on over 280 acres of producing land, and owns the fee to 1,014 acres of mineral land.

Chatham.—This 440 acres in fee simple and the lease of the ground at Cartersville are reported sold as well as the Centre Creek and 11th Hour ground. There is no doubt that all 3 of these leases have been practically sold to a big Boston syndicate, as heavy payments have been made an all 3 for options which are said to run 60 days. One of the most prominent mining engineers of the country has thoroughly examined the properties, and has undoubtedly secured for the people he represents the 3 greatest properties in the entire district. The price of the 3 properties is said to be \$1,500,000.

Boston-Duenweg Mining Company.—Colley & Company, of Boston, Mass., have purchased the property of the Duenweg Mining Company, and the company will be known as above hereafter. The tract comprises 70 acres and is practically new ground, the greater portion of the development work having been done in the past 14 months. Last February Colley & Company bought the fee of the 80 acres south of the Duenweg, on which Grounds & Irwin have a lease, and the combined property already produces about ¼ of the entire output of the district. The properties were purchased on the report of Mr. Frank Nicholson of New York.

According to published reports, Louis Duenweg of Terre Haute, Ind., says that he and his associates bought the mine he sold 5 years ago for \$40,000. The ground has paid \$80,000 in dividends, and was sold to the Boston company for \$200,000.

Three Friends Zinc Mining.—This company has filed articles of incorporation at St. Louis. The capital stock is 35,000 shares, par value \$1 each. The shareholders are mostly residents of St. Louis. It now owns the Three Friends Mine and has 160 acres of land adjoining under lease.

MONTANA.

Broadwater County.

East Pacific.—This property at Winston has been examined by Wm. Braden of Helena, Mont., and according to report is to be listed on Boston Exchange. The Thompson Investment Company of Butte, that has offices in New York, is interested. It is stated that the mine paid \$151,000 in dividends during the time it was worked by Robert Bell of Butte.

Deer Lodge County.

(From Our Special Correspondent.)

Prize.—This Granite Butte property, under the management of Superintendent Byrns, has kept its 10-stamp mill running all winter, and deposited a good-sized gold brick monthly at the Helena Assay Office.

Stonewall.—This property, in the Heddeleston district, has been under bond for the past 3 years to a Mr. Deckert, of Salt Lake. A tunnel 1,200 ft. long has been driven, and the property is being exploited as a copper proposition. The work has demonstrated that a concentrator can be operated at a good profit.

Granite County.

(From Our Special Correspondent.)

Granite-Bimetallic.—Ore is being hoisted from both mines. The big 100-stamp mill of the "Bi" is dropping full force. Lumber for the flume topping Burr Lake is being distributed along the route, ready to erect as soon as the snow disappears.

International.—This property, under the management of Peter Mussigbrod, has been a constant shipper during the winter. The shipments so far have paid for all development work.

Royal Gold.—Kennedy & Neal are working this mine under a lease, and are overhauling the 20-stamp mill. They have several hundred tons of ore in the bins.

Jefferson County.

(From Our Special Correspondent.)

Australian.—Owned by Farrell & Migeon, of Bridgeport, Conn., this mine, which has lain idle for several years, will again start up.

Gray Eagle.—Since the murder of Henry Dahlgren, part owner, this mine has been closed down, pending an adjustment of its affairs.

Hope.—The crosscut at the 600-ft. level has reached the ore body.

Wilber.—This property, situated in the Amazon District, is to be operated by Butte parties on bond and lease for \$20,000. It is owned by Bailly & Reeves, of Helena.

Lewis & Clarke County.

(From Our Special Correspondent.)

Jumbo.—This old producer is again on the shipping list. The second contract shows a fine body of silver-lead ore.

Whitlach-Union.—There are several thousand tons of low-grade gold ore on the dump, which are said to sample close to \$10 per ton. The New York owners have sold the dumps to C. A. Muffley, who has started to move it to the Shaffer mill.

Vawter.—This Dry Gulch property is being worked under bond. A body of lead carbonates has been encountered in a pocket in the lime which nets \$50 per ton.

Park County.

(From Our Special Correspondent.)

Byrum.—This Trail Creek coal property is now sufficiently opened up to produce 200 tons per day.

Livingston Coal and Coke Company.—The indications point to a permanent close-down of this property. For the past 2 years it has been operated under lease by Oscar James, who has become identified with the Carbondale Coal Mines at Castle Rock, Wash.

St. Julian.—This property, at the head of Emigrant Gulch, will have a new mill built as soon as the snow will permit hauling machinery. The ore carries a big per cent. of bismuth.

Silver Bow County.

Alice.—This mine at Walkerville, owned by Salt Lake parties, is giving employment to 225 men, including lessees, and the yearly output of milling ore amounts to about 25,000 tons, while from 5,000 to 6,000 tons of crude ore annually is shipped. At present the company is doing a large amount of prospecting work. Seventeen claims are embraced in the Alice group, and a large area of promising ground remains to be developed. The mine has been explored to a depth of 1,500 ft., while in the property there are over 40 miles of drifts, stopes, winzes and upraises, the work in hand at the present time being confined to the levels nearer the surface. T. W. Buzzo is superintendent.

Montana Ore Purchasing Company.—This company makes the following statement under date of April 7th: "The trustees of the company have declared the regular quarterly dividend of \$1 per share (\$80,000) payable at the New York office of the company on April 20th, 1899. Books close April 8th and reopen April 20th, 1899. This makes \$1,040,000 paid by this company in dividends since January 1st, 1895. The trustees further state that as long as copper remains above 14c. lb. the company will pay its dividends of \$1 per share monthly hereafter during the year 1899."

Parrot Silver and Copper Company.—At a meeting of the above company at 71 Wall street, New York, the following officers and directors were elected: Charles H. Dickey, president, Baltimore, Md.; Charles D. Burrage, treasurer, 24 West street, Boston; Horace A. Davis, secretary, 59 Wall street, New York; Richard D. Willard, Sidney Chase, Boston, Mass.; A. Migeon, Ansonia, Conn.; A. M. Holter, Helena, Mont. Standard Oil interests now control the company, owning 168,000 out of 230,000 shares.

Washoe Copper Company.—The tunnel being driven to tap Silver Lako to supply the proposed new smelter with water is reported to be going ahead very slowly on account of water and quicksand. It is reported that it may be abandoned and a new tunnel driven through the mountain in solid rock.

NEVADA.

Lincoln County.

Magnolia Gold Mining and Milling Company.—This company at De La Mar according to report, is shipping some very rich ore from a streak in the level 200 ft. below the tunnel.

De La Mar.—Assistant General Manager T. T. Oxnam of the mine and mill at De La Mar, is quoted as saying that the mill is running regularly and most satisfactorily, treating about 300 tons of good ore daily, and that the mine is steadily improving as work in its operation progresses. The dust nuisance associated with the operation of the Griffin mills has been overcome, and the application of a recent discovery has done away almost entirely with this feature of ore reduction. Mr. Oxnam also states that the company has just begun extensive development on the Flagstaff group, near the De La Mar, which is also owned by Capt. J. R. De La Mar.

NEW MEXICO.

Colfax County.

Beta.—This claim and the American Flag Extension near Elizabethtown have been purchased by O. K. Dorn.

Confidence.—Machinery for the new mill at Elizabethtown is coming, and its construction is being pushed.

Grant County.

Colorado Fuel & Iron Company.—This company is shipping from its mines near Silver City 200 tons of iron ore daily to the furnaces at Pueblo, Colo.

Santa Fe County.

Monte Cristo Mining Company.—This company at Golden has a placer outfit, consisting of a dipper dredge and washer. The plant can handle 1,000 cu. yds. in 24 hours.

Ortiz.—This mine, situated on the Ortiz Grant, a short distance from Dolores, is pushing development work. At present the shaft is a little over 400 ft. deep. The company has put in recently a new sinking pump, and 2 new Huntington mills, and is going to erect a battery of 10 stamps.

Socorro County.

Martin.—At this property near San Marcal the shaft is down 175 ft. A 10-stamp mill and 20-ton cyanide plant are busy.

NORTH CAROLINA.

Cherokee County.

(From Our Special Correspondent.)

Iron Mines.—Lack of transportation facilities has greatly retarded developments, but the railroads have now given a rate of \$1 per ton to Middlesborough, Ky., to the Cherokee Iron and Marble Company, and a shipment of 1,000 tons is being made to the Watts Iron and Steel Syndicate. The ore is non-Bessemer and runs high in silica. The deposit is known as the "hill lead." Along Valley River is another belt carrying ore which at times contains quite a percentage of manganese. North of these belts is one of crystalline limestone, and along its foot-wall are deposits which furnish ore as high as 63 to 67% iron. The ore is firm, but open and easily smelted. Some leases have been secured upon a royalty of 10c. per ton.

PENNSYLVANIA.

Anthracite Coal.

Dorrance.—At this colliery at Providence near Scranton work has been suspended until the coal shoots at the breaker have been raised to accommodate the new gondola cars.

Hemlock Hollow Development Company.—This company has leased 550 acres of land about Hemlock Hollow and is to prospect for coal.

Fond Creek.—The old workings of this colliery near Hazleton that have been filled with water for 20 years are being drained and it is expected that a large amount of coal will be taken out.

Bituminous Coal.

H. C. Frick Coke Company.—At this company's No. 1 mine at Leisenring a new heading 5,000 ft. long has been completed and compressed air motors are to be put in on the main haulage-way. Austin King is superintendent.

W. P. Rend & Company.—This company's No. 1 mine at Laurel Hill is being equipped with 2 additional 100 K.W. generators, 2 engines, a 17-ton motor and 4 6-in. suction and discharge pumps. Ten extra mining machines are to be installed, and the output of the mine is to be increased from 700 to 1,500 tons per day. The grade of the mine has been reduced from 2½% to 1%, and 10,000 ft. of 60-lb. rails are being laid. The mine will be in full operation by April 15th.

Slate.

Bangor Peerless.—Excavations are down 100 ft., where an extra quality of rock is found. An output of 1,500 squares monthly will be maintained this summer.

Bangor Valley Quarry.—One rope is working to 4 shanties and a new bed is being stripped.

Blue Mountain.—A big cave-in recently occurred in this quarry, at Slatington, owing to heavy rains.

Bowers & Mutton.—In March, 4 shanties working from one rope at this Bangor quarry made 900 squares roofing slate. One shanty split and dressed 252 squares, establishing a record for this region. Very fine rock is being worked from an upper bench.

Consolidated Lehigh Slate Company.—A lease has been taken from Harrison Krum on about 5 acres of land at Slatington for several years. At one time the Empire Slate Company worked a quarry on this tract. The Consolidated Lehigh Company is pumping out the water in the quarry preparatory to active operation.

Danielsville Slate Company.—Parties headed by W. Jay Turner, president of the Lehigh & New England Railroad, have an option on this property. As soon as the lease is closed and the new company chartered the quarry will be enlarged and new equipments added.

Fidelity Quarry.—While making 2,000 squares a month Kress, Speer & Company, of Bangor, cannot keep up to orders. Like many other quarries in the section, they have no slate on the bank and will work extra force all summer.

Keystone Slate Company.—Work was resumed at the company's quarries, at Chapman, April 1st, after 2 years' idleness, employing 180 men. To secure the requisite labor a raise of 15% of wages has been announced, dating from April 15th.

