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The Southern office of the Engineering and Mining Journal and the Scientific Publishing Company has been removed from Atlanta, Ga., to Birmingham, Ala., where it will hereafter be located, in the busy center of the Southern iron trade.

The effect of the recent decision of the courts in confirming the ownership of the Bradley patents under the Cowles agreement, and defining the wide bearing of these patents, is already becoming apparent in a suit filed April 5th by the Electric Smelting and Aluminum Company (Cowles) against the Pittsburg Reduction Company for infringement of patent and for profits and damages.

The suit with the Pittsburg Reduction Company will, no doubt, settle the ownership in this country of the only process at present in use in producing aluminum, and will probably confirm the business in a monopoly, which we consider a misfortune, whether it be in the Electric Smelting and Aluminum Company (Cowles) or in the Pittsburg Reduction Company.

The use of aluminum is extending, and with lower prices it would grow far more rapidly. At present the price is 30 to 40 cents per pound, but it is claimed that the actual cost of production at some European works does not exceed 12 1/2 cents per pound.

As seen from this side of the water, the recent rise in the Transvaal gold stocks on the London market seems to have too much manipulation about it to promise permanence. The apparent readiness of the Transvaal government to concede at last some of the demands of the Uitlanders and the mining companies, and to consider the desired reforms, was the nominal basis of the rise.

The Senate is now discussing in detail the provisions of the tariff bill, which its committee has changed into a measure differing essentially in many points from the bill as it passed the House of Representatives.

The main point is that the delay and discussion still continue with very indefinite prospects of coming to an end, while business continues to suffer and enterprise is checked on all sides. No one can or will undertake any new work while the uncertainty lasts, and trade is limited to immediate necessities.

While the property which certain metals have of giving off vapor from their surfaces when heated has often been observed, it has not generally been supposed that such vapors could be emitted at ordinary temperatures. A recent experimenter, Mr. R. Coulson, informs the Chemical Record, however, that he has ascertained that clean zinc will throw out

vapor at low temperatures in sufficient quantities to affect photographic plates, the results appearing plainly in development; and this will occur *in vacuo* as well as in the air. The vaporous emanations will pass through paper and through ordinary albuminized photographic paper, but not through pasteboard. Printer's ink, when dry, will not interfere with the passage of the zinc vapor, though it is stopped by ordinary writing ink—probably because of the gum which it contains.

The lowest temperature at which metallic vapors had previously been ascertained to exist was with zinc at 184°, the observations being made by Mr. Demerçay some 15 years ago. Mr. Coulson is positive as to the discovery and the existence of these vapors, and he believes that some practical applications of the fact may be made. Observers have heretofore noticed what they have called the odors of metals, and it seems very probable that these odors were due to the existence of a very small quantity of vapor, though its existence had not been suspected.

On further experimenting with metals other than zinc, it was found that cadmium and manganese gave out a perceptible quantity of vapor at ordinary temperatures; but none could be obtained in connection with lead, tin, copper, iron or aluminum.

American competition is coming to be a matter of serious consideration in the British iron trade, and we hear little more in the English journals the "merely temporary and abnormal conditions," from which imports of American products were supposed to result. Such imports are rather being accepted as an indication of what can be done, and what probably will be done in the future. Some high authorities seem to believe that the competition of American mills and furnaces will have to be reckoned with as a permanent factor in trade. At the recent annual meeting of the Iron and Steel Trade Association a considerable part of the opening address of the president, Mr. Edward P. Martin, was devoted to this subject. He considered at length the improvements made in iron and steel manufacture in the United States, the establishment of large plants, and the reduction of costs by the use of machinery and the greater comparative efficiency of labor. He also referred to the advantages which American iron-masters had derived from the use of water transportation for their supplies of ores and from the low railroad rates which they were able to secure. His conclusion was that to hold their own home markets, to say nothing of foreign trade, the British manufacturers must follow the lines laid down here; they must improve and modernize their plants and must use all possible means to secure lower freight rates from the railroads. The question of iron ore supplies is also one for careful consideration, as it is evident that the British furnaces must draw each year an increasing proportion of their supply from foreign mines at, probably, an increasing cost. In short, American competition in Great Britain itself, which was considered impossible only a short time ago, is now beginning to be accepted as inevitable, and the discussion of ways in which to meet it is in order.

The duties of a mine inspector with relation to an accident are usually confined to investigation after its occurrence, with a view to ascertaining its causes and preventing a repetition by the adoption of such measures as may seem necessary. In the accident at the Snaefell mine in the Isle of Man, which is described on another page, Dr. C. Le Neve Foster, the chief inspector of the British mines, had the unusual experience of taking part in the after results of the accident and escaping very narrowly with his life. Perhaps the practical test in this case was not needed, since Dr. Foster has had much experience in mining and is well versed in the various conditions which may result in injury or death to the miner; but there are cases in which a realizing sense of the value and importance of an inspector's duties would be very much promoted if the official should suffer and escape with the miner.

In this connection it may be well to call attention once more to the fact that in some of the States the mine inspection laws are still very defective, and there exists therefore no really useful inspection of mines and consequently very little protection for the miner. In others also the inspection force is limited, so that a competent officer may be overworked and limited by time as to be unable to perform his duties properly. In many cases they have to contend with the habits of the miner himself, who seems to delight in nullifying the precautions taken for his own protection.

While the majority of our mine inspectors are hard-working and conscientious officers, it is probable that there are very few who could sit down while waiting for what seemed at the time almost certain death and quietly fill up their note-books—as was done by Dr. Foster in the Snaefell mine. To say this is not to blame them, for men who can and do keep cool under such circumstances are very rarely found in any profession. We join our congratulations to those of the whole United Kingdom that this eminent engineer and efficient officer, and the able and courageous men with him escaped their imminent danger.

The Philadelphia Commercial Museums.

The opening of the Commercial Museums in Philadelphia this week with much ceremony, the President of the United States delivering the opening address, marks formally the beginning of an organized effort to cultivate our foreign trade. The plan of the museums originated, we believe, with the Manufacturers' Club, and was taken up by other commercial bodies in Philadelphia. The city has contributed to their establishment and will assist in their maintenance, and they will form headquarters for the merchants and manufacturers and their customers from abroad. The purpose is to form in the Museums a collective exhibit of raw materials and manufactured products of all kinds, and to add to this exposition a bureau of information, the work of which will be the collection of all attainable information here and abroad, by means of correspondence from periodicals and other sources. This will be at the service of all who desire to use the museums at a moderate cost, and they will also have access to files of foreign papers and other like advantages. It is also proposed to hold periodically congresses or conferences to which representatives of foreign countries will be invited.

The Museums are also provided with laboratories, where materials of all kinds can be analyzed and tested. From time to time special reports will be made on different countries and different branches of trade. It will be seen that the plan thus outlined is comprehensive and may be made very useful.

The work at first is to be directed chiefly to the Spanish-American countries on this continent, and in South America. We do not understand, however, that it is to be confined to those countries. It is begun there because it is believed that they present a most promising field for the cultivation of trade, and they can be reached readily and at once. In time the plan will be extended, and efforts made to reach other countries.

Our foreign trade has begun to develop already, and during the past three years the exports of manufacturers have shown a very considerable increase. This has been the result of special trade conditions, and not of any concerted effort. Such effort, if properly directed, can accomplish a great deal, and the new Philadelphia enterprise seems to be a step in the right direction. We have always believed in union of some kind as an essential step toward developing trade, and have frequently pointed out the methods adopted by the Germans with so much success. We have in the United States all the elements which ought to enable us to supply our neighbors with the manufactured goods they require, and should certainly profit by all our opportunities to a much greater extent than we have heretofore done.

The statement of mineral production which we published last week shows the extent of our natural resources in one field, and indicates the supplies upon which we can draw.

The opening of the Philadelphia Museums was a most satisfactory ceremony to all who were present. We extend to its officers our congratulations, and express our hopes for their success.

Waste Products in Iron Manufacture.

We are accustomed, and with some reason, to claim for our iron and steel plants superiority over those of European countries in many points. In our blast furnaces, for instance, we have increased the capacity to a point far beyond anything known abroad, and we have been able to make iron at a low labor cost, in spite of higher average rates of wages. This has been secured partly because our labor is on the average more efficient and intelligent, but largely by the use of machinery wherever possible, and by cutting down the amount of labor required to the lowest possible point. In handling large quantities of material, whether at the mines, in loading or unloading on the road, or at the furnace, the labor and time required have been reduced to a very low point, and no expenditure spared for machinery and appliances. To a certain extent also, we have by our methods secured economy in fuel and materials; and all this has been done without in the least reducing the standard of quality in the product. Our manufacturers are quite willing to compare their work with that of England, Germany and Belgium, and at the present time they are quite willing to compare costs and prices also.

In some respects, however, we have much to learn yet from our competitors. It is, perhaps, a consequence of our abundant supplies of raw materials that we have been careless about their use, and indeed rather inclined to wastefulness. This is especially apparent in the iron manufacture, where we have, as a rule, entirely neglected the by-products which in other countries form so important an element, that a German writer has suggested the possibility that before long the pig iron made will become a by-product, and the blast furnace will be valued chiefly for its output of chemicals. We are considerably behind the English and very far behind the Germans in this respect, and there is corresponding room for improvement.

The most important element of saving in European practice is found in the use of the by-product coke oven, which is almost universal in Germany, and is gradually making its way in England. In Scotland, where the majority of the furnaces use raw coal, and not coke, for fuel, plants are found at a number of the iron works where the gases escaping from the furnace are treated for the purpose of saving the ammonia sulphate, tar and other chemical products, while the purified gas is used for fuel in boilers. These plants, of course, serve the same purpose as the by-product oven, and are, perhaps, not especially to be recommended except under the peculiar conditions presented in Scotland.

In Germany and in some parts of France the slag from the furnaces is found of value for various purposes. In the former country large quantities of it are used for making bricks, for roads and similar purposes, and new applications for this material are constantly being found. In this country such uses are still comparatively rare.

One of the latest applications of a by-product is found at the Cockerill Works at Seraing, in Belgium, where the waste gas from a blast furnace has been for a year past used experimentally to run a gas engine. This has proved so successful—though coke is used for fuel in the furnace—that the company is now putting up two more gas engines of 150 horsepower each, and anticipates in time supplying a large part of its motive power from this source. Blast-furnace gas has also been recently utilized in the same way in Great Britain by Mr. James Riley, the well-known ironmaster.

The list here given could be very much extended, but perhaps enough has been said to direct attention to this important field for possible profits to be gained by the saving of waste. If we can already compete in price with Europe in iron and steel, how certain is our control of the world's market, and how greatly this will increase our own prosperity, when we utilize what we are now throwing away, things that are the chief sources of profit to our rivals. Every great iron and steel works should investigate possible uses for what are now their waste products and through the applications of science to industry turn them into profits. We hope to see great advances in this direction within a few years; indeed the careful saving of by-products will soon be a necessity, if our iron-men are to hold their own and to build up the foreign trade which is within their reach.

NEW PUBLICATIONS.

HOT WATER MANUAL. By Walter Jones, Chicago; the *American Artisan Press*. Pages 220; illustrated. Price, \$1.

This is a condensed and convenient manual relating to systems of heating by hot water for dwelling-houses and public buildings. It is mainly reprinted from an English work, and the tables and other calculations are based on experience in the English climate. There are many general rules and directions which are of use everywhere, and the book may be studied with advantage by those who are interested in the subject.

ANNUAL REPORT OF THE MINISTER OF MINES OF BRITISH COLUMBIA; 1896. Minister, Victoria, B. C.; Provincial Printers. Pages, 212; with maps and illustrations. Price 50 cents.