Park Slate Company.—This company is pumping water out of the hole to start making slate May 1st.

Pen Argyl Excelsior.—William Masters' Sons have their quarry well stripped for this season of the year and expect to make 2,200 to 2,500 squares per month.

SOUTH DAKOTA.

Lawrence County.

(From Our Special Correspondent.)

American Mining Company.—This company has sunk the Dacy shaft to the 500 ft. level, bottom in limestone. No water to bother.

Chicago and Two Bit Mining Company.—This company, one of the Hardin organizations, is still running a drift in quartzite. A Corliss engine and air compressor were recently ordered.

Deadwood Mining & Development Company.—This company has been reorganized. New officers are: President, J. M. Rickel; vice-president, John Mauss; secretary, Sol Star; treasurer, Fred Zipp; director, W. H. Moore. The company was organized 3 years ago by 60 business men of Deadwood, but the membership fell to about 30. The company has now been incorporated with \$500,000 capital. Property is on East fork of Two Bit near the Detroit & Deadwood.

Gold Edge Mining Company.—Shaft is down 55 ft. Ground lies north of Gilt Edge Mine and is worked by Rhode Island parties.

Norwich.—Messrs. Shaw, Morrow, Stokes and others have sold their lease on the Norwich in Strawberry Gulch to C. W. Swan and B. H. Kingsbury, of Sioux City, Ia. The new lessees are negotiating for the stamp mill at Galena, owned by the Galena Mining and Smelting Company.

Omega.—This mine at Terraville, owned by P. L. Gibbs and B. C. Cook, is one of the oldest in the county. A new shoot of rich ore has been encountered. The owners expect to start up the Hildebrandt stamp mill at Gayville.

Silver Bullion.—John Collins, of Lead, has leased this old mine, in Strawberry Gulch.

Sunset.—Quartzite has been encountered at 310 ft. Drifting will begin to find the ore shoots worked in adjoining mines which are supposed to pass through Sunset ground. This is a Minneapolis company. W. W. Eastman, president; F. W. Johnson, general superintendent.

TENNESSEE.

Polk County.

Pittsburg & Tennessee Copper Company.—Lewisohn Brothers, of New York City, have purchased this company's copper mines near Ducktown together with the London Mine and the Burra-Burra Mine, for \$157,500 cash. The only remaining copper properties in the Ducktown District are those belonging to the Ducktown Sulphur, Copper and Iron Company. The Pittsburg & Tennessee property was opened up 7 or 8 years ago. It has well equipped works, but has been in the hands of a receiver for the last 2 years. The London and the Burra-Burra have not been worked since 1872 and were worked for black copper ore only. Lewisohn Brothers are to do considerable development work about the mines at once and later will put in a smelting plant. Randolph Adams, late manager of the Central Broken Hill Mine, New South Wales, will be general manager of the property, while J. Parke Channing, of New York City, will act as consulting engineer.

UTAH.

Box Elder County.

Iowa Mining Company.—This company, recently incorporated at Salt Lake, seems to have reached the limit in low par values for stock, its capital being 500,000 shares of 1c. each. Ell L. Price is president; R. D. Woodruff, vice-president; George B. Greenwood, secretary and treasurer, and the other directors are H. P. Mason and A. T. Sanford. The company's property consists of the Anna Laura and 8 other mining claims.

Salt Lake County.

Milkmaid.—James Chipman and Dan Clift, of Salt Lake City, have given a 2-years' bond and lease on this mine, in American Fork canyon, to Messrs. N. G. Merrill and W. W. Mathews, of American Fork, who will begin active work this spring. The mine was a producer of lead-silver ore, carrying average values of 50% lead and 50 oz. in silver to the ton, but the presence of water stopped production. The mine was worked by an incline shaft, which followed the ore body on its dip to a depth of 259 ft. A tunnel has been run a distance of 500 ft.

Sacramento.—At the annual meeting officers for the ensuing year were elected as follows: Glenn R. Bothwell, president; E. E. Jenkins,

vice-president; Robert E. McConaughy, secretary and treasurer; W. C. Hanna and R. A. Deal, directors. All of the officers were re-elected except Mr. Deal, who goes into the directorate in place of M. Flynn.

The expense for mining and milling, including development and improvements, according to the report, amounted to a little over \$1.60 per ton, dry ore. Had it not been for a cave-in in September, the cost of mining and milling would not have exceeded \$1.25 per ton. A contract has been entered into between the company and the Jordan River Power Company for furnishing electric power to operate the mill. The treasurer's report showed: Balance on hand January 5, 1898, \$18,883; receipts, cyanides since last meeting, \$138,364; total, \$157,247; dividends, \$65,000; expenses, \$77,181; total, \$142,181; balance on hand, \$15,066; total, \$157,247.

Mr. McConaughy states that since the last report 45,606 tons of ore had been mined and milled, showing average values of a trifle better than \$3 per ton.

Summit County.

Daly-West.—The mill at Park City has started. It has a capacity of 125 tons of ore daily. Manager Daly is reported as saying that later in the season large quantities of crude first-class ore will be taken out, and this will begin as soon as the old Ontario drain tunnel is cleaned out and repaired. This tunnel connects the Daly-West mine with Park City, and arrangements have been made to make it an outlet through which shipping ore and concentrates will find their way to the railroad, doing away with the necessity of the proposed tramway. A force of about 80 men is now busy at the mine and mill.

Tooele County.

Daisy.—A major portion of the capitalization of this West Dip company has been purchased by John Dern, manager of the Mercur, and his associates, the deal including the holdings of the eastern stockholders of the company, as well as what interest A. H. Mayne owned in the association. Mr. Dern was elected a director of the company in place of Director Wilson, resigned, and it is stated that the management of the company has been offered to Mr. Dern. The Daisy is well opened and developed, and shows extensive bodies of a good grade of leaching gold ore in its workings. It is equipped with a fine mill.

VIRGINIA.

Virginia & Southwestern Railway Company.—This company and its subsidiary company, the Virginia Iron, Coal and Coke Company, that recently purchased a number of blast furnaces, and the South Atlantic & Ohio, and Bristol & Elizabethtown Railroads, is to have headquarters at Bristol. George L. Carter is president of both companies. The Bristol & Elizabethtown road, it is said, will be extended to the iron ore fields of Johnson County at once. Engineers are surveying the route up the Watauga River Valley. This road will bring the iron ore to the Bristol furnace.

WASHINGTON.

(From Our Special Correspondent.)

Ferry County—Republic.

Mining Outlook.—The camp grows livelier, and people are coming in daily. Money is scarce, because the mines yet are mainly prospects, and there is only one mill—the Republic. This company has had a man experimenting on plain cyaniding for its ore.

Ben Hur.—A vertical shaft will be sunk to cut the vein at 300 ft., 100 ft. below the tunnel. It will be 375 ft. north of the south end line, and will be 3-compartment, with 2 4-ft. square compartments and a pump and manway 4 by 5 ft. The frame timbers will be 12 in. square, and the dividing timbers 8 by 12 in.

Black Tail.—Tunnel work is suspended. Some surface work is being done.

Dora.—The shaft is down 54 ft, and through the foot wall.

Golden Lily.—The shaft is down 30 ft., and cut the vein at 14 ft.

Gold Ledge.—This property, about 3 miles east of Republic, has a ledge 40 ft. wide, opened by a 42 ft. shaft. Assay samples have shown gold \$47 to \$111 per ton.

Independent.—A fine body of quartz, 5 ft. wide, carrying galena, gold and silver, with a trace of copper, has been opened in this claim at Cody.

Insurgent.—The new shaft is down 15 ft.

Iron Monitor.—There are now 8 in. of ore reported in the north drift, which starts 184 ft. in and 140 ft. deep on the dip.

Liberty.—A shaft is down 46 ft., showing a small quartz vein.

Lone Pine.—The tunnel is still on the foot wall, and sinking on the vein continues. High assays are reported.

Mary Ann.—The new incline is down 30 ft. on

a vein of quartz and iron ore, which runs \$17 per ton.

North San Poll.—The shaft is down 55 ft. The vein holds its own, and the ore values are increasing.

North Star.—This is one of the properties claiming to carry the north extension of the Republic vein. The tunnel is in 160 ft.

Republic Gold Mining and Milling Company.—It is now stated that this company has been reorganized as the Republic Consolidated Gold Mining Company, with Patrick Clark president, and the other directors W. J. C. Wakefield, L. H. Long and James Clarke, of Spokane, Wash., and J. McQuaig and A. A. Ayres, of Montreal, Quebec. The home office will be at Spokane. The capitalization is 3,500,000 shares, at a par value of \$1. The shareholders in the old company get 3 shares of the new stock for one of the old. It is announced that a shaft is to be sunk to 1,000 ft. The capacity of the mill will be increased to 100 tons a day. The principal work in the mine now is on the No. 3 level, driving north and south on the pay shoot, and sinking a winze in the country porphyrite. The mine looks very well.

A dividend of \$35,000, or 1c. per share, on the new capitalization is announced, payable April 15th.

San Poll.—The winze and upraise, connecting the Nos. 1 and 2 levels may meet before April 8th. The ledge has held its own down the winze for 54 ft.

Summit.—The tunnel is in 61 ft. to the fissure, and continues 39 ft. through conglomerate, which, it is claimed, all assays. Thence a 25-ft. drift runs along the west wall. The conglomerate is 27 ft. thick.

Trade Dollar.—Ore that runs from \$40 to \$50 per ton is coming out of the south drift.

WISCONSIN.

Dougllass County.

North Wisconsin.—This company has now 15 men on development work at its copper property.

Badger Copper Mining Company.—This company has been organized under the laws of South Dakota by E. J. Van Vleck and other Superior men to develop copper lands southeast of Superior.

FOREIGN MINING NEWS.

CANADA.

British Columbia—West Kootenay District.

(From Our Special Correspondent.)

Eight-hour Law.—The clause in the mining amendments act recently passed by the Provincial Legislature, providing that no person shall be employed under ground in any metalliferous mine for more than 8 hours in every 24, is unpopular with mining employers, on the ground that it materially adds to the cost of production. It is not unlikely that a reduction of the rate of wages may follow.

Brandon & Golden Crown.—According to the annual report the 2-compartment 4 by 8 shaft down 154 ft. is to be opened to 300 ft. with levels at 250 and 300 ft. At the 150-ft. a diagonal upraise of 60 ft. to the 100-ft. level found a body of pay ore with values from \$17 up in gold, and from 0.80% up in copper. A force of 17 men is at work. The plant comprises a 50-h. p. boiler, a 30-h. p. Lidgerwood hoist, and a 140-gal. Knowles sinking pump; also buckets, piping, wire rope, etc. A 5-drill compressor will be installed in April. The officers are: T. Mayne Daly, president; W. J. Porter, vice-president; Geo. N. Collins, managing director; W. L. Orde, secretary-treasurer. The ore is said to be copper and iron pyrites in a quartz gangue.

Iron Horse.—This company, which represents Rossland and Eastern capital, began work in October, 1898. The Ingersoll 7-drill compressor is on the Idaho claim 1,200 ft. below the shaft house. A 4-in. pipe runs to the shaft which is down 300 ft., besides a swing of 20 ft. The machinery is working well. The shaft is on Monte Cristo Mountain 2,800 ft. north of the Great Western. George Pfunder is superintendent.