We have frequently referred to the excellent reports issued by the Ministry of Mines of British Columbia, and to their prompt issue, which much enhances their value. The present report is no exception to the rule. It contains a great deal of interesting information, and gives full statistics of the results of the mining industry for the year 1896. The growth of the industry in that year was a remarkable one, as we have noted from time to time. The work done in opening the new districts and new mines is here fully explained, and many details given of much service to those who have interests in the Province or are inclined to invest there.

MANUAL OF THE REPUBLIC, OR HOW TO BECOME A CITIZEN. New York; Excelsior Publishing Company. Pages, 120. Price, 50c.

There are contained in this small volume concise remarks on the naturalization laws of the United States, the qualifications for voting in each State of the Union, requirements regarding the registration of voters, with several short paragraphs on woman suffrage; the Constitution of the United States of America, with amendments and ratifications, to which 39 pages of the book have been allotted; the Declaration of Independence, containing the names of those who signed, comprising 14 pages; Washington's farewell address; Lincoln's Gettysburg address; Daniel Webster's speech, and a table giving the names of the presidents of the United States, with their paternal ancestry, parentage and biographies in brief from George Washington to William McKinley. The book is concluded by an index to the Constitution of the United States. The compilation and typographical work of this little pocket manual are good and the whole has been carefully bound.

CALIFORNIA STATE MINING BUREAU: BULLETIN No. 11. OIL AND GAS YIELDING FORMATIONS OF LOS ANGELES, VENTURA AND SANTA BARBARA COUNTIES. PART I. By W. L. Watts. Sacramento, Cal.; State Printing Office. Pages 96; illustrated.

This *Bulletin* contains the result of the investigations so far made on the oil regions of Southern California, which have proved an item of considerable value in the mineral resources of the State. The oil-fields thus far developed are the Los Angeles and Puente in Los Angeles County; the Sespe and Santa Paula in Ventura County; the Summerfield and Southeastern in Santa Barbara County. There are some other districts,

but thus far they have been little studied or developed. Further investigations are being made, the results of which will be published hereafter. The most important field now worked is the Los Angeles, in and about the city of that name, while the Puente wells come second in the amount of their output. The present monograph treats of the geology of the fields, the methods adopted in developing them, the results obtained in production, and the possibilities of extended development. The greater part of the region has no other mineral resources of importance than oil and its allied products.

A peculiar development, of a kind, we think, unknown outside of California, is found in the oil tunnels of Ventura County. These tunnels are on the southern slope of the Sulphur Mountains, and have been run through strata of dark colored clay, slate and soft sandstone, with an occasional hard stratum of a calcareous nature. The oil is usually struck in the sandstone, but sometimes it cozes from fissures in the slate. It is usually accompanied by sulphuretted water. The oil and water together are allowed to run down a gutter in the tunnel into separating tanks, where the oil rises to the surface and is drawn off into a pipe-line. In running these tunnels some unusual precautions have to be taken. They are lighted either by reflected sunlight or by incandescent electric lights; the blasts are discharged by electricity.

A considerable part of the oil produced in Southern California is used as fuel. The coal supply of the region is brought chiefly from Puget Sound and British Columbia and its cost is high, so that crude oil from the local wells is found to be a cheaper fuel. Thus the locomotives on Atchison, Topeka & Santa Fe lines in this section of the State nearly all burn oil. It is also used by the locomotives on the local lines of the Southern Pacific, and in the local factories and electric plants for raising steam. The burners generally in use are different forms of the spraying burner with jets of steam or compressed air. No difficulty whatever is found in using the oil, and here, as elsewhere, the decision between coal and liquid fuel is made entirely on the question of cost. In a country where bituminous coal of ordinary quality is sold in large quantities as high as \$6 to \$8 per ton, it is easy to see that oil at \$1 per barrel is a very valuable addition to the fuel supply.

The California oil region is an interesting one, both geologically and economically, and this *Bulletin* contains much information that is of value relating to it.

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.

Coal Statistics, 1897. Philadelphia, Pa.; Published annually by Alder & Ruley. Pages, 203. Price, 50c.

Home Railways as Investments, 1897. By William J. Stevens. London, Eng.; Effingham Wilson. Pages, 237; with 13 tables. Price, in New York, 90c.

An Inquiry as to a More Perfect Form of Water-Wheel. By J. P. Frizell. Boston, Mass.; Published by the Author, 1897. Pamphlet. Pages, 46; illustrated.

A Practical Treatise on Hydraulic and Water Supply Engineering. By J. T. Fanning. New York; D. Van Nostrand & Company, 1896. Pages, 644; with tables and illustrations. Price, \$5.

A Text-Book on Roofs and Bridges. Part II. Graphic Statics. By Mansfield Merriman and Henry S. Jacoby. New York; John Wiley & Sons. London; Eng.; Chapman & Hall, Limited. 1897. Pages, 234; illustrated. Price, \$2.50.

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.

Metallurgical Chemistry in Mining Schools.

Sir: I have read with very much interest the letter of Mr. Percy Williams in your issue of May 15th. The article finds in me a sympathetic reader, but I can hardly agree with all of Mr. Williams' views of the matter. It has also been my good fortune to have been associated in practical work with the "green graduates" from several of our technical schools; and, further, it has been my fortune to have assisted in the preparation of those "green graduates" from one mining school. Having myself gone direct from college to one of the laboratories of the Illinois Steel Company, where each man finished as much work in one day as we had been taught to finish at college in two weeks, I was struck with the fact that my college training did not include instruction that would enable me to take charge of the regular routine work of an iron laboratory. The fact that our college laboratory had not been equipped for this kind of training was equally apparent; and I determined then and there that if ever I should have the opportunity of instructing young men in metallurgical chemistry, I should introduce into their course a line of work found in no college curriculum, and a line of work that was given at no college so far as I knew. It was not long before this opportunity was given me; I was placed in charge of the course in Technical (Metallurgical) Chemistry at the Michigan Mining School. It was not until then that the difficulties of the proposed course became apparent. In the first place it was absolutely impossible to require this work of the men who were candidates for the degree of mining engineer; they had not time for it and this is true of any college giving that degree. To carry out the plan of fitting a young man to take up the laboratory work of a smelter, he must complete the regular courses in qualitative and quantitative analysis, and, as Mr. Williams says, spend his last year in special lines. This would mean that at least one-half of the four-year course would be devoted to chemistry, an impossibility for a mining engineer, and a plan of doubtful propriety for a metallurgical engineer. This leaves such a course open to a comparatively small number of stu-

dents. The first difficulty encountered, then, is that there are very few students in our mining schools who feel that they can devote such a large portion of their time to chemistry.

The second difficulty lies in the fact that only a very few students know exactly what line of work they will follow after leaving college. Graduates are creatures of circumstance; the laboratory or smelting works where the graduate may be engaged is not of his choosing; he merely takes one of the first positions he finds open. In no two laboratories are the methods and conditions the same, each smelter having some plan of work that is best suited to its own surroundings; the details as carried out in one are quite different from those of another laboratory in the same district, though the methods of each may be equally good and rapid. Then in which particular line of work should the student study the rapid methods? It is obvious that he cannot take up all lines. The question is certainly a perplexing one.

A third difficulty one encounters is in the equipment of a laboratory for rapid work in a dozen or more different lines. Here is an almost impassable barrier. Anyone familiar with technical laboratories knows that each class of work, when carried on to the best advantage, demands a special and more or less expensive equipment. When it is explained to the financial managers of an institution that one, two, or possibly three students will be the maximum taking one of the proposed courses for which equipment is asked, but one reply may be expected, "There is not sufficient demand for the expenditure that you propose to make."

Another difficulty that presents itself, should all others be overcome, is that this kind of work demands incessant personal instruction. The professor must devote hour after hour to individual students. No amount of lecturing, lecture-room illustration, or written description will give the student that detailed knowledge of the method, will make him acquainted with those scores of little points that seem too trivial to mention, and yet upon which the rapidity and success of the determination depend. How many men could one professor instruct during one semester, especially if one were working on lead, another on copper, and a third on iron furnace supplies and products? Certainly a very few. Moreover, a professor able to give this instruction must be in constant touch with all of the latest methods; must not only know what is being done, but must be constantly practising with the new methods. A man who attempts to keep himself in touch with all of the technical laboratory methods will find that he has little, if any, time to devote to instruction. In other words, if the plan, of which Mr. Williams writes, were to be carried out successfully—and I wish that it might be—it would require a large corps of instructors, each a specialist in his particular line, with a laboratory equipped as none is at present equipped in this country.

Finding these difficulties presenting themselves, the writer conceived the idea that good results would follow if, after having completed the work in general quantitative analysis, the student were required to follow out the rapid methods with a number of samples in some one or possibly two lines. Being located in an iron country, and many of our students having an opportunity to find employment in the mines as chemists, I naturally selected a course in the analyses of iron ores, for the purpose of illustrating rapid methods. The course in assaying of gold, silver and lead ores was also conducted on the same lines. In this work the rapid methods were first given and after satisfactory results had been obtained, a set of samples were given out to be analyzed and reported against time. In the case of the iron ores, I required duplicate reports on iron, manganese and phosphorus and single reports on silica from four samples of ore. The samples were given out at 8:30 a. m., and the reports were in by 5:30 p. m. the same day, thus requiring 28 determinations, all of which should check my own determinations within a reasonable percentage. To be sure this is not nearly so large a number as one man makes in some laboratories to-day, but at that time and with the methods then in use it was considered a good day's work.

The result of this method was eminently satisfactory. Those men who went from our laboratory to the iron ranges were as well able to carry on the work expected of them as were those men who had had their training in the laboratory of some other iron company. When entering laboratories where other classes of work were done, they were not overwhelmed with the amount of work that they were expected to do. They had done some work on all of the methods used; they knew how to keep a number of determinations going at the same time without getting them mixed; they were not confused with the large amount of apparatus, and it was only a matter of a few days, until the system in vogue was understood, before the "green graduate" became an old hand.

The example cited by Mr. Williams is overdrawn, for no sane manager is going to place a new man in a position where he can do so much damage in so short a time, unless some misrepresentations have been made by some one. The student is rarely called to fill anything more than a subordinate position for a large establishment, and it usually happens that he has plenty of time to familiarize himself with the methods used without serious consequence to his employer.

If we are to teach metallurgical chemistry in our colleges, of what must that course consist? Shall we teach chemistry or will it be cookery? The latter term is used advisedly. When we permit the student to use his time for the acquirement of skill in one particular line, if he spends the whole of his senior year, as has been suggested, on furnace laboratory methods, he is doing what may be very properly called "cook book" chemistry. He is not studying metallurgical chemistry; he is fitting himself to fill the position of a very cheap sort of a chemist; in fact, a position that may be filled just as well (so far as the management can see) by any bright young man who has worked up from the position of sample grinder.

In conclusion I would say that Mr. Williams was right in saying that many of our college graduates lack entirely one line of training, but this line of training cannot have the prominence in the college course that he suggests. While it would be highly advantageous to the smelting works that our colleges prepare men to take up the "regular routine work," it is certainly impracticable with the means at the disposal of any of our American colleges, and it is doubtful if any of the smelters would pay the salaries that such men should receive were they properly prepared. No college can take the place of the mining district where the young man receives his hard knocks. Bruises will come sooner or later, and if his college tells him that he is ready to go in and take a responsible posi-

tion, those knocks are going to be felt much more than they otherwise would.

Until some worthy benefactor of mankind bequeaths his millions to an institution where laboratories, similar to those found at our best smelters, may be erected and placed in charge of competent professors, until then the smelting works of our country must continue to be considered as "post graduate institutions" for our metallurgical chemists.

FREDERICK FRALEY SHARPLESS.

MINNEAPOLIS, MINN., May 18, 1897.

THE MINERAL PRODUCTION OF ALABAMA.