Rossland Ore Shipments.—These for the quarter ending March 31st amount to about 10,000 tons. The Le Roi is shipping about 350 tons daily, while the War Eagle has begun to ship about 200 tons weekly. The Iron Mask continues small shipments.

Ontario—Lake of the Woods District.

Virginia Gold Mining Company.—The main shaft on the property is now 125 ft. deep. The vein is reported to be a little over 3 ft. wide with high values. Mr. Brockunier is resident manager.

Yukon District.

United States Consul McCook, writing from Dawson under date of February 11th, says: "The

coldest weather we have had was between the 8th and 15th of November, the thermometer registering 40° to 50° below zero. The month of December was ideal winter weather, the thermometer then only registering around zero. In January we had a couple of weeks of very cold weather. Stampeding to relocate claims where owners failed to do the necessary representation work, or to some reported locality said to be good has been very frequent all winter. The majority of such stampedes, however, proved failures.

"The winter here as a whole is preferable to summer, as traveling over the creeks and trails is much easier. It is not an uncommon occurrence for one to travel from 50 to 60 miles in a single day with a couple of dogs. In summer, one must traverse bog and morass, and wade through streams. In winter, a couple of dogs can easily pull from 500 to 800 lbs. on a sled.

"The extremely moderate weather has had the effect of reducing the price of wood from \$35 to \$15 per cord; last year the average price was \$60 per cord. This weather has also caused many of the miners to suspend work on the creek claims on account of the water coming into the shafts where tunneling of drifting had to be done. A machine for taking water out of the mines on the siphon principle works very effectively. It also acts as a thawing machine. There are about 20 of them in successful operation here—all that can be obtained at present. Hundreds of similar machines can be advantageously used in summer time for thawing ground and pumping water where drifting has to be carried on. Many people who have had "lays," or leases, on claims, and who failed after a couple of months to find sufficient to pay, have gone out over the ice; a goodly number toward Alaska."

MEXICO.

Chihuahua.

(From Our Special Correspondent.)

Mining Boundaries.—The lack of proper monuments to mark the boundaries of mining properties in this State is so felt by new locators and prospectors that the Government officials are preparing to put the clause of the mining laws requiring the placing of land-marks into effect at once.

New Prospects.—A rich silver prospect is reported as discovered 20 miles northeast of the upper Yaquira River near the Sonora line. Samples of the ore sent to El Paso gave returns of 200 oz. silver to the ton. The ledge was discovered by an Arizona prospector named Ferguson, who has gone to Nogales, Ariz., to raise money to develop the property.

Paral.—G. P. Mackey has his new concentrating plant about ready to start in Santa Barbara and has machinery ordered to increase the capacity of the present mill about 100%.

Coahuila.

(From Our Special Correspondent.)

The district of Monelo produced in January, 14,949 tons of metal, valued at \$450,872. The State taxes amounted to \$9,017, and the Government taxes were \$2,705.

Durango.

Sierra de Mercedi.—According to press despatches this famous deposit of iron ore near Durango has been purchased by C. P. Huntington. The price is placed at \$800,000 in gold. The Mexican International Railway is built to the foot of the mountain, and it is said extensive steel works will be established.

Hidalgo.

(From Our Special Correspondent.)

San Francisco.—At this mine at Pachuca the largest Cornish pump in the Republic of Mexico is being put in. Several new stone buildings are being erected.

Mexico.

(From Our Special Correspondent.)

American Railway and Lumber Company.—This road from Tuitenango to El Oro has been formally opened and trains now run on regular schedule. The traffic taxes the equipment to the utmost.

Sonora.

(From Our Special Correspondent.)

Denouncements.—During February 83 mining denouncements were registered in this State.

Compañia Union Minera.—The negotiations between Denver (Colo.) parties and the Compañia Union Minera for the latter's properties at Minas Prietas and La Colorada are reported in a fair way of culmination. J. D. Bowman and C. R. Roestedt have returned to Denver very favorably impressed. They also visited some copper properties in the Moctezuma district.

Cushinbery.—George Hopkins, in the early '80s one of the heavy operators of New Mexico, has purchased from Eugene Baird this property, a copper proposition. It is stated that Mr. Hopkins proposes to reopen the mine at once and work it on a large scale.

COAL TRADE REVIEW.

New York. April 7.
Anthracite.

The demand for anthracite has fallen off with warmer weather, and business is bound to be slack until inland navigation opens next month, when a very large amount of coal will go forward. As the anthracite market is a weather market, however, the production will probably not show much increase till coal begins to go into storage in the late summer. So far as can be seen the various producing interests are holding together in limiting outputs, and though reports of sales at prices considerably below schedule are heard, such reports, often true, are to be expected when demand falls off decidedly. As to the New York, Wyoming & Western Railroad, which certain independent operators about Scranton say will surely be built, its prospects are pretty slim. The situation seems to be that some large boys, having by threats got nice pieces of transportation pie, the small boys who backed up the big boys but got nothing are doing a little threatening in the hope of getting something also.

Trade in the West is fair. At the head of the Lakes there is practically no business, the docks being about cleaned up. The ice in Duluth Harbor is said to be nearly 4 ft. thick, and the prospects of navigation opening before May 10th are poor. In Chicago territory the demand has been good. Coal is coming in by rail enough to relieve immediate needs, but no one buys more than is necessary, and consequently any drop in temperature brings a good demand. It is estimated that but little over 20,000 tons will be on Chicago docks when navigation opens.

In the East business is fully as good as usual at this time of the year. Prices generally are reported as well maintained, though the larger sizes are not in much demand. We continue to quote free burning anthracite f. o. b. New York as follows: Broken, \$3.20; egg, \$3.40; stove, \$3.75; nut, \$3.75. The small sizes are, pea, \$2.75; rice, \$2.50; buckwheat, \$1.60.

Notes of the Week.

The Lehigh Valley Coal Company makes the following statement for February and the three months of its fiscal year from December 1st to February 28th:

	February.	Three mos.
Earnings	\$1,387,455	\$4,780,849
Expenses	1,492,189	5,010,031
Deficit	\$104,734	\$229,182

For the three months the earnings show an increase of \$687,867, and the expenses an increase of \$813,926, as compared with last year.

Bituminous.

The demand for soft coal from Atlantic seaboard points is large and the market is active. This activity is especially marked by a heavy movement from New York harbor shipping ports. This movement is limited chiefly by car supply. Both the Pennsylvania Railroad and the Baltimore & Ohio are adding to their rolling stock for this particular territory, however, so that this feature of the situation should improve. The demand from the lower ports for vessel tonnage has been strong and has sufficed to keep up ocean freight. As a result a great deal of coal has been diverted from the lower ports and the demands of consumers are being supplied from New York Harbor. This is especially true of the demand from points this side Cape Cod, as it can be supplied to a large extent by barges; so that at present New York harbor seems to outshine Delaware and Chesapeake Bay in coal shipments. The situation is due primarily to the short supply of vessels since the great storm of last November and the number of vessels carrying coal to the West Indies and Central and South American points. The only relief for producers shipping from lower ports seems to be such a reduction on through rates from mines to tide by the main lines as would leave little or no margin, or such a considerable decline in coastwise vessel freights as does not appear likely.

There have been labor troubles in the Clearfield, Beech Creek and West Virginia regions, but it is understood that operators generally are conceding the demands of the men, which in the main seem to be merely increased wages at those mines which were below last year's rate. The new schedule of rail tariffs seems, on the whole, to be slightly below last year's. Then the roads made high rate with liberal drawbacks. This year the rate is much lower but net.

In the far East the demand for coal has increased and a number of contracts have been closed during the week. These generally have been at f. o. b. shipping port figures. Along the Sound the demand is again as large as shippers could desire. New York Harbor trade is fairly active and all rail trade is large. It is reported that some coal is going all rail to Boston. Heretofore Holyoke has been considered the limit of all rail shipments to Massachusetts points.

Transportation from mines to tide is up to schedule and more regular. Car supply is lim-

ited, but is expected to improve. The companies are understood to be meeting the demands for cars as well as they can.

In the coastwise vessel market freight rates are up to what they have been, vessel supply being limited compared to demand. Current rates from Philadelphia we quote as follows: Boston, Salem and Portland, \$1.30; Providence, New Bedford and the Sound, \$1.30; Portsmouth, \$1.35; Wareham, \$1.25; Lynn, \$1.40; Saco, \$1.45@ \$1.55 and towages. From New York Harbor to Sound ports, 55c.@60c. Prices for coal are little changed. It is stated that the better grades can be bought at Philadelphia or Chesapeake Bay ports for \$1.60 per ton.

Birmingham, Ala. April 3.

(From Our Special Correspondent.)

The coal market is very active, and though the weather is much warmer than it has been in several weeks, the demand shows no falling off. Miners are in demand and the movement of a number of colored laborers from the coal fields in this State to the Indian Territory mines, where a strike is on, is being felt. The Littleton mines in this county need quite a number of miners, while other places are asking for good miners. The product is finding a ready sale. Run of mine coal is bringing 90c.@\$1.15 per ton. The prices are firm and the demand is steady.

In 10 days the new mines in Marion County, being opened for the Illinois Central Railroad, will be shipping coal; by that time the railroad being built to the mines will be completed. The Sloss Iron and Steel Company has begun work opening a new mine at Bivens' Station, one mile east of Brookside, in this county, and by June expects to be getting out coal. The side track to the new mine will be ready now in a few days. The Tennessee Coal, Iron and Railroad Company is preparing to open new mines near Pratt City.

The drivers in the mines at Belle Ellen and Blocton, in Bibb County, went out on a strike on Saturday last because of a demand for an advance in wages of 6 1/4%. As a consequence of the strike the mines had to shut down. Sunday the companies made a settlement with the drivers and work was resumed again at both places. Saturday the miners at Hargrove, also in Bibb County, quit work, but it is given out that the object was to take a vote on a certain matter that was before them. They are at work again and the usual output is being secured.

State mine Inspector J. deB. Hooper gives out the official figures of the coal output in the State of Alabama for the year 1898, with later returns, as follows: Total of lump, slack, nut and run-of-mine, 6,527,766 tons. This is an increase over the production of 1897, which was 5,893,771 tons, of 633,995 tons, about 20,000 tons more than at first reported some time ago.

Pittsburg. April 6.

(From Our Special Correspondent.)

Coal.—The river being in good navigable order, coal is being shipped as fast as mined and towed down to the landing. About 4,000 miners in the Fourth Pool had a regular jubilee, celebrating April 1st, which day inaugurates the eight-hour law. Meetings in the city were held all last week; some days it looks like a settlement, when something turns up and the meeting ends in a row. The talk now is for arbitration, but how it will terminate will be learned later.

At Johnstown, Pa., the Berwind White Coal Company advanced wages of about 1,500 men voluntarily, dating back to March 1st. The motor men of mining machines and the spraggers will have their wages increased accordingly. The rate is based on the present scale of 45c. a ton for pick mining, as prevailing in the Central Pennsylvania District.

The price of coal advanced 10c. a ton to take effect at once in small and medium-sized contracts and 5c. on large Lake contracts. Lake fuel and local markets will be most affected.

The Cincinnati Coal Elevator Company, recently chartered to control four big elevators in that city, has gone to pieces as a combine.

At Greenburg, Pa., Ellis Wissinger, representing a New York syndicate, has secured 8,000 acres of coal land by lease in Loyahanna township east of Latrobe, the average price being \$25, the lowest ever paid for coal in that district.

Connellsville Coke.—The coke region continues to boom, presenting a scene of activity never before experienced. As fast as ovens being idle can be prepared for coking they are fired up. Both production and shipments keep up, the tendency upward last week—production, especially—having made the week a record-breaker for months. The shipments were well up to 10,000 cars again and the active list of ovens were within a few of the largest list ever reported. The report shows 16,268 ovens in blast. The Alverton No. 1 plant, of 104 ovens in blast, rapidly gotten into shape for running and fires have been started in 75 of the ovens; all will be fired in a day or two and the plant making coke before the week is out. The demand for coke is very brisk and shows signs of increasing; with a fair increase in the car supply, it would not

be at all surprising to see fully 17,000 ovens in blast by the middle of the month. The shipments for the week in cars from the region here, 9,748 cars, increase over the preceding week 51 cars. The shipments in detail are as follows: To Pittsburg, 3,163 cars; sent West, 4,979 cars; shipped East, 1,606 cars; total, 9,748 cars. Shipments in tons, 174,555; increase, 896 tons.

SLATE TRADE REVIEW.

New York. April 7.

Increased activity is reported from the various producing centres, and now that milder weather is at hand we may expect an improvement in the demand for roofing and structural slate. Notwithstanding the good outlook for an increased home consumption and a regular, though smaller, export trade than last year, prices are much unsettled. This is due to the eagerness of some quarrymen to sell slate at almost any price; consequently competition demoralizes the market. To overcome this various plans have been suggested with little or no success. It is true a so-called price-list exists, but we feel assured that only a few concerns are realizing it. At the present roofing slate is selling in some cases at or very near the cost of production, notwithstanding the fact that assurances were made near the close of 1898 that prices would be higher. But for No. 1 Bangor roofing slate the present schedule price is 15@25c. less per square for some sizes than last year, and 65@75c. less than 1897. Bangor ribbon is from 10@25c. per square less than 1898, and 25@50c. less than 1897. Albion or Jackson Bangor shows a falling off of 15c. in some sizes from last year, and 30@65c. from 1897. Sea Green is about 15c. less than 1898, and from 70@80c. less than 1897. Variegated or mottled are as much as 50c. less per square for some sizes than a year ago. In the higher priced slates there have not been many fluctuations, though we believe they have been selling in several cases at less than a year ago.

The total shipments of roofing slate from Slatington in March were nearly 4,000 squares greater than in February, but as compared with January there is a falling off. School slates, on the other hand, show a large increase in March, while blackboards, although they exceeded the February movements, were somewhat less than in January. Walnutport shipped in March about 75% more roofing slate than in the preceding month, while a comparison with the January movement shows a falling off of about 42% in March. On the other hand, last month's movement in blackboards was about 40% greater than in February, but about 63% less than in January. A quantity of school slates were also sent through Walnutport in March, against nothing in the two preceding months. Danielsville showed more activity in March, and the output of roofing slate, blackboards and flagging were the largest this year.

Mill stock is unchanged in value. Some more slabs and manufactures have been exported. 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 23c. 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.

Slaters' supplies are quoted about as follows: Machine for punching and cutting slate to pattern, \$25, f. o. b. factory; hammer, \$3; ripper, \$1.75; stake, 75c.; slaters' felt, 500@600 sq. ft., 65@90c. per roll; elastic roofing cement, 3@7c. per lb., according to quantity, all prices at New York.

In export trade we hear of several large orders being taken for the British markets; one of these amounts to 300,000 roofing slates, or about 239 mille, for London. Prices of American roofing slate abroad are understood to be low, but the margin of profit is probably larger now that freight rates have fallen. The movement of roofing slate from New York is rather large just now, and much steamer room has been taken for the next month or so. More slate has been exported to Germany, and the total movement this month will probably exceed \$15,000—the largest amount this year. An increased quantity of slate has also been sent to Belgium and Denmark from New York during March. Freight rates from New York are as follows: To London, 12s. 6d. (\$3), or about 86c. per square roofing slate; Liverpool, 12s. 6d.; Manchester, Bristol, Leith and Hamburg, 15s. (\$3.60), or \$1 per square; Newcastle and Hull, 17s. 6d. (\$4.08), or \$1.17 per square; Copenhagen, Denmark, 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.

Baltimore exported this week 18,304 pieces, or 41 long tons (about 1,435 squares) roofing slate to Dublin, Ireland.

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 ville.	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	5.00	2.50	3.50	5.00
24 x 16..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
24 x 15..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
24 x 14..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
24 x 13..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
24 x 12..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
22 x 14..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
22 x 13..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
22 x 12..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
20 x 14..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
20 x 13..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
20 x 12..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
20 x 11..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
18 x 14..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
18 x 13..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
18 x 12..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
18 x 11..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
18 x 10..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
18 x 9..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
16 x 14..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
16 x 13..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
16 x 12..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
16 x 11..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
16 x 10..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
16 x 9..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
16 x 8..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
14 x 14..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
14 x 13..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
14 x 12..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
14 x 11..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
14 x 10..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
14 x 9..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
14 x 8..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
12 x 14..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
12 x 13..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
12 x 12..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
12 x 11..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
12 x 10..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
12 x 9..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
12 x 8..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
10 x 14..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
10 x 13..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
10 x 12..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
10 x 11..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
10 x 10..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
10 x 9..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
10 x 8..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00
9 x 7..	6.10	3.35	2.75	3.10	3.50	5.00	2.50	3.50	5.00

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, \$2.25@ \$2.90 per square, according to size. Intermediate sea-green \$2@ \$2.25 per square. Intermediate red, 14x7 and larger, \$6; 12x6, 12x7 and 12x8 in., \$5 per square, net.

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements, see also page 432.)

New York. April 7.

Heavy Chemicals.—Domestic alkali and caustic soda for prompt shipment continue scarce, in the face of a good demand, and prices are higher. Bleaching powder is easier, owing to the expected large arrivals. In chlorate of potash the spot supply of English is reported small, but as business is rather quiet prices are not affected very much. Domestic concentrated sal soda shows a better inquiry for future shipment, and prices are firm. The foreign concentrated sal soda is quiet and prices are unchanged from last week. Imports at this port included 312 casks bleaching powder. A comparison of the imports at New York for the quarter ending March 31st with those of last year shows a decrease of 31% in sal soda and nearly 77% in soda ash, but bicarb soda shows an increase of nearly 85% over 1898. The receipts of domestic goods at New York in the past week included 1,500 kegs and 830 sacks soda ash, 149 drums caustic soda, and 65 casks and 19 bbbs. potash. A fair export movement is noticeable in alkali. The imports of bleaching powder into the United States in February amounted to 9,890,901 lbs., or 1,066,660 lbs. more than last year. There were no exports of this in February this year, while in 1898 they amounted to 6,250 lbs. There were in bonded warehouses on February 28th, 1899, bleaching powder to the amount of 185,600 lbs., as against nothing last year.

The imports of soda ash into the United States in February were 2,201,583 lbs., a falling off of 4,327,887 lbs., as compared with last year. The exports were nothing in both years. There were in the bonded warehouses on February 28th, 1899, a total of 92,361 lbs., as against 413,930 lbs.

in 1898. The United States imported in February, 1899, 454,675 lbs. sal soda, an increase of 221,025 lbs. over the same month last year. The imports of chlorate of potash amounted to 40,765 lbs., a decrease of 339,488 lbs., as compared with February, 1898. The exports were 7,279 lbs., against 1,120 lbs. last year, and there were in bonded warehouses 21,951 lbs., against 31,460 lbs. in February, 1898.

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. f. o. b. works; 75@80c. delivered; foreign, 80@85c. Bleaching powder, Liverpool prime brands, \$1.50@ \$1.62½ per 100 lbs.; other brands, \$1.30@ \$1.40. Continental F prime, \$1.50@ \$1.65. Bicarb. soda, domestic, ordinary, \$1.12½@ \$1.25 per 100 lbs. f. o. b. works. Natrona brand, \$1.65. "Arm and Hammer" brand, \$2.25@ \$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, 9@9½c.; powdered, 9½@9¾c. per lb.

Acids.—Demand is good, while exports of blue vitriol are large. Imports included 20 bbbs. oxalic acid from Antwerp. The exports of domestic acids from the United States in February were valued at \$11,489, against \$9,667 last year. The movement in blue vitriol amounted to 4,398,054 lbs., valued at \$179,662, against 2,021,510 lbs., valued at \$63,339 in February, 1898.

Quotations per 100 lbs. for New York and vicinity are as follows: Acetic 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, \$11.50@ \$12 per ton f. o. b. factory. Blue vitriol (copper sulphate), \$5.25@ \$5.50 per 100 lbs. for best grades.

Brimstone.—Further arrivals of 3,000 tons are noted at this port. Prices nevertheless remain at \$22@ \$22½ per ton for best unmixed seconds on spot and \$21½@ \$22 for shipment, while thirds are quoted at \$2 less. Word has been received here that a company has been formed in England with a capital of £400,000 (\$2,000,000) to purchase and consolidate under one general management a number of sulphur mines and refining works in central Italy, principally at Romagna. This company is known as the Central Italian Sulphur Company, Limited.

The imports of brimstone into the United States in February amounted to 4,308 tons, against 12,710 tons last year. The exports were small.

Pyrites.—Deliveries on contract continue good and market prices remain unchanged. The United States imported in February 12,503 tons.

Spanish pyrites contain from 46% to 51% sulphur, the American from 42% to 44%, and Pilley's Island, N. F., about 50%. Quotations are: American lump ores (basis 52%), \$3.25 per long ton f. o. b. mines, Mineral City, Va.; \$5 per long ton f. o. b. mines, Charlemont, Mass., and \$6.50 per long ton for Pilley's Island, delivered in New York. Fines are \$3 per long ton f. o. b. Mineral City, Va.; \$4.25 at Charlemont, Mass., and \$4.50 for Pilley's Island, delivered in New York. Spanish pyrites, 11@13c. per unit, according to percentage, delivered ex-ship New York and other Atlantic coast ports.

Fertilizing Chemicals.—There is a good spring consuming demand for moderate sized lots and sulphate of ammonia is firmer, owing to the limited supply abroad, and the increasing inquiry for it. Domestic sulphate of ammonia is about all contracted for, the output being comparatively small. Higher prices are quoted in many instances. Potash salts are moving in a regular way. Imports this week at New York were 2,500 bags muriate of potash, 500 bags manure salt and 500 bags sulphate of potash. The imports of muriate of potash into the United States in February amounted to 4,000,317 lbs., against 2,156,181 lbs. last year. Of the imports in 1899 there were re-exported 21,504 lbs., against nothing in February, 1898.