The mineral production for the State of Alabama for the month of April, as reported by Dr. Eugene A. Smith, State Geologist and Secretary of the Alabama Industrial and Scientific Society, was as follows, comparison being made with the similar figures as reported for January, February and March:

	January.	February.	March.	April.
Coal.....	Tons. 427,279	402,726	580,364	382,462
Coke.....	" 94,414	96,343	84,529	108,015
Iron ore.....	" 165,891	214,135	160,000	245,508
Pig iron.....	" 75,440	59,794	60,126	81,824
Limestone and dolomite for flux.....	" .....	.....	19,252	20,200
Bauxite.....	" .....	.....	542	879
Lime.....	" .....	.....	6,000	.....
Building stone.....	Cu. ft. ....	.....	3,000	12,000

The pig-iron production was larger than for any previous month, and the same may be said of coke and iron ore. There were 13,500 men reported as engaged in the mineral industries in April. The reports collected under Dr. Smith's charge are proving both interesting and useful.

Blast Furnace Gases for Gas Engines.—The Société John Cockerill at Seraing, Belgium, about a year ago put up a gas engine which has been run with gas taken from one of the blast furnaces, which had previously been wasted. The experiment has proved so satisfactory that the company has ordered two engines of 150 H. P. each to be run in the same way.

Composition of Dynamite.—The possibility of dynamite or blasting gelatine becoming influenced by heat increases with the number of constituents that enter into its composition, according to Mr. Oscar Guttman, in the *London Engineer*. Although it may be thought that in dynamite the nitro-glycerine only has to be taken into consideration, yet it was found some 12 years ago that with perfectly good nitro-glycerine and what was apparently excellent kieselguhr a good dynamite could not be made. On examination it was shown that the kieselguhr contained, besides traces of iron and charred organic matter from calcining, comparatively large amounts of aluminum sulphate. Even a small quantity of this proved to have a decomposing action on the nitro-glycerine, with the consequent development of nitric peroxide.

Subsidies for Iron Making in Chile.—The National Association of Manufacturers informs us that its resident agent in Valparaiso, Chile, has called attention to a misleading statement concerning the offer of a subsidy for the establishment of iron works in Valparaiso, mention of which has been made in several papers during the past three months. It has been stated that the Chilean Chamber of Deputies passed a bill guaranteeing the payment of £25,000 to any company that would establish an iron foundry and shops on a large scale. The fact of the matter is that the Chamber of Deputies only passed upon certain clauses of a concession petitioned for by Sr. Manuel Francisco Irrarazaval, and then adjourned leaving the matter for the next Congress to debate. The association brings this matter to public attention as it has learned that several manufacturers in the United States have endeavored to get in communication with the people who are interested in the proposed works.

A Hydraulic Apparatus for Breaking Down Coal.—At a recent meeting of the Manchester Geological Society Mr. James Tonge read a paper on this subject. The apparatus described was what was called a hydraulic cartridge. It consisted of the cartridge proper, 18 in. long, 3 in. diameter, made of special steel and weighing 30 lbs., and a small but powerful hand-pump of special construction, fitted with a pressure gauge and light adjustable stand, weighing 20 lbs., so that the total weight was 50 lbs. The mode of using it was as follows: The coal was holed underneath to the usual depth, and a hole drilled near the roof to about the same depth as the holing. When this had been done the cartridge was put in the hole and pushed to the back, no stemming being required. The pump was at once coupled to the cartridge, the suction pump placed in a small bottle of water and work commenced. In a few seconds the cartridge was charged with water, the pumping being easy, and only a short handle being used, but when the pressure came on a longer handle was slipped over the short one. In a very little time the gauge began to show the rising pressure, and during this time a cracking sound behind the cartridge had been telling that the pressure shown on the gauge had had the effect of shearing off the coal at the back, the sprags, or holing props, being kept in their place in front. The gradual way in which the work was done, without shock or jar of any kind, prevented the least damage or injury to coal or roof, in striking contrast to the action of explosives of any kind. The time would vary with the varying conditions of the mines. The test so far had occupied on an average something under 12 minutes, which included placing the cartridge in the hole, connecting to the pump, getting down the coal, withdrawing the cartridge from the hole and getting to the next place. The holes, so far, had been placed slightly farther apart than in the case of blasting, hence a slightly greater quantity of coal had been brought down at each operation. The experiments had yielded, as compared with powder and other explosives, larger and stronger coal, which meant a better average price; no interference with the working of the pit, the coal being got down whenever required; no damage to roof; no dust; absolute safety from the dangers attending shot-firing.

CHARGING OPEN-HEARTH FURNACES BY MACHINERY.

By Jeremiah Head.

In this paper, read before the Iron and Steel Institute of Great Britain at its recent meeting, Mr. Head says that for every ton of steel ingots produced in the open-hearth furnace, it is necessary to handle and put in the furnace 24 cwt. of material. In a modern plant a 40-ton furnace is usual, for which each heat 48 tons must be handled. To reduce the time and labor machine work is a great advantage.

Mr. Head refers at length to the machines designed by Mr. S. T. Wellman, for the Otis Steel Company, at Cleveland, O., and the steps by which this machine has been gradually improved up to the present time. The newest type of this machine, operated by electric power, is shown in Figs. 1, 2 and 3, given herewith. This machine has just been made by Mr. Wellman for the Otis Steel Company, so that that company now possesses the most recent as well as the oldest and two intermediate examples of charging machines. Fig. 1 shows a cross-section of a furnace, the charging bogie with a charging box upon it, and the charging machine itself. Fig. 2 shows the same in plan, and Fig. 3 in back elevation. The apparatus has much in common with those which preceded it, but is,

bar, and all connected therewith toward or from the furnace by operating on the front axle and wheels.

The charging bar is hollow throughout its length, and the interior is occupied by a steel rod connected with a lever on the operator's platform. When the front end of the charging bar has been lowered into the socket of the box, the operator, in order to lock them together, pushes forward the locking bar by means of the lever, until the front end projects into a recess provided for that purpose in the socket of the box. A reversal of the process releases the box. The front portion of the charging bar is separate from but keyed to the back portion, so as to facilitate renewal in case of wear or accident.

The motor and gear for moving the machine longitudinally is upon the main carriage, and, as in the case of the charger truck, acts on one axle only. The motor and gear for twisting the charging bar is upon the operator's platform, as are also the controllers and switches for all the motors. The accumulation of these weights in that position balances to some extent the weights lifted by the charging bar. It will be noticed that in this machine the operator is always opposite to his work, and moves to and from the furnace with the charging bar and box. He is therefore able to see into the interior of the furnace when depositing materials therein, and at other times remain in a cool place.

The motors for producing the requisite movements are each 25 H. P.,

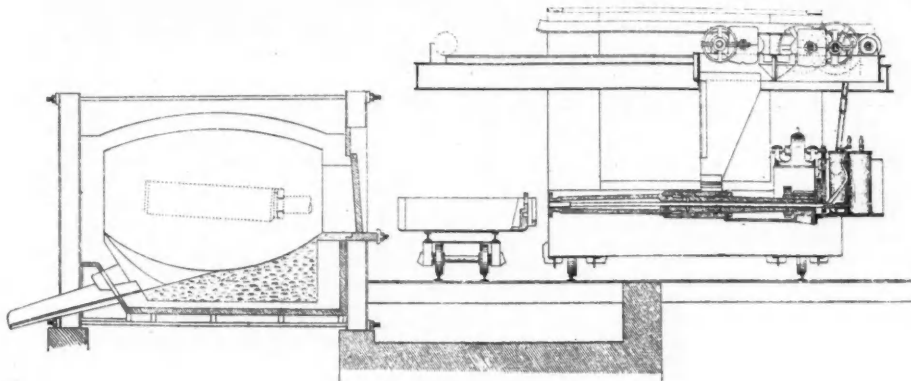


FIG. 1.

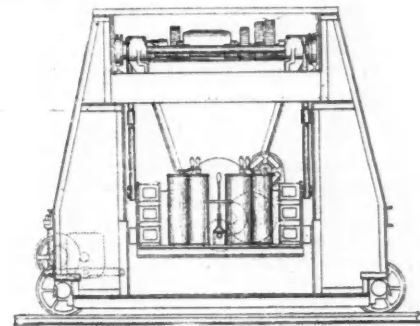


FIG. 3.

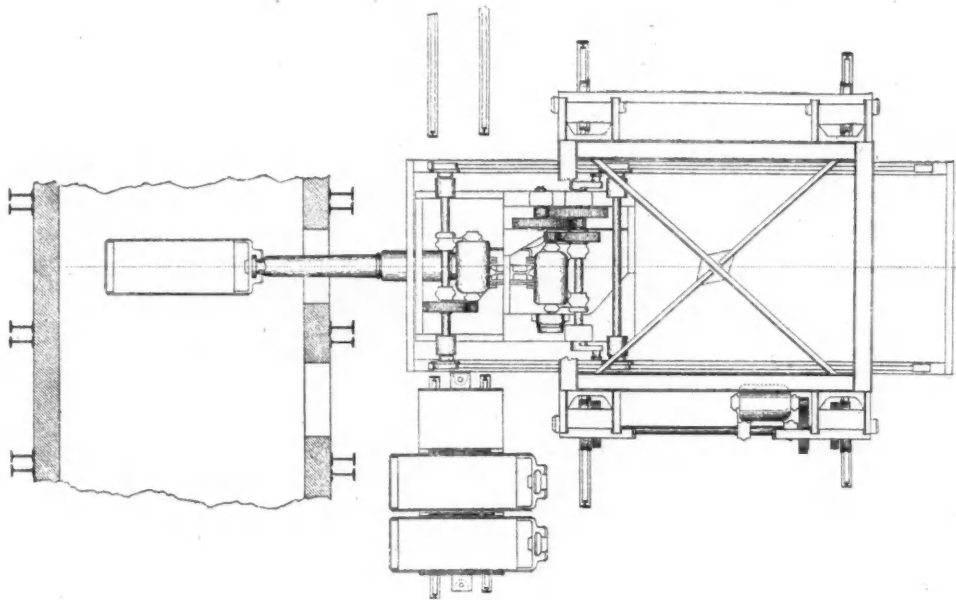


FIG. 2.

WELLMAN MACHINE FOR CHARGING OPEN-HEARTH FURNACES.

however, more substantial, while at the same time it is simpler and more compact. The main carriage is 5 ft. narrower from back to front than in the earlier machine, which is a great advantage in that less floor room needs to be kept clear. Stability is maintained by extending it 3 ft. longitudinally, an addition which interferes with nothing. At the four corners of the main carriage, box columns are erected which are surmounted by a framework, consisting in the main of a pair of channel section beams fixed transversely to the columns and projecting forward beyond the main carriage, almost as far as the furnace front. The channel beams carry rails on which runs on four wheels the charger truck. Above the wheels on either side are steel angles which serve the purpose on guard rails in case the truck should tip up behind.