Quotations are: Sulphate of ammonia, gas liquor, \$2.82½@ \$2.85 (basis of 25%), per 100 lbs.; bone, \$2.70@ \$2.72½. Dried blood, high grade, Western, \$1.70@ \$1.72½ per unit f. o. b. Chicago; New York, \$1.75@ \$1.80 per unit. Azotine, \$1.70@ \$1.75, basis New York. Concentrated phosphates (30% available phosphoric acid), 57½c. per unit. Acid phosphates, 13@15%, av. P₂O₅, 55@59c. per unit at sellers' works in bulk. Dissolved bone black, 17@18%, P₂O₅, \$16@ \$16.50 per ton. Acidulated fish scrap, \$9.75@ \$10; dried, \$13.50@ \$19 f. o. b. fish factory. Ammonia superphosphates, high grades, \$25@ \$26 per ton. Tankage, high grade, \$14½@ \$15 per ton f. o. b. Chicago; \$18@ \$18½ at New York. Concentrated tankage, \$1.40

@ \$1.42½ per unit f. o. b. Chicago; low grade, \$13@ \$13.50 per ton. Bone tankage, \$19.50@ \$20.50; ground bone, \$23@ \$25 delivered. Bone meal, Calcutta, \$27, and domestic steamed, \$19.50@ \$22, 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%, \$2.01½; 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. Sylvinit is quoted at 37@ \$38c. per unit sulphate of potash.

Nitrate of Soda.—Arrivals were large, amounting to 34,523 bags. Early in the week sellers were asking as high as \$1.70 for spot nitrate of soda, \$1.65 per 100 lbs. for nearby arrivals, and \$1.60 for shipment. To-day the market is easier; spot can be had at \$1.60@ \$1.62½, and futures at \$1.55 or less. The imports into the United States in February amounted to 2,292 tons, a decrease of 11,148 tons, as compared with February, 1898. Our exports during the month were 231 tons, or 100 tons more than last year.

Messrs. Mortimer & Wisner, in their monthly statement of nitrate of soda, dated April 1st, give the following statistics:

	1898.	1898.	1897.
	Bags.	Bags.	Bags.
Imp. into Atlantic ports from West Coast S. A., from Jan. 1 to date.	132,175	202,430	131,958
Imp. from Jan. 1 from Europe.....	.....	.....	.....
	132,175	202,430	131,958
Stock in store and afloat April 1, in New York ..	49,143	15,625	115,778
Boston.....	.....	.....	5,900
Philadelphia.....	.....	.....	.....
Baltimore.....	1,500	.....	7,000
Norfolk, Va.....	.....	.....	.....
Charleston.....	.....	.....	.....
To arrive, due July 15, 1899	278,000	222,000	119,000
Vis. supply to July 15, 1899	328,943	237,625	246,778
Stock on hand Jan. 1, 1899.	58,406	15,383	123,593
Deliveries past month.....	43,162	55,404	45,080
Deliveries since Jan. 1.....	139,638	202,188	127,773
Total yearly deliveries ..	.....	367,225	710,971
Prices current, April 1.....	1.60c.	1.77½c. @ 1.80c.	1.92½c. @ 1.95

Phosphates.—Producers are strong in their views, and consumers are obliged to pay high prices. Much activity is prevalent in prospecting operations, especially near Ocala, Fla., where several of the old pits that have not been worked for some years are again being opened. The shipments of phosphates from Punta Gorda, Fla., in March amounted to 4,761 tons domestic and 4,582 tons foreign, making a total for the first quarter of the year of 10,475 tons domestic and 6,887 tons foreign, or a grand total of 17,062 tons; all by the Peace River Phosphate Mining Company. We notice that 2,721 tons of the foreign shipments from this port in March went to Japan. We also understand that several other steamers have lately been chartered to carry quantities of Florida phosphates to Japan. The shipments of Florida high-grade rock from Savannah, Ga., in March amounted to 8,284 tons, all foreign, of which 1,000 tons went to Japan. The total exports of phosphates in February from all United States ports amounted to 51,423 tons, showing a large increase over last year. The exports to the United Kingdom greatly exceed those of February, 1898, while France shows a falling off. Germany, on the other hand, has increased her importations about 6%. At the present export trade is good.

Concerning the export market for Tennessee phosphates it is learned that the Tennessee Phosphate Company has sold its entire production until June. The company's agents abroad have taken, it is said, important orders for this year's shipment. They guarantee the company's washed and dried product to contain the minimum of 78% tribasic phosphate of lime and maximum 3% oxide of iron and alumina with the usual double allowance if over 3@4%. The German representatives of the Tennessee Phosphate Company claim that Tennessee phosphate has been delivered in Hamburg, Antwerp and other ports by other firms, containing nearly 5% oxide of iron and alumina, which has caused disagreeable and expensive differences between the superphosphate manufacturers and dealers. This phosphate is classed as unprepared and comes from properties where lack of water makes it impossible to clean the rock. The latest quotations for Tennessee, 78@80% rock, c. i. f. United Kingdom or North Sea ports is 8d. per unit. Other American phosphates are quoted as follows: Florida hard rock, 77@80%,

9½d., all positions; Florida land pebble, 68@73%, 7½d.; Florida Peace River, 58@63%, 7d. The Algerian, 63@70% phosphates are quoted 7½d. per unit. Charters noted at New York this week include a British steamer of 1,385 tons from Pensacola to Dunkirk at 18s. 6d. (\$4.44); one of 1,253 tons from Tampa to King's Lynn at private terms, April sailing; one of 1,117 tons from Fernandina to Aarhus, at 17s. 6d. (\$4.08), option Copenhagen at 18s. (\$4.32), June sailing, and one of 1,107 tons from Brunswick to Hamburg at 15s. (\$3.60), June sailing.

Quotations are: Florida high grade, 75@80% rock, \$9.50@10 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 \$5.50@6 per ton, delivered in New York; South Carolina ground rock is nominally at \$5.50 to \$5.75 per short ton, delivered in New York; sun-dried, \$3 per 2,240 lbs. f. o. b. Ashley River; hot-dried, \$3.25 f. o. b. same place, and \$3.45 f. o. b. Charleston, S. C. Tennessee phosphate is nominally quoted \$4@4½ f. o. b. Mt. Pleasant, according to quality. 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. The Hickman County (blue rock) phosphate is quoted at \$2.25 @ \$2.50 per ton f. o. b. mines.

Liverpool, March 28.

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

There is a very steady market for chemicals, but without much animation as regards export demand.

Soda ash is in fair request and for American orders for 58% alkali higher prices are again quoted. The maximum spot range for tierces may be called about as follows: Leblanc ash, 48%, £4 5s. @ £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. Soda crystals meet with the usual steady demand and barrels are quoted at £2 17s. 6d. per ton, less 5%, although for certain favored markets a lower range is quoted. Bags are 7s. per ton under price for barrels. Caustic soda is well held, but demand is only moderate. We quote spot range as follows: 60%, £6; 70%, £7; 74%, £7 10s.; 76%, £7 15s. net cash. Bleaching powder is steady at £5 per ton net cash for hardwood. Chlorate of potash is quiet at 3½d. per lb. for crystals and 3½d. for powdered. Bicarb. soda receives a moderate amount of attention from buyers, while quotations range according to destination from £5 5s. @ £6 15s. per ton, less 2½%, for the finest quality in 1 cwt. kegs, with the usual allowances for larger packages. Sulphate of ammonia is again dearer at £11 5s. @ £11 7s. 6d. per ton, less 2½%, for good gray 24@25% in double bags f. o. b. here. Nitrate of soda continues in moderate supply on spot, and holders now quote from £8 15s. @ £9 per ton, less 2½%, for double bags f. o. b. here, as to quantity and quality.

Valparaiso, Chile, Feb. 11.

(Special Report of Jackson Bros.)

Nitrate of Soda.—According to cable advices the spot price in Europe for nitrate has advanced to 7s. 8d. per cwt., and the deliveries have exceeded all expectations. Consumption in January is reported as 500,000 qtls. more than in the corresponding month of last year. Our market has been active and a large business has been done at 4s. 6½d. @ 4s. 7d. per qtl. for 95%, February-June deliveries; 4s. 8d. @ 4s. 8½d., August; 4s. 8½d. @ 4s. 9d., September-December. In refined a sale is reported of about 450,000 qtls., spread out in different deliveries from May, 1899, to May, 1900, at 4s. 9½d., alongside. Reported transactions during the fortnight sum up to 1,450,000 qtls. We quote 95%, February-April, 4s. 7d.; May-June, 4s. 7½d.; July-August, 4s. 8½d.; September-December, 4s. 9½d., and for refined, 4s. 9½d., March-June, all sellers. The price of 4s. 9d., with 27s. 6d. freight, stands in 6s. 5½d. per cwt., net, cost and freight, without purchasing commission.

IRON MARKET REVIEW.

NEW YORK, April 7, 1899.

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending		From	
	Apr. 8, 1898	Apr. 7, 1899.	Jan., '98.	Jan., '99.
An' racite	27	21,512	33	28,300
Coke.....	151	239,944	142	196,650
Charcoal.	16	6,944	16	4,625
Totals..	194	268,400	191	229,575
				3,266,838
				3,287,532

The iron market has been quieter this week, with a smaller volume of business in raw materials and fewer fluctuations in prices. This is not any indication of a falling off in demand, but is due rather to the general adoption of a waiting policy by large buyers. The furnaces which are now making deliveries on old contracts at

low prices, on the other hand, are looking forward to the closing of those contracts for a chance to share in the improvement and make some money. There will be a good deal of figuring on quotations for the second half of the year during the next two months. On the whole the advantage seems to be with the sellers.

While Bessemer pig prices have been steadied by the large sales recently noted, there is a good deal of uncertainty about foundry irons. At present the prices are very high as compared with Bessemer. There is a large demand, and for small lots for near-by deliveries almost any price is asked and paid. It does not follow that these quotations will be maintained on larger and later orders.

Finished material is in demand, and several large contracts for bridges and buildings are under discussion. The boiler makers and machine shops are taking a good deal of material, and shipyard requirements will be larger for some time to come. The future of the ship-building business is an interesting question.

We have reached the stage of increase in wages, and advances are noted in many large works. The Carnegie Steel Company this week gives notice of a general rise, which affects a large number of men.

Rumors of new combinations continue, but no definite news is to be reported this week. At present the promoters and underwriters are rather following up and devising possible new organizations for their own profit, and the movements from inside of the trade are few. In fact, conservative financiers are rather discouraging further organizations.

Notes of the Week.

The organization of the new Republic Steel Company is to be completed at a meeting to be held next week.

For the 8 months of the fiscal year, from July 1st to February 28th, the Bureau of Statistics reports the total value of the exports of iron and steel from the United States, including machinery, at \$58,377,784, which compares with \$42,864,262 in 1898, and \$35,781,809 in 1897. The exports of pig iron this year were 219,028 tons, against 175,007 tons in 1898, and 73,143 tons in 1897. Exports of steel rails reached a total of 176,737 tons, against 110,257 tons in 1898, and 70,383 tons in 1897.

Birmingham, Ala., April 3.

(From Our Special Correspondent.)

With a steady demand, prices firm and a tendency to look up, the pig iron market in this district presents the same condition that prevailed at the last writing. There is much iron being sold, while the shipments continue brisk. The talk indulged in by some of the companies to the effect that they have good stocks on hand and do not fear any demand that might be made on them, is a little ambitious. Secretary McQueen, of the Sloss Iron and Steel Company, reports the shipment of a small order of pig iron to Havana, Cuba, the second that has been made by the Sloss Company within the last two months. The coal miners have been granted another advance in their wages, the average mining prices being now 45 cents per ton. This indicates that for the last 30 days the iron prices have been up.