Downwards from the charger truck projects a strong bracket, ending in double-eye bearings, which carry a trunnion sleeve. Into this sleeve is threaded and secured with a back collar the charging bar. On the after end of the latter is carried the operator's platform, the tail end of which is connected by two rods with the pins of two cranks, keyed symmetrically to a shaft running across the charger truck frame at its rear end. A motor carried on the truck is connected by gear with this shaft. By switching on the current the operator can rotate the crank shaft in either direction, and so move the charging bar up or down like a heavy gun in its trunnion bearings. As the motion is of the "all-round" type, no harm can come from overrunning. On the charger truck is also mounted a motor and gear for moving it and the charging

except that on the operator's platform for twisting the charging bar, which is only 3½ H. P. But as the maximum effort is seldom required in any of the movements, and as they are successive and not concurrent, 25 H. P. may be considered the maximum used by them all at any one time. The power continuously used does not in all probability exceed an average of 10 H. P. while the machine is at work. The electric current is brought from the central generating station. The current, which is brought by a single pair of conductors running overhead along the charging platform, is conveyed to the operator's platform by sliding contacts to be there distributed to the various motors. The new high-framed machine admits of the necessarily bare conductors and contacts being kept high up and well out of the way of the traffic on the floor. Little pressure is lost in transit, and no current is taken by the machine except when at work, and then only in proportion to the work actually done. The motors are of a simple type, encased in iron, like those in use under electric street cars. The current is a continuous one, and the voltage used is 220 to 250. The charging boxes are 6 ft. long by 2 ft. broad and 1½ ft. deep, which gives a capacity of 21 cu. ft. This is sufficient to contain a ton of ore or scrap and more than a ton of pig iron. Except when heavy castings and cobbles are to be dealt with, a ton is a convenient average load for a charging box, and three or four tons for a charging bogie, according to whether it is made to carry three or four boxes. If the boxes are properly loaded, the machine will pick up and empty one every minute, which is equivalent to

dealing with an entire charge of 48 tons in 48 minutes. Allowing 12 minutes for contingencies, a charge would occupy one hour instead of $3\frac{1}{2}$ hours, which is an ordinary time required for charging a 40-ton furnace, exclusive, say, of one hour for fettling. This would be required in either case. Thus a saving of $2\frac{1}{2}$ hours per charge is effected by the machine. The time gained per week is more than sufficient for an extra heat, or an increase in the total output of one-ninth, or 11%. The saving to be effected by using electrical charging machinery is not one of time only. At present eight picked men (two shifts) are employed (in British steel works) at each 40-ton furnace, and that these men handle among them 48 tons \times 9 heats = 432 tons of material every full week, the handling being done in 9 heats \times $3\frac{1}{2}$ hours = $31\frac{1}{2}$ hours. This is equal to 13.7 tons per hour while charging, or 3.4 tons per hour per man for a period of 15.3 hours per week. Now where the machine is employed, the whole of this heavy labor is done by it, and the material need never be touched by the men at all unless something goes wrong, or unless it be necessary at any time to adjust the position of any portion of the charge in the furnace.

An estimate made from information supplied by Mr. Wellman of the saving in cost of labor by the use of machine-charging as against hand-charging in two 20 to 30-ton furnaces in the United States is as follows:

WEEKLY LABOR COST, TWO FURNACES.

	With machine.		By hand.	
	No.	Cost.	No.	Cost.
Melter.....	1	\$30.00	1	\$30.00
First helpers.....	1	16.20	2	32.40
Second helpers.....	1	14.40	2	21.60
Machine operator.....	1	15.40	1	15.40
Stockers.....	2	14.40	6	58.32
Yard loaders.....	2	5.40	1	5.40
Boy.....	1	5.40	1	5.40
Total, single turn.....	6	\$81.40	12	\$147.72
Total, double turn.....	12	162.80	24	295.44

The total number of men employed per turn in machine charging is 3 for one furnace and 6 for two furnaces.

Nothing is deducted for wear of cars and boxes, as it is not estimated that this will be any more than that on the barrows, tools and cars used in handwork. Ten heats per week is assumed with hand charging and 11 with machine-charging. The machine and its operator are charged to two small furnaces, whereas they could easily work six large ones. Taking 40 working weeks only as a year, and allowing 16% on the cost of the machine for interest, depreciation and repairs, the savings by each machine appear to be \$4,107 per annum. This estimate takes no account of the gain in lower establishment charges by increased output. If we take the output of the two furnaces at 500 tons per week with hand charging, and 550 with machine charging, we shall find that by the former method the labor costs 60c. per ton of ingots, and by the latter only 30c. per ton.

One machine will easily serve six furnaces. But bearing in mind the possibility of a breakdown, and the serious loss which might result therefrom, it is recommended that they should be used in pairs—that is, one to each six furnaces at work, and one in reserve.

The effectual employment of a charging machine is dependent upon the materials being brought in charging boxes on specially constructed bogies to the charging platform, between the machine and the furnace front. The best arrangement is that shown in the diagrams, the full bogies arriving in succession at one end of the platform, and the empties leaving at the other end. They are supposed to have been loaded at the stock heaps or sidings, and to be returned straightway thereto. Charging platforms where machine charging is in operation are free from stocks of materials, standing wagons and other impediments to a remarkable degree, and their coolness and cleanliness is at once remarked by those accustomed to hand charging.

The charging bogies may reach the platform level by an incline fitted with a continuous creeper, which is an excellent device, and they may descend the same way, or be pushed up by a small locomotive, or be raised by lifts. Where, as in some works, it is difficult to make these arrangements, the materials may continue, as previously, to arrive at the back of the platform and be there loaded into the charging boxes on bogies. These, by aid of a few small turntables (such as are common at collieries), can easily be pushed round by hand to a position where the charging bar can operate upon them. The charging machine itself is frequently used as a locomotive to push away empties and bring forward full bogies.

In the United States the furnace doors are usually lifted by hydraulic or pneumatic power, operated by a boy in a pulpit at the back of the platform. One boy works the door for two furnaces.

For loading broken castings and heavy cobbles such as waster ingots, the machine may be used with great advantage. In that case the cobble would arrive on a charging bogie in the usual way, but the charging boxes would be dispensed with, and a broad fork having a socket shank would have been placed upon the bogie before the cobble was loaded up. The machine would lift the fork with the cobble on it and introduce it into the furnace just as if it were ordinary material. In case the weight of the casting or cobble were sufficient to over-balance the machine, the stability of the latter might be largely increased by depositing pig iron in the back box columns of the framework.

Charging machines are now in regular operation at the Otis Steel Works, Cleveland, O.; the Homestead Works of the Carnegie Company, at Pittsburg; the Illinois Steel Works, South Chicago; the Cambria Iron Works, Johnstown, Pa. In Germany there are two or three examples, but they are believed to be all of the older type, or closely allied thereto. In Great Britain none are yet in operation, but two have been ordered by the Llanelli Steel Company, of Llanelli, and these will probably be at work in the course of the autumn.

Petroleum Fuel in Russia.—The use of liquid fuel is extending in the mines and mills of the Oural region. It has recently been adopted by Ust-Katoffski Iron Works, and in the iron works at Zlatoust. At the Miniarski Works, in the Szimski district, oil is now used for heating the puddling furnaces, and for all purposes except in the blast furnace, where charcoal is used.

AN ENGLISH MINE ACCIDENT.

An accident occurred on May 10th at the Snaefell silver-lead mines near Laxey, in the Isle of Man, which attracted much attention in England, owing to some of the attendant circumstances. It appears from the accounts that the mine was not worked on Sunday, May 9th, and the last shot fired was at 1:30 p. m. on Saturday. From that time till 6 o'clock Monday morning no one had any occasion to enter the mine, but when the men went down the shaft at 6 o'clock it was found to be filled with poisonous fumes and the air was intensely hot. There were no flames, and it was impossible to see what was the cause of the fumes which filled the place. The result, however, was that as each man descended he was overpowered, and no fewer than 19 went down the ladders before it was found that anything was wrong. Three men came up the shaft nearly fainting and said there was something wrong with the air. No answer could be got from those who had gone down. Rescuers at once set to work, but owing to the deadly fumes they could get no further than the 50-fathom level. At 11 o'clock one of the explorers was brought up in an unconscious state, and it was feared he would not live, but he regained consciousness at 2 o'clock. A large gang of men arrived to help in the rescue. Five men proceeded down the shaft at 2 o'clock, and reached a man at the 60-fathom level. He was alive, but unconscious. All the other men were deeper down the shaft and were subsequently found dead. Captain Kewley, of the mines, acted with conspicuous bravery. In the face of the doctor's orders, he continued to descend the mine time after time with exploring parties, and went down 10 times in all at the risk of his life.

In the investigations undertaken immediately after the accident, Dr. C. Le Neve Foster, Chief Inspector of Mines, very nearly lost his life. The accident occurred on Monday, and on Saturday Dr. Foster, according to the account given in the *London Times*, undertook to test the atmosphere between the 115 and 130 levels in the mine, where the disaster had occurred, with a view to ascertaining if it were possible to recover the only body, that of Robert Kelly, remaining in the workings. The candles sent down alight burned brightly at 115 fathoms, but were extinguished at 130 fathoms. At noon, a party consisting of Dr. Foster, Mr. G. J. Williams (Assistant Inspector of Mines), Captain Raddcliffe, Captain Kewley and eight others descended the shaft. Some of the party proceeded to the landing at the top of the ladder, at the foot of which the body was lying, and were able to get within 12 ft. of the body without being seriously affected by the gas. Dr. Foster then tested the air below, and as it was found to be very poisonous, he ordered that no man was to descend further. Captain Kewley, however, volunteered to attempt a further descent, and went down a step or two on the ladder with grappling irons, which he gently lowered and then swung to and fro to try to catch the clothing of the body. As soon as the air was disturbed by the swinging the gas began to rise. Capt. Kewley was at once overcome, and was hauled back to the landing. Those above were also affected seriously by the gas, but managed to get Capt. Kewley into the box, and rang the signal for it to be brought to the surface. The box became jammed in the timbers of the sheathing at the 105 level, and for over one hour could not be moved. In the meantime all those below had given themselves up for lost. After ringing continually for assistance, those of the party who still retained some energy managed to climb to the surface, arriving there in a hysterical condition.

All the responsible mine officials were in the shaft, and only Dr. Miller, the medical officer, was in charge of the handful of men who had gathered at the shaft's mouth. It was with the greatest difficulty that a competent rescue party could be got together, as there were few miners present, but every one volunteered and a party of 16 proceeded below. Captain Kewley was at length brought above ground, the box having been cleared by the relief party, and then the remainder of those of the first party who had not been able to reach the surface were one by one sent up in the box, some of them unconscious and others in an excited and hysterical state. All were rescued, Dr. Foster being the last to go up. His first act on reaching the surface, before he allowed the doctor to treat him, was to make his final entry in his note-book, over 30 pages of which were covered with notes on the course of events below, made while he believed himself to be dying. In less than an hour most of the sufferers were able to go to their houses. The government inspectors were driven to Laxey, Dr. Foster fainting on the way.

Dr. Foster continued to make notes and record his feelings and the surrounding conditions all the time that he was imprisoned in the mine, although at one time there was apparently little or no hope of escape. It was a very unusual experience.

New Process of Steel Manufacture.—Mr. John Gjers, of the Ayresome Ironworks, Middlesbrough, England, who has patented several inventions relating to the manufacture of iron and steel, has introduced another. The object of the new process is to cheapen the cost and improve the quality of steel or homogeneous iron. Mr. Gjers proposes that the pig iron shall be melted upon the bed of a furnace lined with ilmenite or with some other rich oxide of iron, but the operation of steel-making itself will be carried out in an ordinary open-hearth furnace.

Moving a Large Chimney.—At Shelter Island, N. Y., recently the firm of W. H. & C. P. Topping performed successfully the feat of moving a large chimney, says *Power*. This chimney, which is 85 ft. high, 7 ft. square at the base and 4 ft. 6 in. at the top, with a 30-in. flue, weighed about 100 tons. It has an 8 in. wall on the outside and an 8-in. round inner wall for the flue, connected with the outside wall by three or four bricks every 10 ft. It was moved about 1,000 ft. over very rough ground. Starting from the old site, the first 100 ft. was up a grade of about $3\frac{1}{2}$ ft. The cradle rested on two skids greased on the under side and sliding on greased blocks. A chain purchase was used, with one horse on the capstan, the ratio of movement being 150 to 1. There were four men employed in the moving. The chimney was owned by the Manhasset Improvement Company.

THE PEARCE MINING DISTRICT, ARIZONA.

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

Within the past year Cochise County, Arizona, has come to the front with a phenomenally rich mine, the Pearce. It is located on one of the outlying hills beyond the easterly slope of the Dragoon Mountains. While these latter show a core of metamorphic rocks, flanked by copper-bearing carboniferous limestones and traversed by intrusions of porphyritic character, the more or less isolated hills and ridge-shaped buttes to the eastward apparently belong to the trachytic and rhyolitic series. The structure of the upper portions of these rocks is, to some extent, columnar, and, consequently, the hillsides are heavily covered with detritus and angular fragments of rock, the results of disintegration. At a number of points, however, in spite of this covering, quartz veins protrude above the debris, standing out prominently by virtue of their uniformly hard character and pronounced thickness.