There is a good demand in the domestic market for the product, while the export trade is yet healthy. The report of the formation of trusts, by which both rolling mills and furnaces are to be taken under a "protecting arm" is still in the air and officials of the rolling mills do not deny that they are interested. The trusts have been of no service in the South so far, so it is stated, and there is rumor that those which have already reached down this way will close down some of the works, in order to lessen the production and thereby create a greater demand. Whether this is all talk or not, remains to be seen. There is still an active demand for finished iron and the mills here and at Gate City have great outputs. The iron is bringing good prices.

The following are the quotations given for pig iron: No. 1, foundry, \$11.50@11.75; No. 2 foundry, \$11@11.50; No. 3 foundry, \$11; Gray forge, \$9; No. 1 soft, \$11.50; No. 2 soft, \$11.25.

Buffalo, April 5.

(Special Report of Rogers, Brown & Co.)

This week has been one of much needed quiet. There is no pig iron to offer and buyers as a rule, being covered until June and July, are not in haste to place orders for the last half of the year. This is a satisfactory condition to all concerned, particularly to the producers, to whom an order is the last thing they wish to consider. Sales are being daily made in a small way, lots of one car-load to 1,000 tons on the basis of prices given below, which are quoted for cash f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$15.50; No. 2 strong foundry coke iron, Lake Superior ore, \$15; Ohio strong softener, No. 1, \$15; Ohio strong softener, No. 2, \$14.50; Jackson County silvery, No. 1, \$15.50; Southern soft, No. 1, \$16;

Southern soft, No. 2, \$15.50; Lake Superior charcoal, \$14.50@15; coke malleable, \$15.

Cleveland, O., April 5.

Iron Ore.—The market for iron ores as a whole continues quiet. A few small "jag" lots, so called, have been sold, but the whole number of tons disposed of is quite small compared, especially, with the early transactions of the season. And besides this there is now little or no expectation that further sales will be made involving anything like fair amounts before the first of next May, the time lake navigation is expected to open. Buyers and sellers are resting easy, the wants of the former being very largely supplied in early purchases, and the latter having very little to offer out of the early estimates of ores available this season. Both sides are awaiting developments. The lake freight situation also continues quiet, both ore-men and vesselmen waiting to see what further developments may bring. The prevailing prices are as follows: Specular and magnetic ores, Bessemer quality, \$3.75@4; 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 is strong, though not quite as active as reported at the end of last week. Sales have not been as numerous, though fair transactions are noted in foundry metal. The following are present quotations for iron f. o. b. Cleveland: Lake Superior charcoal, \$16.50@17; Bessemer, \$15.25; No. 1 foundry, \$15; No. 2, \$14.75; No. 1 Ohio Scotch, \$15.65; No. 2, \$15.15; gray forge, \$15.

Pittsburg, April 6.

(From Our Special Correspondent.)

The present outlook shows no particular change; the demand for both raw and manufactured products is still in excess of the supply. The April report of the furnaces will be watched with more than usual interest, as it will show how we stand as regards production of pig iron. One fact that makes material so scarce must be taken into consideration; that producers are delivering on heavy contracts made months ago; for example, December sales for future delivery were very large, extending several months at prices far below those governing the market at this time; and few, if any, furnaces have made any money so far. Cost of production has increased at a serious rate and contracts made 60 or 90 days ago, when prices were \$3 to \$4 a ton less on pig iron and \$10 to \$15 less on plates, bars, sheets, etc., are still being filled and some will run six or eight weeks longer before manufacturers can get much benefit from the advanced prices. What is most desired now is a steady market; higher prices are not regarded with much favor, but appearances indicate that, in spite of all efforts to the contrary, it will be impossible to avoid a higher level in the course of the next three or four weeks; buying may be as persistent as ever and advanced rates paid without the slightest demur, the chief object being to place the order, prices being a secondary consideration.

According to Mr. Swank's figures, the increased supply of pig iron during April, May and June may aggregate 38,000 tons per week.

Finished Material.—Under a continued heavy demand prices have further advanced. There seems to be no end to the demand and putting up. Quotations have very little influence, as it is not a question of prices, but of getting material or the offer of it as a basis for bidding on contracts for other work of a more advanced character.

Muck bar was more inquired for, with sales of good neutral, \$24.50@25, the supply on the market being light.

Skelp Iron and Steel.—The demand far exceeds the supply; prices continue to rule high. Iron skelp, sheared, \$1.80; grooved, \$1.55. Steel skelp, sheared, \$1.72½; grooved, \$1.50.

Ferro-Manganese.—Prices continue to advance, with sales reported of 80% at \$80 delivered.

Wire Nails.—Prices under a large demand rule firm, with sales of large blocks \$2.05@2.10; small quantities 5c.@10c. higher.

Steel rails are firm, with sales \$25; mills have large orders.

Wrought Iron and Steel Pipe.—Plants all running to their full capacity, some running double turn; prices unchanged.

Old Rails and Scrap Iron very firm, with a large demand; prices advancing.

Latest.—The market since our last shows scarcely any change. Pig iron and blows are scarce and prices normal. There is beginning to be a difference of opinion in regard to how long the present boom will last; both sides have their views and make strong arguments. One thing certain is that the end must come, and fixing the date seems to be the only question.

Carnegie's announcement of a big advance for 10,000 men was a great surprise, as their

previous contract has not expired. Let other big concerns go and do likewise.

Table with columns for CASH, TONS, and various grades of iron and steel products like 500 B., 500 Mill Iron, etc.

Steel Rails.—Quotations are \$26@28, but there is no business to report.

Old Rails.—Iron rails have taken a fresh and unexpected start up, and are wanted to-day at \$18. Steel rails are also wanted at \$16.

Scrap.—There are urgent demands from large scrap buyers to their agents to pick up whatever scrap can be had at current prices.

New York. April 7.

A feeling that prices are not likely to go higher is quite prevalent. A good deal of material has been taken at the high figures of the last few weeks, but there is more hesitation among buyers now.

In foreign business we note \$12,000 worth of agricultural machinery and \$24,000 worth of pumps and engines shipped to Holland; a shipment of \$20,000 worth of wood-working machinery to Germany; shipments of \$9,000 worth of steam engines and \$10,600 worth of mining machinery to Vladivostok, Siberia.

Pig Iron.—Talk of increased production holds prices steady. No one knows just how much of this production is covered by contracts for some time ahead, but more iron is expected.

Bar Iron.—Refined bars are 1.60c. and common 1.35c. for large lots on dock. Local business is fair.

Plates.—There is no especial change in the market. Mills are sold far away, and buyers are making the best terms they can get.

Steel Rails.—Prices are still quoted up to \$28 for standard sections. Foreign business is likely to show a considerable falling off.

Nails.—Prices are firm, with buying moderate. Wire nails in large lots are now quoted on dock, New York, at \$2.15; cut nails in carload lots on dock are now \$1.90.

Structural Material.—Some very good contracts have been closed during the week, the largest one of 6,000 tons.

Old Material.—The demand for all kinds of scrap is heavy and prices stay up. We quote, for New York deliveries: Old iron rails, \$20; old steel rails, \$14; hammered car axles, \$19; old car wheels, \$15; No. 1 wrought, \$16; machinery cast, \$13; burnt iron \$6@8.50.

METAL MARKET.

New York, April 7, 1899

Gold and Silver.

Gold and Silver Exports and Imports At all United States ports, February and year.

Table showing Gold and Silver Exports and Imports for February and Year (1898, 1899).

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 April 7th, 1899, and for years from January 1st, 1899, 1898, 1897, 1896.

Table showing Gold and Silver Exports and Imports for New York for the week ending April 7th, 1899, and for years 1899, 1898, 1897, 1896.

Exports of gold were chiefly to the West Indies; imports were in small lots from various sources.

The United States Assay Office in New York reports the total receipts of silver at 96,000 oz. for the week.

Financial Notes of the Week.

The general situation continues strong, with a large volume of business and trade in a very sound condition. Speculation is again active, and values have been worked up to a very high point, which is sure to be followed by some reaction; but this affects very little the manufacturing and other branches of business.

The large sums withdrawn for investment in new trust and industrial stocks is beginning to tell upon the money market. This, with the demands of business everywhere, is making money more scarce and dearer, at least for speculative use.

The large French order having been filled, the silver market eased off a little and closed at 27 7/16d. in London. There are no new features in the market worth noting.

On Friday high rates for short loans and the refusal of banks to accept industrial stocks as collateral, brought about a collapse in those shares in the New York Stock Market.

The statement of the United States Treasury on Thursday, April 6th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date of last week:

Table comparing Treasury balances for March 30 and April 6, with changes in Gold, Silver, Legal tenders, etc.

Treasury deposits with national banks amounted to \$88,732,216, a decrease of \$769,613 during the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending April 1st, gives the following totals, comparison being made with the corresponding weeks in 1898 and 1897:

Table showing Treasury deposits and balances for 1897, 1898, and 1899.

Changes for the week this year were increases of \$469,300 in loans and discounts, and \$49,800 in circulation; decreases were \$3,338,700 in deposits, \$3,118,200 in specie, \$777,800 in legal tenders, and \$3,062,575 in surplus reserve.

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:

Table showing Specie Holdings of leading banks in 1898 and 1899.

The returns for the Associated Banks of New York are of date April 1st, the Banks of England and France April 6th, and the others are of date March 30th, as reported by the "Commercial and Financial Chronicle" cable.

Shipments of silver from London to the East for the week ending March 23d, 1899, are reported by Messrs. Pixley & Abell's circular as follows:

Table showing Shipments of silver from London to the East for the week ending March 23d, 1899.

Chile; total, £315,000. There were no shipments this week.

The total coinage of the Mints of the United States in March, and the three months ending March 31st, is reported as below by the Bureau of the Mint:

Table showing Mint coinage for March and Three Months. Columns include Denom., Pieces, Value, and Total. Rows include Double eagles, Eagles, Half eagles, and Quarter eagles.

The total coinage in March shows a falling off of \$1,908,597, as compared with the previous month; this decrease was all in gold.

Indian exchange is somewhat weaker, as exports are decreasing and money is now in better supply in the Indian banks. There have also been some remittances in rupee paper.

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

Table showing Circulation in Treasury. Columns include Gold coin, Silver dollars, Subsid. silver, Gold certifi., Silver certifi., Treasury notes, U. S. notes, Cur'y certifi's, and Nat. bank notes.

The average circulation per capita was \$25.45. The circulation decreased \$995,670 during March, but was greater by \$171,788,297 than on April 1st, 1898.

Daily Prices of Metals in New York.

Table showing daily prices for Silver, Copper, Tin, Lead, and Spelter in New York. Columns include April, Sterling Exchange, and various metal prices.

Average Prices of Metals per lb., New York

Table showing average prices for Copper, Tin, Lead, and Spelter from 1890 to 1898. Columns include Month, 1890, 1898, 1899, and 1898.

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.

Average Prices of Silver per oz. Troy.

Table showing average prices for Silver in 1899, 1898, and 1897. Columns include Month, 1899, 1898, and 1897.

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

Prices of Foreign Coins.

Table showing prices for Mexican dollars, Peruvian soles and Chilean pesos, Victoria sovereigns, Twenty francs, Twenty marks, and Spanish 25 pesetas.

Other Metals.

At the annual meeting of the New York Metal Exchange, April 3rd, the following officers were chosen: President, Robert M. Thompson (Orford Copper Company); vice-president, Adolph Lewisohn (Lewisohn Brothers); treasurer, Charles S. French. Managers: B. Hochschild (American Metal Company), Clifford B. Hendricks, L. Nachmann, Julius H. Lobdell, G. H. Hull (American Storage Warrant Company), G. E. Behr, Jesse Lewisohn, William Jay Ives; Arbitration Committee, Edmund Hendricks, S. A. Jennings, J. Mitchell Clark, F. Steiner, George W. Jaques. Inspectors of Election: C. H. Bolles, Jr., John Deardon, J. J. Archer.

Copper.—The improvement on which we dwell when we last went to press has made further progress. The demand has become still more pressing and supplies have not proved sufficiently plentiful to keep values from scoring another advance. Lake copper in particular has been eagerly sought after and 18 1/2c. is freely bid for spot and near-by metal, but all the mining companies appear to be entirely sold out, or nearly so, for several months to come. Electrolytic copper has also met with a fair demand, and prices for this description have advanced to 17c. for cakes, wire-bars or ingots and to 16 1/2c. for cathodes.

The foreign quotations show a considerable improvement, the price of g. m. b. spot having advanced steadily from £70 to £72 15s, and that for three months to £72 12s 6d. still higher values being freely predicted. In view of the fact that the foreign consumers must have used up nearly all the supplies which they contracted for about three months ago, and which they have not replenished in the meantime, values here are liable to experience a sudden and sharp advance if orders should now come in from that direction, and at a time when supplies here are very limited indeed. We quote refined and manufactured sorts abroad: English Tough, £75@£75 10s.; Best Selected, £76@£75 10s.; Strong Sheets, £81@£82; India Sheets, £79 @£80; Yellow Metal, 7d.

Tin, too, has improved, but not to quite the extent on this side that it has in the foreign market, where the advance has been considerably greater. We quote spot 24 1/2c. and futures 24 3/4c.

The London market, which closed last week at £109 12s. 6d., has since advanced steadily and closes to-day at £112 15s. for spot, £113 5s. for futures.

The visible supply of tin on April 1st. is reported as below, in long tons:

Table showing tin supply in long tons: Store, Afloat, Totals. Rows include London, Holland, U. S., exc. Pacific ports, and Totals.

Imports of tin into the United States for the three months ending March 31st were: English, 15 long tons; Australian, 50; Banka, 300; Straits, 7,510; total, 7,875 tons.

Lead continues to be very lifeless. The business transacted has been of small volume and at still lower prices, the closing quotations being 4.27 1/2@4.30c.

The foreign market, on the other hand, is very firm, and the metal has advanced to £14 10s. for Spanish lead, £14 12s. 6d. for English lead.

Arrivals of foreign lead at New York in March amounted to 3,600 long tons, all from Mexico. Exports of lead in bond were large, reaching a total 6,815 tons.

Imports of lead in ores and base bullion in February are reported by the Treasury Department at 8,646,960 lbs., chiefly from Mexico. This is a large decrease from last year, when the total was 17,575,742 lbs. The exports of foreign lead refined here in bond in February were 15,379,257 lbs., which compares with 14,567,544 lbs. last year.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: During the past week our market has gradually declined in conjunction with the general depression and unsettled market at seaboard. Today the market is nominally 4.12 1/2@4.15c., according to brand of lead and time of delivery.

Spelter.—Values continue to rise, the quotations at the close being 6.20@6.25c., St. Louis; 6.50@6.60c., New York.

The foreign market already appears to reflect by the higher quotations the effects of the falling off of the exports from this side, which had to be curtailed for the reason that the metal was needed here. The closing prices are £28@£28 2s. 6d. for good ordinary brands, £28 7s. 6d.@£28 10s. for special brands.

Exports of zinc ore from the United States in

Imports and Exports of Metals

Large table showing imports and exports of various metals (Aluminum, Antimony, Copper, Ferro-chrome, etc.) for Week, Apr. 5 and Year, 1899. Columns include Port, Expts., Impts., Expts., and Impts.

*New York Metal Exchange returns. †By our Special Correspondent. ‡Not mentioned elsewhere.

The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, 1/2c. a lb. Lead, 1 1/2c. a lb. on lead in ores; 2 1/2c. per lb. on pigs, bars, etc.; 2 1/2c. on sheet, pipe and manufactured forms. Nickel, 6c. per lb. Quicksilver, 7c. per lb. Spelter or zinc, 1 1/2c. per lb. in pigs and bars; 2c. on sheets, etc. Copper, tin and platinum are free of duty.

February are reported by the Treasury Department at 1,534 tons, which compares with 1,194 tons last year. Exports of manufactured zinc or spelter for the month were 2,999,463 lbs., against 2,861,464 lbs. last year.

Antimony.—The prices are unchanged from last week, viz., 10@10½c. for Cookson's, 9¾@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 35¼@38c. London prices are 14@16d. per lb., according to size and order.

Platinum.—Demand is active and prices continue high. For large lots \$15.50 per ounce is now quoted in New York; for smaller orders, \$16@17. The London quotation is 62@64c. an ounce.

Quicksilver.—The New York quotation remains \$42 per flask. The London price is £8 5s., with £8 1s. 3d. named from second hands.

Exports of quicksilver from all United States ports in February amounted to 209,469 lbs., against 61,973 lbs. last year.

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

Aluminum.	Per lb.	Per lb.
No. 1, 99% ingots.	35@37c.	Bismuth \$1.40
No. 2, 99% ingots.	31@34c.	Magnesium \$2.75@3
Roll'd sheets.	38c. up	Phosphorus 48@50c.
Alum.-bronzes.	20@23c.	Tungsten 70c.
Nickel-alum.	33@39c.	Ferro-tungsten, 60% 60c.

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

MINING STOCKS.

Complete quotations will be found on pages 429, 430 and 431 of mining stocks listed and dealt in at:

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

New York.

April 7.

The flurry in railroad and industrial shares, as a result of the restrictions placed by Wall Street banks upon the trust stocks offered as collateral has distracted attention from mining stocks. In some instances brokerage houses, during the last few days, have asked 8% for carrying these shares.

Dealings in mining stocks were largely in the Colorado group. Of those traded in, Elkton of Cripple Creek sold at 92½@95c., an advance of 4c. to 5c. over the opening last week. Anchoria Leland, which will pay a quarterly dividend of 3c. per share on April 15th, brought 93½@95c., showing a falling off in price of 3c. to 4c. from a week ago. Gold Coin of Victor, after selling at \$1.92½, rose to \$2.02½, but declined yesterday to \$1.97½@2. Isabella gained 20c. by April 4th, selling at \$1.10, but two days later transactions were recorded at \$1. Golden Fleece sold at 33¼@40c., and Gilpin & Lincoln at 42¼@45c., while Jennie Blanche's treasury stock rose from 40c. last week to 44¼c. on April 5th, and closed around 43c. San Juan Star found buyers at 33@33½c.; Mollie Gibson at 26@30c., and Mt. Rosa at 26½c. Anaconda Gold lost 1¼c. on Tuesday, but rallied again and sold at 58c.

In the California's Quicksilver stocks have been in some demand. The common shares brought \$2½@3½, and the preferred \$9@11 on sales of several hundred shares. Standard Consolidated was quoted at \$2.50@2.60.

Anaconda Copper of Montana showed sales of 4,450 shares at \$43@45. The Anaconda Company's connection with the Lawson copper combine is authoritatively denied.

The Comstock shares have been in fair request, and Consolidated California & Virginia sold at \$2.30, Sierra Nevada at \$1.25@1.30, Mexican at 80@90c., Ophir at \$1.40. Union Consolidated at 65c., Belcher at 50c., Gould & Curry at 44@53c., Potosi at 36c., Hale & Norcross at 38c., and Yellow Jacket at 29@33c., while the shares of the Comstock Tunnel Company brought 6@7c.

The Industrial Exchange has called for the first time the stock of the Pande Basin Gold Placer Company, of Sitka, Alaska. This company is capitalized at \$2,500,000 and M. L. Muhleman, Deputy Assistant Treasurer at the United States Sub-Treasury, in New York, is president. The property is situated in the Pande Basin, on Baranof Island, Alaska. The property has been leased for a term of five years to the Sitka Developing Company, with office in New York. At the end of that time it is to be turned over to the Pande Basin Gold Placer Company. The stock was quoted at 50c. per share.

The American Smelting and Refining Company's shares were actively traded in on the curb with some fluctuations. At the close common stock was quoted \$49@49½; preferred \$88@88½, and the subscriptions \$120@121½.

Two new Arizona companies are offering stock here. The Arizona Copper Syndicate, Limited, owning claims near Clifton, Ari., is offering some of its 100,000 shares (par \$5) at \$4. The New Vulture Mining Company, which has taken up the well-known old Vulture Mine, is offering its \$1 shares at 75c.

The Flat Top Coal Land Association has declared a dividend of 1% on the preferred and 1½% on the common stock, payable May 1st to stockholders of record April 15th.

Auction sales were as follows: Virginia, Tennessee and Carolina Steel and Iron Company, \$50,000 6% collateral trust bonds, January, 1891, coupons on (hypothecated), at \$100; 160 and 200 of the same at \$25 each lot; Otis Engineering and Construction Company, 13 shares of \$100 par, at \$10 per lot.

Boston. April 6.

(From Our Special Correspondent.)

We have again had a broad and active market, and a very heavy business has been done.

The new and speculative stocks have not been so prominent this week, the best trading having been in the dividend-paying copper stocks. This movement resulted in very high prices, Calumet and Hecla having sold yesterday at \$850, the highest price yet recorded, while Tamarack brought \$250, and other stocks of the same class in proportion. There was an exceptional interest in Parrot on account of the rumors of a change in control.

Speaking of rumors, the famous copper consolidation is again reported to be approaching a final settlement. Nobody knows yet what is to be in it, or how it is going to turn out; but this only seems to have increased interest in the reports. Several persons concerned have been in New York this week, which has given rise to still further rumors.

It is stated that the Standard Oil people have now secured control of the Parrot Company, holding 168,000 out of 230,000 shares.

The latest flotation is the Kaukaune Mining Company, brought out by A. B. Turner & Brother. The property adjoins the Winona and Wyandotte and is under the same management as the Mass Consolidated. Thomas F. Cole will have charge in Michigan.

The Arizona Copper Syndicate, whose \$5 shares are offered at \$4, seems to rely entirely on the success of other companies in the same district. Its maps and prospectuses have very little to say about the property—and that little is not substantiated by any evidence.

Operations on the Boston & Lake Superior copper mine, Douglas County, Wisconsin, probably will be begun soon. The capital stock, 50,000 shares, is less than usually issued by current new mining flotations.

The United Verde Junior Copper Mining Company offers 40,000 of its 200,000 shares at \$5 per share. The company owns 6 claims of about 120 acres near Jerome, Ariz. A 50-ft. tunnel, the prospectus says, exposes a 20-ft. vein, showing ore which assays 13% copper, \$2 in gold and \$3 in silver. General Peach of Lynn is president, and ex-Mayor Fisher of Waltham is vice-president. Subscription books opened April 5th, and will close April 10th. This is another of the companies which is "near" or "on the same formation" as a famous mine. It has taken the same name, too, as nearly as the law allows.