At various places, on the surface, as well as underground, these veins show a meandering or geodic structure, comparable to that of agates. This leads me to infer that these portions may owe their existence to secondary infiltration and the comparative barrenness (so far as ore is concerned) of the silicious deposits as well as their separate inclusions of specific, metal-bearing minerals support this view. In strike as well as dip the veins of the district show a certain similarity, the former being north of west, the latter ranging from 60° to 80° to the southward.

Thus far the main development centers in the Pearce mine, located at Pearce Camp, a settlement of perhaps 800 souls. To the northeast, near Stockdale, is the Gold Cliff and to the west of Fittsburg is the Six-Mile-Hill Groups. The first named was located March 10th, 1895, worked in a desultory fashion by the Pearce Brothers, subsequently bonded by Philadelphia capitalists, and on January 1st, 1896, passed into their possession under the name of the Commonwealth Mining Company with a capitalization of \$2,000,000. Active work was commenced under the management of John Brockman from New Mexico, who selected Mr. Towmey, from the same Territory, as his superintendent. Shipments of ore were started about July, 1896.

The vein crops out for more than 3,000 ft., and exhibits the characteristics above noted. Three shafts are sinking, the deepest reaching 300 ft. They are served at present by horse whims, but connection between them is being now made, and the main shaft is being prepared for an inclined cage from Fraser & Chalmers. At an early stage of the mining work it was found that the vein presented unusual dimensions, and it is claimed that the footwall has not yet been reached, although ore has been developed to a thickness exceeding 60 ft. A remarkable circumstance lies in the fact that nearly all of this material is of shipping grade. As an instance it may be stated that on the lower level four gangs are working abreast (about 16 ft. front). The ore is hoisted directly into storage bins, without any kind of sorting, loaded into wagons and started on its way to smelting works at Pueblo, Colo. Whoever is familiar with the costs of teaming, railroad freight for about 750 miles, and treatment charges on dry ores can readily understand that the ore must carry appreciable values.

The rich chute from which this ore comes has now been exploited for a horizontal distance of 390 ft. on the vein, for a depth of about 300 ft. and for an undetermined thickness ranging from 16 to upward of 60 ft. From the surface down no sorting has been done, nor are any waste-dumps in sight. The lower grades of ore, which form an inconsiderable minority, are reserved for treatment in a mill now building. For the past six months the shipments show a monthly average of about 2,000 tons. Many guesses have been made as to the value of this ore, but they are not reliable. From the best information obtainable, I should place the monthly output at upward of \$250,000.

The ore itself is quartzitic, somewhat ferruginized. It carries both gold and silver, the latter in the form of chloride (cerargyrite), bromide (bromyrite), chlorobromide (embolite), sulphide (argentite) and some iodide (iodyrite). Gold occurs native in broad splashes and leaf form, and I suspect the presence of decomposed tellurides. In the upper levels the proportion of silver to gold was about 2½ to 1, but in the lowest workings it has gradually changed to about 1:1. Apparently the highest values follow the hanging wall, where streaks, veinlets and inclusions, assaying heavily in silver, have been encountered. These occurrences I am inclined to connect with secondary infiltration. Remarkably fine crystals of the above-named specific silver minerals are found, and in one instance a druse lined with wulfenite, incrusting with embolite, was struck.

The company has proceeded cautiously and thoroughly explored its ground before deciding upon reduction works. At present a mill is building which will have 40 tons' daily capacity, capable of ready expansion to 80 tons and comprising the following appliances: The ore is first crushed in a pulverizer, thence passes to amalgamating pans, from these to settlers and receives final treatment on Frue vanning machines. The tailings later on may or may not be subjected to some leaching process. The power is steam. Water is scarce, and the company is sinking a well of large dimensions to obtain an adequate supply. At present there are 84 men on the pay roll, of which, however, only about one-third are employed underground.

From present developments it would seem that the chutes within the veins were, in this district, of unusual dimensions proportionate, probably, to the thickness of the vein. It remains to be seen whether, in turn, they will be correspondingly separated from each other as to horizontal distances. This is an important question for those who are working smaller veins, but the chances are that the size of rich chutes and the spaces of low-grade or barren ground separating them will bear some definite relation to the persistency and transverse measurement of the vein containing them.

At the Gold Cliff mines not sufficient work has been done to develop a paying chute, but the mine is now being properly opened at a depth of 175 ft. A company of Los Angeles and Tombstone men, with George H. Fitts, of the latter place, as president, has acquired this property and is working it in a judicious manner.

The Six-Mile Hill Group is largely owned by Mr. Fitts. A depth of 70

ft. has been attained in the workings and several rich bunches of ore have been encountered. Further development will probably result in the establishment of a pay chute, as both here and at Gold Cliff the general features and surrounding of the veins are closely allied to those of the Pearce.

Taking it altogether, the district is one of exceptional interest, apart from its metallic wealth. The proximity of the Dragoon Mountains with its copper mines, the absence of copper at Pearce, and the sudden appearance of high-grade silver ores, form a combination that leaves ample room for speculation upon the distribution of varying mineral compounds in large quantities within a circumscribed area.

SOME GEOLOGICAL FEATURES OF RHODESIA.

Written for the Engineering and Mining Journal by George Jenkins.

The whole of the rocks of Rhodesia, with the exception of those forming dikes along the gold belts, are of a sedimentary character, nearly all of which are of argillaceous origin. Feldspathic, granitic rocks, with little or no quartz in their composition, form the great water-bed of the country, from which the water flows either north and east into the Zambesi River, or south and east into the Limpopo River. These granite rocks are of two ages as far as I am able to judge, those of the archæan age being either true granite or syenite, and those forming the remainder, which are of the lower silurian age, being made up of gneiss and syenite chiefly. These rocks contain many mineral-bearing quartz veins, but they are seldom of any commercial value.

The rocks of the upper silurian age are made up of chloritic, mica, foliated and talcose schists. These rocks occur along the edges of the granite rocks, and generally form long mountain ridges and have the appearance of having been tilted almost to a vertical position. They are highly laminated as well as metamorphosed. It is in these rocks that the ancient mines are found to be most plentiful. They are found in true fissure quartz veins which traverse these rocks for many miles in length, running parallel with the formation. Generally near the veins, and sometimes forming one of the walls, large dikes of igneous rocks occur, which also run parallel with the veins and the formation. In some localities these rocks are very hard, while in others they are very soft, in fact so soft that shafts are often sunk to a depth of 40 ft. without once having to blast the rock. In these rocks the veins are very numerous, and in the Selukwe District the whole of this formation appears to be a mass of veins only a few yards apart, and although the main veins run in a northerly and southerly direction, there are veins running in every direction, running through and across one another. The ores occurring in the ancient mines found in this formation are generally of a fairly high grade, and the ore bodies are of considerable length.

The rocks of the Devonian, as also of the lower carboniferous age, are made up chiefly of argillaceous slates, which are generally of a calcareous nature. They form large rolling plains, which are traversed by huge igneous dikes and mineral-bearing quartz veins. In the latter there are a very large number of ancient mines. As in the formations of the upper silurian age, these veins are true fissures, and the ores are generally of a fair grade, and the ore bodies are of considerable length. Outside of the above formations, so far as I am aware, very few mines of any value have been discovered.

Although there are a large number of veins in which the ore bodies are of considerable length, and the veins of a good thickness, there are a large number of ancient mines in which the ore body is very short, or the streak of gold-bearing quartz which occurs upon one of the walls, generally the hanging-wall, is so small that it will be impossible to mine it at the present day to a profit.

Great care will have to be exercised here in the selection of mines upon which to place expensive machinery, and there is sure to be a large amount of money thrown away in the development of worthless mines. There are a very large number of mining claims in this country which have been floated by large companies in London upon which there is no possible hope of finding a profitable mine; yet, in spite of this fact, a very large percentage of the total claims pegged will be sure to turn out good mines. Fully 25% of the claims that I have inspected have good prospects. These claims are scattered over all parts of Matabeleland, and form a very fair average of the total number of claims pegged in this country. Some of the mines are extraordinarily rich in gold, and the ore bodies are of unusual length. The richest of the ores contain a small percentage of silver, and sometimes a little copper and galena. Upon the whole they are of a fairly free-milling character, and will present very few difficulties in their reduction. Most of the gold-bearing districts are fairly well timbered with a very good quality of mining timber; there is also abundance of water in nearly all of the districts.

The Institution of Mechanical Engineers of Great Britain.—This institution will celebrate its jubilee at Birmingham in July, when the president, Mr. E. Windsor Richards, will deliver an address which will deal with the history of the institution since it was founded by Stephenson 50 years ago. During that time many things have happened in the world of mechanical engineering, so that it would be natural to look for a very interesting address.

Coal in the Caucasus.—In the course of a report to the British Foreign Office on the trade of Batoum for the year 1896, Consul Stevens states that the consumption of Caucasian coal, which is procured exclusively from the coal-fields at Kvibul, is for the present making but little headway. This coal apparently does not possess the qualities required to enable it to successfully compete with the coal procured from the mines of the Don Basin. It is not anticipated that the limited demand for coal in the Caucasus, where both wood and naphtha fuel are so cheap, would ever admit of the industry being developed into a profitable undertaking. It would appear that as soon as this coal comes in contact with the air it crumbles to pieces. This led to the idea of manufacturing it into briquettes, which has been a successful experiment.

ABSTRACTS OF OFFICIAL REPORTS.

Hauraki Gold Mining Company, New Zealand.

This company's report for the year ending December 31st, 1896, shows that the returns from sales of gold were £83,445; interest, etc., £1,069; total, £84,514. Payments were: Expenses in New Zealand, £25,325; expenses in London, £3,065; dividends—160% on stock—£64,000; income tax on dividends, £2,134; total, £94,524. The excess of payments was £10,010. The balance on hand at the beginning of the year was £17,185; deducting the excess above, left a balance of £7,175 forward to current year's account.

The total amount of development work was 9,593 lin. ft., of which 129 ft. was shaft sinking. The total ore treated was 4,425 tons, yielding 27,121 oz. gold, or 6.25 oz. per ton. At the value given for the gold this was equivalent to 19,647 fine ounces. The total return was \$91.77 per ton; total expenses, \$30.89; leaving a profit of \$60.88 per ton worked.

During the year the company parted with the section of its property known as the Golden Pah to a new company, receiving £30,000 in cash and shares.

Consolidation Coal Company, Maryland.

This company owns a large coal property in the Cumberland region, and also owns and works the Cumberland & Pennsylvania Railroad, which is the chief outlet of the region. The report is for the year ending December 31st, 1896. The total receipts from mines, railroad and rents were \$1,690,901; operating expenses, \$1,062,322; net receipts, \$628,579. Deductions charged are: Interest on debt, \$116,000; amount carried to royalty fund, \$69,945; sinking fund, \$25,000; dividend, 2% on stock, \$205,000; total, \$415,945; leaving a surplus for the year of \$212,634.

The capital stock of the company is \$10,250,000; its funded debt amounted at the close of the year to \$2,100,000. The report of the president, C. K. Lord, says in part: "The coal tonnage handled by your railroad during the year amounted to 2,416,542 tons, an increase of 239,248 tons over that of the preceding year, being, with the exception of the year 1888, when it amounted to 2,424,848 tons, the largest in its history. The total output of your mines in 1896 was 1,157,200 tons, an increase over the output of the preceding year of 233,545 tons, and an increase over the output of 1888, which up to the year 1896 was the largest in the history of the company, of 133,851 tons.

"Your company has no floating debt; moreover it is free from either construction or suspended accounts. During the year the company purchased for cash 200 modern coal cars under a car-trust agreement with the Baltimore & Ohio Railroad. The freight and passenger equipment have all been kept up to a high standard of efficiency. The same may be said of roadway and buildings.

"There was a large over-subscription for the \$600,000 bonds offered for sale in December last. The proceeds of this sale, together with \$500,000 in cash taken on January 1st, 1897, from your royalty fund, has enabled us to pay off at maturity the \$1,100,000 of outstanding bonds. Therefore our interest charges from and after that date will be reduced to the extent of \$39,000 per annum."

Oregum Gold Mining Company, India.

The report of this company for the year ending December 31st, 1896, shows that 63,888 tons of ore were milled, producing 55,162 oz. gold, and 59,461 tons of tailings were treated, yielding 10,413 oz., a total of 65,575 oz. gold. This bullion realized £246,645, showing that it was equivalent to 58,231 fine oz. gold. The expenses, including all office and general expenses, amounted to £125,903, to which is to be added £6,966 reduction in stores on hand, making a total of £132,869. The earnings were equivalent to \$18.84 per ton and the expenses to \$8.56, leaving a net profit of \$10.25 per ton of ore worked.

Mining work included 638 ft. shaft sinking; 5,310 ft. levels driven; 1,394 ft. winzes sunk; 292 ft. rising; 628 ft. crosscutting; 95 fathoms cutting plats; 5,429 fathoms stopping. The average number of men employed was 2,739, of whom 79 were Europeans and 55 Eurasians.

As compared with the results of the previous year, there was a diminution of 2,625 oz. from the ore crushed, and 2,149 oz. from the tailings treated, or together 4,774 oz. This is accounted for chiefly by a falling-off in the grade of the ore treated, which gave an average of 0.86 oz. of gold per ton, as against 1.09 oz. from the stone crushed for the preceding year; and 0.18 oz., as compared with 0.22 oz., from the tailings dealt with. The average monthly grade of the ore reached its lowest figure, 0.62 oz., in December last; and since the close of the year an improvement has set in. In January, 1897, the average yield of the ore treated rose to 0.68 oz., and in February it had further increased to 0.75 oz. of gold per ton. The accounts show that the amount received from sales of gold was £246,645, and after deducting royalty, £12,223, there remained the sum of £234,422; adding receipts from other sources, the income was altogether \$235,025.

The profit for the year amounted to £102,957, as compared with £128,910 for the preceding year, a decrease of £25,953. Sundry amounts, £7,296 in all, were written off the profits, including £2,500 which has been added to the reserve fund, bringing up the amount to the credit of that account to £7,500. The dividends for 1896 amount to 6s. per share on the ordinary shares, or 30%, and 8s. per share, or 40% on the preference shares.

The reports of the superintendent and mine agents show that the amount of work accomplished was hardly equal to that of the previous year, owing chiefly to an outbreak of cholera lasting between three and four months. Since August last, however, the camp has been free from pestilence of any kind. The directors resolved to send a contribution of 500 guineas from this company to the Lord Mayor's famine relief fund for India.

The ore reserves standing throughout the mine at the end of 1896 were estimated to amount to 63,266 tons, besides which there remained quartz broken underground amounting to 3,000 tons. The quantity of tailings remaining at the end of the year was estimated at 27,000 tons, an increase on the previous year of 3,945 tons.

The report says: "The results of the past year's operations have not

been as satisfactory as those of preceding years. The policy of the board, however, of maintaining the mine in a thorough state of efficiency as regards machinery and of keeping development work well ahead of extraction, thus adding to the reserves year by year, has enabled the returns to be very well kept up during a time when the absence of important discoveries might have resulted in a serious falling off in the monthly returns. During the past few months a distinct improvement has taken place in the prospects of the mine. The section of ground to the south of Taylor's Shaft is again opening up well, the lode being large and rich. The prospects at Low's and Probyn's Shafts also are better."

THE HONGAY-HATOU COAL FIELD IN TONKIN.

By F. Brard.

In a paper recently read before the Société des Ingenieurs de France, Mr. Brard says that these mines are located on the bay of Hongay in Tonkin. The mines are connected with each other and the shipping pier by a railroad of 1-m. gauge.

The coal is free from intermixed slates and contains 84 to 89% of carbon, 3.2 to 3.8% of hydrogen, 2.14 to 2.54% of oxygen, 0.63 to 1.07% of nitrogen, less than 0.5% of sulphur and 2.5 to 3% of ash. When coked the volatile matters given off range from 6.4 to 7%. It thus appears that Hongay coal is a close-burning semi-anthracite, and it is found in practice to be nearly smokeless. The low percentages of ash and sulphur are characteristic of all the coals of this district. When pressed into briquettes the Hongay coal showed a cohesion equal to 62%.

The Kestner shaft at the Nagotna mine, 3 75 m. in diameter, and 132 m. deep, was sunk under considerable difficulties, the only European on the spot having to superintend the sinking, blasting, engines and winch, day and night. The rate of progress attained by the Anamite workmen through sandstone and slaty ground was 19 m. in a month, one-third of that time being occupied in blasting, lining and cleaning out. For lining the shaft, the original diameter of which was 4.4 m., bricks 22 cm. (9 in.) long were used, the space between the lining and rock being filled with concrete (350 kilos of cement per cubic meter of sand). Two recesses of about 8 ft. wide, lined with masonry, are arranged in the shaft together with a third 8 ft. x 10 ft. x 10 ft. for the Worthington pump, which can raise 4,500,000 gals. of water per second to a height of 200 m. A downcast at an angle of 30° was driven from the surface into the Chater seam and connected with the shaft by a crosscut 70 m. in length, thereby affording a means of ventilating this seam, and a similar work has been commenced for ventilating the Bavier seam. The internal workings are served at vertical distances of 49 m. by haulage inclines, and at the surface—which is very irregular—there is an automatic incline constructed to collect the empty skips from the screens and raise them to a level above the pit mouth, leaving them to roll down a shoot to return to the latter.

At Hatou, which is 11 km. distant from Hongay, the main seam is from 45 to 60 m. in thickness, the actual coal being, however, only from 36 to 40 m., the layers being divided by beds of slate, though there is no vein of slate embedded in the coal; the smalls do not contain more than 6½% of ash, so that washing is dispensed with. The workings (open-cast) are divided into two fields, northern and southern, and the coal is taken out in straight cuts, the face being hollowed out below and the top brought down by wedging. In the southern section the earth covering the coal is removed by trenching and blasting, and also by an excavator, which is capable of breaking through bands of hard sandstone 8 or 9 in. thick. Where the slates and sandstones are thicker explosives are used. In fine weather and ordinary ground the excavator will move 250 to 280 cu. m. of earth per diem, and require 40 coolies to attend to the transport, etc. The workings are divided into an upper and a lower set, inclined carriers conveying the coal from each to the level of the shoot. The water in these workings is cleared by a Worthington pump raising 4,500,000 gals. per second; to work this pump are two boilers, both of which have to be kept under steam in the rainy season, but in the dry months only one is required at intervals during the day. The northern section is separated from the southern by a strip, hitherto unworked, which is traversed by a double tunnel 140 m. long, to which all the coal from this section is brought by inclined carriers, and which delivers the same to the discharging shoot; and also by an inclined plane carrier on the southern section, bringing down the coal from the upper stopes.

At the Hongay works the coal from the Hatou field is passed over four oscillating screens, worked by a 30-H. P. engine and dividing the coal into two classes—0 to 0.6 in. and 0.6 to 1.25 in. in diameter—the former of which will be worked up into briquettes on the spot as soon as the plant is installed. A briquette factory has also been erected at Kowloon (Hong Kong), where the coal is discharged on to a granite quay, 260 m. in length, alongside which vessels drawing 20 ft. of water can be berthed even at low tide. These works occupy a large area lying in a sheltered position, and the establishment is lighted by gas and provided with a special water supply. The coal and pitch are ground by a Carr disintegrator, and compressed into briquettes by two Middleton presses (double-acting). Mixing is effected by dry steam from a double-fire boiler, 8 m. long, and superheated in a special furnace. The briquettes measure 9 x 6 x 5 in., and weigh about 12½ lbs. About 80 tons can be turned out in a working day of nine hours. In order to obtain a suitable degree of cohesive power for firing purposes it is necessary to add 10% of bituminous Japanese coal, the anthracite then forming 79.5% of the mixture, dry pitch 9%, and tar 1.5%. The chemical composition of the briquettes is: Carbon, 74.61; volatile matter, 17.23; ash, 6.02, and water, 2.14%. At the new factory at Hongay, Couffinal presses are being put in, as they compress the briquettes more closely than the Middleton machine. It is proposed to procure the bituminous coal from the mines at Yen Bay, above Hanoy, on the Red River, and to experiment with California asphalt instead of pitch, as also with petroleum residuum from Sumatra, both of which are powerful agglomerants. The company is pushing its products in all the markets of the East, and expects during the present year to dispose of 130,000

tons, the prices f. o. b. Hongay being \$2.30 per ton for smalls and \$5 for screened coal. At present the capacity of the Hatou mine is 130,000 tons per annum, and that of the Nagotna mine 30,000 tons, but the output of the former can be increased by 25,000 tons every year.

FILLING AND REPLACEMENT IN GOLD-BEARING FISSURE VEINS.

Written for the Engineering and Mining Journal by Waldemar Lindgren.

Though many of the following remarks refer to mineral veins in general, they are intended specially to apply to those carrying a considerable amount of their value in gold. The materials in a fissure vein due to the vein forming agencies may be divided in two groups—(1) vein filling and (2) country rock altered by the metalliferous solutions. The term "alteration" as here employed involves "replacement" or "metasomatism." Though it is not in every case possible to strictly separate the two classes, yet it can be done as a rule. Many of the puzzling questions in regard to veins and vein filling may be solved if this distinction is made and carefully applied. Products of attrition often appearing in quartz veins generally belong to the second class of materials.

The vein filling is ordinarily formed of quartz, calcite and various metallic sulphides, crystallized in the open spaces along the fissures or seams. The altered country rock which may differ greatly in appearance from the fresh country rock in general is soft, light colored and more or less filled with metallic sulphides. It may occur both inside the fault planes forming the "walls" and outside of these, in the latter case gradually changing into fresh rock within a few feet. The filling of larger and smaller fissures usually forms the most valuable ore, but the altered country rock may also contain enough gold to be classed as an ore.

The Alteration of the Country Rock.—The various kinds of igneous rocks in which so many of the gold veins are contained ordinarily appear bleached in and near the fissure veins, the dark constituents disappearing, the feldspar altered to a soft white and opaque material, the quartz only remaining for the most part without alterations. The rock has often a greasy feel. Metallic sulphides, chiefly pyrite and arsenopyrite appear abundantly in the altered rock. This soft white material is very often designated as "talc" or "kaolin" and the rock is often said to be kaolinized. It is as a rule neither of these minerals. Kaolin is largely a product of surface decomposition, and is far less common than has been supposed in and along the fissure veins.

The most common process to which the ordinary igneous rocks and also some kinds of sedimentary rocks are subjected when acted upon by such mineral solutions as form fissure veins is a sericitization or replacement of the ferromagnesian silicates, the feldspar, partly also the quartz by sericite, a fine fibrous or felted variety of white mica, probably identical with muscovite. Often a carbonatization or replacement of the same minerals by carbonate of calcium and magnesium proceeds at the same time, and, by similar processes of replacement, pyrite and arsenopyrite, more rarely zinblend and other sulphides, are introduced in the rock, crystallizing in small but often perfect individuals. Along with the sulphides, gold is introduced, but usually only in small quantities. The sulphides of the altered country rock are, as a rule, decidedly poorer than those of the vein filling. The process is one of more or less complete metasomatism, involving a change not only in the mineral constituents, but also in the composition of the rock as a whole. Certain substances are extracted while others are introduced. It must be concluded that the constituents of the mineral solutions do not penetrate the rock equally, and that osmotic forces are here active, as first suggested by Mr. G. F. Becker, can hardly be denied.