The Montana Coal and Coke Company is a new concern just introduced here. There are 200,000 shares, par value \$25, and a lot—it is impossible to ascertain just how many—of the shares have been sold here at \$10. J. A. Coram is president, with all that his name implies.

It is stated that the stock of the United Verde Extension is practically subscribed for. Of the 350,000 shares, 50,000 have been retained in the treasury. President Franklin Farrell owns 125,000 shares, and the balance was subscribed for by the public. The money received from the sale of stock will be applied to building a smelting plant and other necessities.

Copper Range and Trimountain stocks have been added to the regular list at the Stock Exchange.

3 p. m.—To-day there was a good deal of profit taking, but very little consequent reaction. The market was firm and there was good buying on every slight recession in price. Some quotations of mining stocks were as follows: Calumet, \$840; Quincy, \$174; Osceola, \$94 bid; Mayflower, \$10; Arcadian, \$68¼ bid; Montana, \$370; Franklin, \$27; Centennial, \$45½; Cochiti, \$14; Copper Range, \$49; Santa Fe, \$17¼; Rhode Island, \$14; Tecumseh, \$8; Parrot, \$55; Old Colony, \$16¼; Mohawk, \$37; Isle Royale, \$68; Union, \$7½; Ysabel, \$15; Wolverine, \$46¼; Victoria, \$8¼; Utah, \$45; Trimountain, \$14¼; Adventure, \$15; Arnold, \$10¼; United States, \$20¼ bid; Baltic, \$33¾; Fortuna, 75c. In other stocks, Dominion Coal sold up to \$57½, with good buying.

Salt Lake City. April 1.

(From Our Special Correspondent.)

Generous trading has prevailed throughout the week in Utah mining shares, but the tone of the market has been lower. More snowfalls and storms are in part responsible.

Daisy supplied a sensation in the announcement that the Mercur folk have secured control, and that John Dern will probably become president-manager. The shares went above 50c., doing a lively business, and then softened, closing strong 45c. bid, 45¼c. asked, which is above last Saturday's figures. Mercur continues to gain, and seems to have securely reached \$7. Sacramento paid the \$5,000 dividend to-day. The

shares are unchanged. Geyser-Marion did a lively business, and holds its strength. Chloride Point is dormant, and the mines are again snow-bound. The same applies to Northern Light and Little Pittsburg. Sunshine climbed to 97c., and fell back to 91c., and is firmer and higher than on the close of the prior week.

Samuel Newhouse has taken the presidency of Ajax, and Thomas Weir is managing director. The mine has a copper record, which has given currency to the rumor of its being listed in Boston. Mammoth still droops, with scant signs of recovery. Four Aces is lower and weaker, and there are hints of an assessment. Grand Central maintains the advance. Centennial Eureka has jumped above \$50—higher than for 2 years. Bullion Beck holds its own. Swansea has receded below \$4. Sunbeam is strong and in good form, and the same is true of Homestake. Star Consolidated closed higher than on last Saturday. South Swansea is firm.

Dexter attracts but little attention. Horn Silver paid the \$20,000-dividend yesterday. There is some quiet search for these shares. Dalton & Lark did a brisk business at last week's figures. Galena is lower, and Utah is about stationary, with little doing in either. Alice has issued the 1898 annual report, which is hardly up to that of the prior year, but the physical condition of the mines is excellent.

Valco shows some evidences of being well started again on the up grade. The stories of an assessment this month were, it is averred, turned loose for bear purposes.

San Francisco. April 1.

(From Our Special Correspondent.)

The stock market has been quiet all the week, with the old story of inside dealings and small fluctuations. Late in the week the report that the pumps in the Comstock would start up in a few days sent prices up. It will require more than the starting of the pumps to bring outsiders in.

Some quotations noted are: Consolidated California & Virginia, \$2.30; Sierra Nevada, \$1.30; Ophir, \$1.30; Mexican, 84c.; Best & Belcher, 65@66c.; Gould & Curry, 50c.; Belcher, 47@48c.; Yellow Jacket, 33c.

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

	1898.	1899.
January, shares	157,360	121,955
February	151,065	350,880
March	166,280	272,625
Total	474,685	745,460

Sales this year show a marked increase over last year, especially in February. March shows a decline from the preceding month, though the sales were much larger than in March last year.

The Morning Star Mining Company of Placer County has declared a dividend of \$2.50 per share. This makes the 100th dividend declared by this company, of which Lieut.-Gov. Jacob H. Neff is the superintendent and a large stockholder.

Paris. March 26.

(From Our Special Correspondent.)

There has been a good deal of business in mining stocks and more movement than in several weeks past; but it has been in some special directions, and some sections of the market are quiet.

Thus, in the metallurgical shares, there have been hardly any changes, and little buying demand. The public seems finally to believe that these shares are too high, which is probably true.

Copper stocks, on the other hand, have been strong and in demand, although the price of the metal has been uncertain. Rio Tinto has had a special rise on the announcement from London that the company will pay a dividend of 27s. 6d. for the second half of 1898, against 20s. for the first half. The high price of copper, however, is limiting sales very much. Buyers are taking only what they are forced to, and some enterprises are held back in view of the additional cost.

L'Electro-Metallurgie has not only recovered from its fall after the death of M. Secretan, but has taken a further advance on the statement that a dividend of 40fr. is to be declared. It is stated also that at the annual meeting next week a proposition will be made to increase the capital, in order to provide means for extending the business.

The zinc and lead shares are all strong, in view of the large business done in those metals and their high prices.

While the Transvaal gold stocks have had no special movement since my last letter, they continue strong. The reports for last year, which are now being published, show excellent results for the most part. The increase in production has not interfered with the general reduction in costs and the closer and more economical working. The deep level results are encouraging.

The political situation continues to affect the stock market to some extent. It is true that foreign affairs are in better condition now than at the opening of the year; but our domestic difficulties are not yet over. We hope for the best, but our uneasy elements may make us trouble.

Asote.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Adams Con., Alamo, Alice, Anaconda, etc., with columns for location, par value, and daily price movements from April 1st to 7th.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, including companies like Am. Sm. & Ref., Am. S. & W. Con., Central of N. J., etc.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, PA, listing companies like Bethlehem Iron, Cambria Steel, etc., with columns for location, par value, and price.

BALTIMORE, MD.

Table of stock quotations for Baltimore, MD, listing companies like Atlantic Coal, Big Vein Coal, etc., with columns for location, par value, and price.

ST. LOUIS, MO.

Table of stock quotations for St. Louis, MO, listing companies like Am. Coal, Am. Nettle, etc., with columns for location, par value, and price.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Aetna, cons. g., Adven'rs Cons, etc., with columns for par value, no. of shares, and price.

CLEVELAND, O.

Table of stock quotations for Cleveland, O., listing companies like Aurora, Gogebic, etc., with columns for iron range, par value, and price.

BUTTE, MONT.

Table of stock quotations for Butte, Mont., listing companies like Alice g., Am. Mer. & M., etc., with columns for location, par value, and price.

COLORADO SPRINGS COLO.

Table of stock quotations for Colorado Springs, Colo., listing companies like Alamo, Anaconda, Argonaut, etc., with columns for par value, price, and sales.

BALTIMORE, MD.

Official quotations Colo. Springs Mining Stock Exchange. Sales: Listed stocks, \$69,248 shares; unlisted, \$38,103 shares; total, 1,707,345 shares; cash value, \$34,337.56

By Telegraph.

Table of stock quotations by telegraph, listing companies like Alamo, Anchoria-Leland, etc., with columns for par value, no. of shares, and price.

STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colorado, listing various mining companies and their share prices for March 27, 28, 29, 31, and April 1.

Official Quotations Denver Stock Exchange. Sales: Mines, 18,000 shares; Prospects, including those mentioned, 120,000 shares; Miscellaneous, 107,500 shares; total, 335,500 shares.

SALT LAKE CITY, UTAH.

April 1

Table of stock quotations for Salt Lake City, Utah, listing various mining companies and their share prices.

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

SPOKANE WASH.

March 15.

Table of stock quotations for Spokane, Washington, listing various mining companies and their share prices.

†Telegraphic quotations of the British-Canadian Investment and Mining Syndicate. *Under Republic management. Total sales, 24,000 shares.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, California, listing various mining companies and their share prices.

Official telegraphic quotations of San Francisco Stock Exchange

TORONTO, CAN.

Table of stock quotations for Toronto, Canada, listing various mining companies and their share prices.

*Official quotations of the Toronto Mining and Industrial Exchange. Total shares sold, 48,500.

ROSSLAND, BRITISH COLUMBIA.

March 30.

Table of stock quotations for Rossland, British Columbia, listing various mining companies and their share prices.

*From Our Special Correspondent.

MEXICO.

March 30.

Table of stock quotations for Mexico, listing various mining companies and their share prices.

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.

VALPARAISO, CHILE.

Feb 25

Table of stock quotations for Valparaiso, Chile, listing various mining companies and their share prices.

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

SHANGHAI, CHINA.

Feb. 27.

Table of stock quotations for Shanghai, China, listing various mining companies and their share prices.

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

STOCK QUOTATIONS.

LONDON.

March 24.

Table of stock quotations for London, listing company names, countries, capital values, and dividend information.

* Dividend pending.

PARIS.

March 23.

Table of stock quotations for Paris, listing company names, countries, products, capital values, and prices.

MEETINGS.

Table of company meetings, listing company names, locations, meeting dates, and places of meetings.

DIVIDENDS.

Table of dividends, listing company names, current dividends, paid since Jan 1, 1899, and total to date.

* February dividend paid. † March dividend paid.

ASSESSMENTS.

Table of assessments, listing company names, locations, delinquency dates, sale dates, and amounts.

* New Assessment.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table containing two columns: 'DIVIDEND-PAYING MINES' and 'NON-DIVIDEND-PAYING MINES'. Each column lists company names, locations, capital stock, shares, assessments, and dividends. The table is organized into multiple columns for each section, including 'Name and Location of Company', 'Capital Stock', 'Shares', 'Assessments', and 'Dividends'.

Gold, S. Silver, L. Lead, C. Copper, B. Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Bodie, Bulwer and Mono transferred to Standard Cons., January, 1897. § The Deadwood previously paid \$1,677,572, Bulwer \$190,000, Mono \$12,500, and Standard \$900,000. ¶ Capitalization reduced September, 1898. ** Reincorporated in September, 1898. †† The Old War Eagle Company paid \$24,000 in dividends to July, 1897, and levied \$32,500 in assessments. Note.—This table is corrected up to February 28. 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 April 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 (e.g., Abrasives, Calcium, Mica, Potassium, Sodium, etc.) along with their respective units, measures, and current prices. The table is organized into several vertical sections.

THE RARE ELEMENTS.

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

Table listing rare elements and their compounds (e.g., Barium, Beryllium, Boron, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Germanium, Glucinum, Indium, Iridium, Lanthanum, Lithium, Molybdenum, Niobium, Osmium, Palladium, Rhodium, Rubidium, Ruthenium, Selenium, Silicon, Strontium, Tellurium, Thallium, Thorium, Uranium, Vanadium, Wolfram, Yttrium, Zirconium) with their units and prices.