Silicification.—Mr. S. F. Emmons has called attention to the fact that many, in fact the majority, of the vein deposits in the Rocky Mountain region do not strictly comply with the old definition of a fissure vein, but belong to types mentioned in a following paragraph; he has also stated that the ore chiefly occurs along the fault planes and seams, and that the rock in the vicinity has usually been subjected to a strong metasomatic action, and often forms part of the ore. That all of this is perfectly true must be conceded by every careful student of the subject. But since then many geologists and mining engineers have extended the theory of replacement, and speak of nearly every vein filling and even of veins of solid quartz as products of replacement. Against this view a strong protest should be made.

In case of carbonates, there may often be some difficulty in deciding as to what is filling and what is replaced country rock. For carbon dioxide and alkaline carbonates are very strong solvents attacking easily nearly every one of the rock forming minerals and forming pseudomorphs after them. The carbonates may replace a rock completely, wholly changing both composition and structure. As an instance may be cited the coarse grained mixture of carbonates and mariposite (fuchsite)—a chromium mica, resulting from the replacement of the serpentine along the Mother Lode of California.

As to quartz, the conditions are wholly different. A solution of silica is comparatively inert chemically, and does not easily attack any of the rock-forming silicates. Silicification may take place by two greatly differing processes: (1) Cementation or filling of the interstices of porous or shattered rocks by quartz deposited from solution of silica supplied to the rock from the outside; (2) Metasomatic silicification or a substitution of silica for other minerals, the silica either being produced by the alteration of the original minerals, or deposited simultaneously with the dissolving of the original mineral by active reagents in the water, causing the metamorphic action.

The first process is often observed in the silicification of various sedimentary, porous rocks, chiefly sandstones, or tuff or porous igneous rocks such as certain kinds of trachytes and andesites. When the walls of quartz fissure veins consist of such porous rocks, silicification by cementation may be expected. Silicification by the cementation of shattered rock masses by silica is of course a common occurrence in and near mineral veins.

But silicification by replacement is a less common process and is chiefly observed in the case of easily soluble rocks such as limestone and calcareous shales, where it results in fine-grained or cryptocrystalline aggregates of silica. In the metasomatism of bodies of massive rocks pene-

trated by chemically active solutions, silica is formed in many ways, as by the carbonatization of silicates and sericitization of the feldspars; if no open spaces are available, much of this free silica will be deposited within the rock, usually as fine-grained aggregates more or less mixed with opal and chalcedonite. If no material were added, the final result of this process would not, however, be a silicification strictly speaking, but merely an increase in the free quartz of the rock. But in case the rock masses are cut by fissures, it appears that, in many cases at least, the resulting free silica will not remain in the rock, but finds its way out in the open ducts, where, if the solution is supersaturated, it will be deposited. In fact, in the metasomatic process in the ordinary igneous rocks adjoining gold quartz veins, it has been shown that certain elements such as potassium are added to the rock, while others, notably silica, are frequently carried away.

As for the other possible process, that is a complete dissolving of the original mineral and a deposition of silica *pari passu*, it chiefly occurs in easily soluble minerals, such as calcite; in case of the ordinary rock-forming silicates, it is apparently not common. The resulting silica is generally in the form of fine, cryptocrystalline aggregates.

Rocks silicified by either of these metasomatic processes or by a combination of both may occur, but are, as far as my experience goes, not often encountered as wall rocks of auriferous quartz veins.

But neither of the processes can have produced the massive white coarse-grained quartz of certain gold veins such as those of the California gold belt. This quartz, which contains native gold and sulphides, shows under the microscope a peculiar coarsely granular structure, the grains being partly bordered by crystallographic surfaces. This structure could only have been developed by free crystallization in open spaces. It is scarcely necessary to call attention, in addition, to the frequency of comb-structure, etc., proving also the same kind of origin. This does not necessarily mean that all large bodies of quartz have been deposited in an open space as large as the volume of quartz now is; repeated openings of the fissure have doubtless often taken place.

In nature, the complication of the fissure veins is often great and it is clear in fact that it must be so, for the walls are often shattered, resulting in an alteration of the country rock and deposition of a net of quartz in the interstices; ground-up mud often fills the fissure, and the result of the action of the solutions on this will be a mass of grains of altered rock cemented as in a sandstone by quartz.

Structure of the Veins.—The existence of fissure veins is primarily due to one or more fault planes, fissures or seams, forming ducts for the ore-bearing solutions. The ore proper, which is constituted of various sulphides with a gangue of more or less quartz, calcite, etc., occurs chiefly along these separating planes and on seams connected with them. The typical fissure vein may be regarded as a single break along which, through faulting, more or less continuous open spaces were formed and subsequently filled with ore. On both sides of this filling there is a gradually fading zone, in which more or less extensive alteration of the country rock has taken place.

In many regions the typical simple fissure vein is relatively rare. The country rock may be cut by one or several fault planes, along which only small open spaces have formed, and around which there is a wide belt in which the country rock has been altered. The ore then mainly accumulates along these planes, largely by filling, partly also by metasomatism of the immediately adjoining rock. The two classes of ore, as a rule, have special characteristics, and may be distinguished one from another. Again there may be a shattered zone adjoining one or more fault planes; the rock is then traversed by a complicated system of seams and large areas of the adjoining country rock may be altered. In this case again the seams generally contain the gold, and the whole seamed rock mass may form a large ore-body of low grade.

Acetylene in the Laboratory.—The most recent proposal in connection with the use of acetylene in laboratories is that made by H. G. Söderbaum, in the current number of the *Berichte*. It appears that the gas can be employed for the quantitative precipitation of copper in ammoniacal solution, and for its separation from metals like zinc, which are not precipitated by ammonia. Acetylene possesses the great advantage over sulphuretted hydrogen, which is usually employed for this purpose, that it yields a precipitate which can be filtered and washed very rapidly, and which does not easily become oxidized and pass into solution. The washed precipitate is finally decomposed by dilute nitric acid, the solution filtered and evaporated to dryness, and the residue ignited and weighed as oxide.

Effects of Intense Cold.—At the Royal Institution in London, recently, Professor Dewar began the last of his course of lectures on "Liquid Air as an Agent of Research," with a short discussion of the limiting volume of substances at the zero of absolute temperature. It was impossible, he said, to believe that matter at that temperature would have no mass, and the extension by extrapolation of the curves expressing variations of density at attainable temperatures might give entirely wrong results, because at low temperatures many properties of bodies dropped, as it were, over a precipice. The lecturer then illustrated by experiments the changes produced in the elastic constants of various substances by intense cold, and proceeded to discuss chemical action at low temperatures. All ordinary reactions entirely ceased, largely because everything became solid—a state of matter not favorable to chemical action. Photographic action, however, persisted to a certain extent, particularly if gelatine plates were used. This might probably be explained as indirectly due to the property possessed by organic bodies, especially the more complex ones, of phosphorescing at low temperatures. Professor Dewar also showed how cold increased the magnetic moment of a permanent magnet by as much as 20 or 30%, and at the same time illustrated the magnetic properties of liquid air itself. In conclusion, he referred to the effects of extreme cold upon living organisms. In the case of ordinary putrescent matter it was found that the spores were not killed by being subjected to the temperature of liquid air, and experiments were now being carried out to discover whether seeds exposed to liquid air for at least 100 hours still retained the power of germination.

SOME ALABAMA COAL MINES.

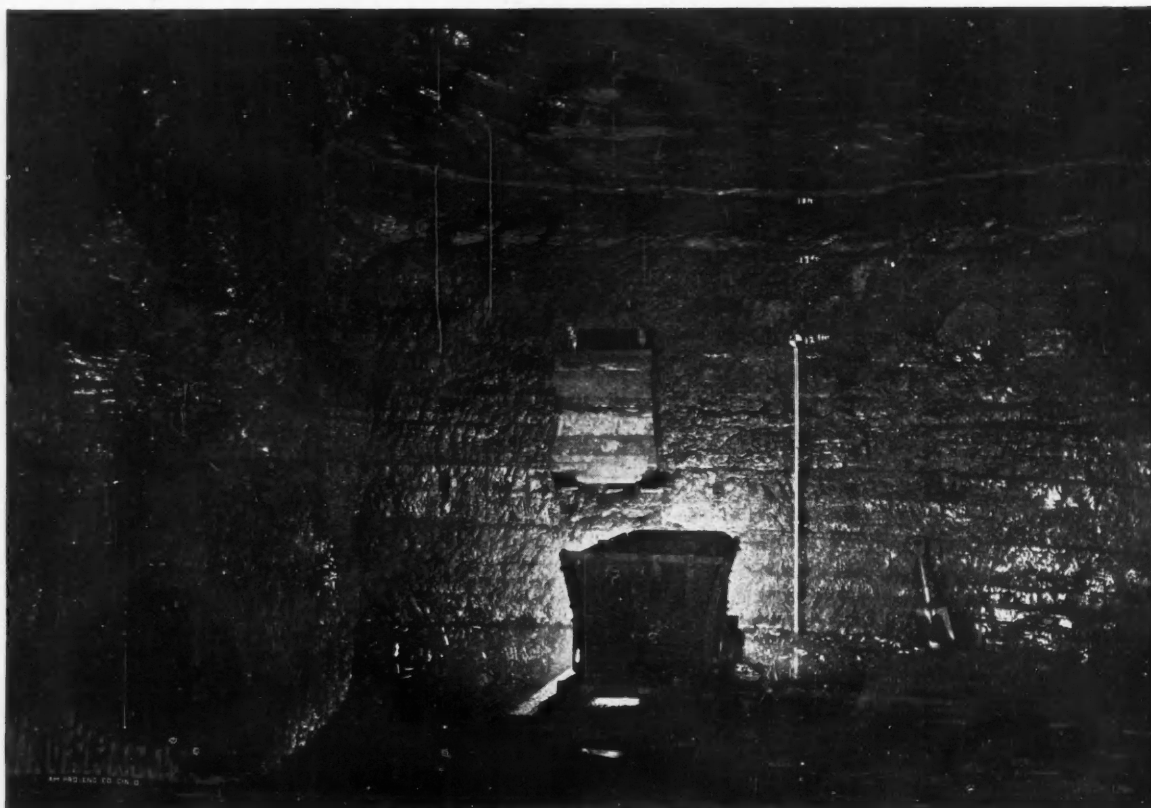
The accompanying illustration, from a historical pamphlet recently issued by the Tennessee Coal, Iron and Railway Company, is from a photograph taken in the Johns coal mine, showing the thickness of the seam. The Johns mine is situated in the Little Blue Creek basin of the Warrior coal-fields on the Birmingham Mineral branch of the Louisville & Nashville Railroad. The slope is about 3,000 ft. long, the basin being reached at 1,500 ft. The output is about 800 tons per day and the coal is treated in a double Robinson coal-washer, located at the mine, before it is coked in the ovens near by.

The Tennessee Company has been for some time cultivating an export trade in coal, as well as in pig iron, the chief port used being Pensacola, where large shipping docks have been built. While these docks are controlled by the Louisville & Nashville Railroad Company, the coal exported from there has so far all been furnished by the Tennessee Coal, Iron and Railroad Company. This export trade is chiefly with Mexico, and about 100,000 tons per year have been exported for supplying railroads in that country. Besides this Mexican trade the company has also shipped occasional cargoes to Central American points. The company

THE BLUE MOUNTAINS IN UTAH.

The Blue Mountain Range is located about the center of San Juan County, in Southeastern Utah, has an area of about 10 by 25 miles in extent, and reaches a total height of 11,400 ft. above sea level. The mesas at the base of the mountains range in the neighborhood of 7,000 ft. above sea level.

The southern end of these mountains, where gold, silver and copper are found, contains the two highest hills in the entire range, with two somewhat lower hills coursing parallel between them. These principal peaks are Abaja, on the east, and Mount Linneas, on the west, both about the same height, while the ridges separating these two prominences are from 1,000 to 1,500 ft. lower in altitude. This entire range seems to have about the same pitch, 32°, from crest to base, and in most places along the top of the main ridges the apex comes to a wedge-shaped point, not wide enough for a foot-path unless it be made so by means of tools. These mountains are covered by a heavy drift of broken rock, consisting of quartzite, conglomerate, breccia, porphyry and limestones of both the dolomite and carbonate varieties.



VIEW IN JOHNS COAL MINE, ALABAMA.

owns in all 28 coal mines, having a daily capacity of 16,900 tons, or 5,070,000 tons yearly; and 3,256 coke ovens, which can turn out 5,230 tons daily, or 1,569,000 tons of coke per year. From a summary of the acreage owned by the company, it is learned that total for Alabama is 240,807 acres, and for Tennessee 111,741 acres; making a grand total for the two States of 352,548 acres.

Coal in Mexico.—Tests were recently made on the Mexican Central Railroad of coal from a deposit opened at Jiquilipan in the State of Jalisco. They are said to have shown the coal to be the best yet discovered in Mexico. A branch line will probably be built to the mines.

The Fischer-Oppermann Amalgamating Process.—The claim of this process according to the English patent (17,020 of 1895) is for the treatment of ground ores with jets of mercury vapor mixed with steam for the purposes of extracting the precious metal by amalgamation. It is carefully stated that they do not claim mercury vapor alone, but only when mixed with steam. The patent for the plant used in the process is not yet published, but the following is an account of the plant at the works. It consists of a framework of tubes arranged parallel to each other at a short distance apart and opening into a large tube placed at right angles. The tubes are placed across the top end of the copper plate just under the mortar box, at right angles to the flow of the pulp as it comes through the screen, and they are so placed that the pulp runs immediately under them without touching them. The under sides of the tubes are perforated at short intervals. Mercury is vaporized in an ordinary retort and the vapor passes down a pipe to a steam injector where it is mixed with steam and forced through the set of pipes, coming out in small jets through the perforations and impinging on the pulp. In this way some of the gold is amalgamated at once; this and the remaining gold pass over the rest of the copper plates, where, and in the wells, the amalgam and mercury are caught. [There is nothing new in the use of vaporized mercury and nothing desirable in practice, for it has been tried again and again in the last 20 years and abandoned in most cases on account of the increased complexity of the plant and because it generally results in salivation of the men.—Ed. E. & M. J.]

Native gold, in the form of both coarse flakes and wires, has been found here; native silver and sulphurets have also been encountered in the same locality, principally in the porphyritic formation, while bunches of iron-stained sandstone have yielded high returns, and the slates of this region also carry gold in variable quantities. The deepest working in this district consists of one shaft having a vertical depth of 54 ft., which connects with a tunnel 200 ft. long, running through the crest of the hill, exposing a slip on the slate formation from quite a large contact vein of gold-bearing ore (principally decomposed porphyry), yielding from \$1.50 up in value per ton. The ores of this region thus far discovered (no veins really in place having yet been opened up) are partly free milling or stamping, and partly concentrating, as all of them contain more or less white iron, and the latter in some instances carries appreciable quantities of gold.

These hills, while steep and thickly covered with slide rock, are well timbered, showing immense pines, Aspen and Pinon. This region is drained by two branches of the Johnson Creek, Recapture and North or Montezuma creeks, which, aided by springs, are able to supply all of the water necessary for milling operations. A coal-bed has been opened in two places at the eastern base of the range, which shows about 2 ft. in thickness of good lignite, suitable for steam generating and smithing purposes. Along the water courses of the south end of the range not a single water-worn pebble or boulder is encountered, and the assessment holes, about 100 in number, all sunk in the drift, showed no rocks bearing evidence of water wearing.

The body of coal on the east side of the base of these hills, having the same pitch as the mountains proper, coupled with the absence of the action of local chemical or water inundation, and the inability to find the older geological rocks here, on the flat lands or in the dry washes of the surrounding deserts, shows plainly that these prominences are of recent origin when compared with the age of the Rockies. Some gold as coarse as grains of wheat has been washed from Johnson Creek sands, and quite a liberal quantity of black sand (magnetite) is met with in all panning operations, carried on with macerated float. In this region, located near the south end of the range, where the prospecting seems to have been carried on most extensively, one can get gold colors from various rocks and from much of the soil, and the presence of minute particles of

magnetic oxide of iron, carrying gold, disseminated all over the region, in great quantity, only goes to back up the statement that this gold came from near by.

Much of the original sedimentary formation has been thrown off and drifted away from these hills since their formation, and the box canyons surrounding this range show that severe earthquakes and perhaps frequent recurrences of them have buried the veins under many feet of debris, but the float found on the surface at intervals is a sure enough indication that with workings reaching into solid formation, fissure or contact veins cannot fail to be encountered.

This region is now well supplied with wagon road facilities, extending from the desert up to the extreme top of the range, with a fair average grade, which enables one to reach almost any point desired by means of wheeled vehicles, and good, safe trails lead off from these roads to all streams and leading mountain points. The summers here are pleasant and the winters are usually mild and with but little snow, as the mountains are not high and the sun soon melts the fallen snows. The only town at present is the Mormon settlement of Monticello, whose people are principally engaged in farming.

THE CARTERSVILLE MINING DISTRICT, GEORGIA.

Written for the Engineering and Mining Journal by William M. Brewer.

Bartow County, of which Cartersville is the county seat, occupies a peculiarly advantageous position with regard to mineral resources. The mining district, which takes its name from the town, embraces large areas of mineral-bearing land situated in both the paleozoic and crystalline areas. The line of contact between the Cambrian shales and Knox dolomite of the paleozoic, and the semi-crystalline slates of the crystalline occurs about eight miles southeast from the town itself, and in this vicinity has a more northerly trend than is usually found at other points along this line of contact. In consequence of the geological location of this district, the mineral resources are more diversified than probably at any other one point in the Southern States. The list of minerals having economic value, and which have been more or less developed in this district, includes: Brown iron ore (limonite), manganese, gold, baryta, graphite and ocher.

It is not generally known that in this district some work had been performed several years back in placer mining. Most of this was in a formation which is similar to the Hillabee schists (altered eruptive) which are so persistent and occupy such a prominent position among the metamorphic rocks in Alabama. The country rock in which the ore body of the Royal Gold mine is inclosed is very similar to that near Allatoona, where extensive placer mining operations were carried on, and the geological position of this country rock corresponds exactly with that in which the Hillabee schists occur in Alabama, immediately southeast of the semi-crystalline, Talladega or Ocoee slate, which in its turn forms the northwest boundary of the crystalline area of Georgia and Alabama. This district has not received much attention, so far as gold mining is concerned, for several years past, until quite recently, when an English syndicate purchased and paid for 600 acres of land locally known as the Glades gold mine. No work has yet been commenced to develop the property, or to ascertain, by reopening the old workings, what its actual value is, but I am informed that an engineer is to leave England at once to take the general superintendence of the mine. The old workings on this property consist of five or six shafts, the deepest being 120 ft., but none of these are accessible for examination.

Adjoining the Glades property on the west occurs the Allatoona mine property, which was also operated some years ago by a Boston syndicate. It is on these two properties that the evidence of such extensive work in placer mines occurs. There are several bodies of quartz in the district which carry gold, but on which only very shallow work has been done, and consequently it is impossible to determine the value of such properties. There also occur in this district some apparently extensive bodies of gold-bearing quartz and semi-crystalline slates interstratified. Samples taken from crosscutting on one of these ore-bodies at a shallow depth by the Georgia Geological Survey yielded \$7.50 per ton in gold. The deepest work on this property is an inclined shaft 30 ft. in depth which has been sunk since the sample was taken by the State Geologist from the open cut. A cross-cut tunnel 70 ft. in length has also been run on the same ore-body but on adjacent property; the material through this tunnel showed some value by panning, but whether the yield would be sufficient to warrant milling operations is yet an open question. The structure of this ore-body is that of innumerable narrow lenses of quartz imbedded between strata of semi-crystalline slate, which yields a considerable proportion of iron garnets. The fact of the apparently great extent of this material, even though it is of very low grade, would warrant mining and milling operations because of its free-milling character and the extremely low cost at which it could be mined. There are other similar bodies to the southwest of this, and situated at quite a distance from it, but in the same district, which were gold-bearing and on which the conditions with regard to the ore-bodies were very similar.

The Cartersville District is adjacent to and northeast of what may be termed the Cherokee County mining district, and may be said to extend from the western boundary of that district in a southwesterly direction to Burnt Hickory Ridge, in Paulding County. The Etowah River and its tributaries which flow near the contact of the paleozoic and crystalline formations furnishes ample water supply for mining and milling purposes, also for the washing of manganese and brown iron ore. The Etowah furnishes also, within a short distance of the town of Cartersville, quite extensive water powers, some of which were improved some years ago. In fact, one of the most important industries in the State was organized here by Major Cooper in the early fifties. This included a flouring mill of large capacity, stone-stack iron furnace, machine shops and forges. This property was confiscated during the war by the federal government, and afterward purchased by the Etowah Iron Company. This management abandoned the old plants and erected a very complete washer with jigs, automatic elevators, etc., for the purpose of shipping manganese ore. It also built and equipped six miles of railroad

for hauling ore from the mines to the washer. After this investment the company went into the hands of a receiver, and all operations were stopped.

The Peruvian Ocher Company at Emerson, six miles southwest from Cartersville, has been successfully operating for some years both in manganese and ocher. The deposit of ocher is situated close to the Etowah River, south of Cartersville, and covers a superficial area of about five acres. The extent of this deposit has been determined by the running of a tunnel 185 ft. in length and an upraise from the heading 130 ft. through crude ocher. The company mines the product for a royalty on the tonnage of prepared ocher, which will represent about 50% of the crude material obtained.

The Cartersville District is one of the very few in the United States from which manganese ore has been shipped. During the past few years this district has furnished more than 1,000 tons annually of this ore, which is shipped to the Carnegie Works in Pennsylvania and various chemical works throughout the Eastern States. Since 1893 the Cartersville District has furnished all the manganese shipped from the State of Georgia, but prior to that time the Cave Springs District was also a producer.

ELECTRIC LIGHTING OF A QUARRY.

An interesting electrical installation has recently been made in the quarries and mills of the F. O. Norton Cement Company, at Binnewater, N. Y., in the Rosendale cement district, about seven miles from Kingston. This company manufactures natural cement as distinguished from the Portland. The deposit from which the Norton (natural) cement is made is bluish grey magnesian limestone or cement rock found in strata of between 14 and 17 ft. in thickness, constituting the hills along the valley of the Rondout Creek.

The power plant consists of four horizontal steel tubular boilers, 16 ft. x 17 ft., furnishing steam at 100 lbs. pressure to a 750-H. P. Harris-Corliss cross-compound slow speed engine. This power is used to operate 16 cracker mills, the crushers, etc., etc. In all 20 kilns of the dimensions mentioned above are now in service.

The electric plant consists of a 30-k. w. alternating current incandescent dynamo, manufactured by the General Electric Company, as in fact are the lamps and wiring devices of which the plant consists. This machine is driven by a 10 x 12-in. horizontal automatic Ball engine. There are now installed 103 incandescent lights, lighting the kiln shed where the calcined product is taken to the crushers, the mills, the packing-rooms, the shipping-rooms and various other departments of the factory. The quarries are lighted by 40 incandescent lamps and 14 arc lamps. The current is used at a pressure of 300 volts, being reduced by transformers to the necessary voltage for arc and incandescent lamps. Each arc lamp is operated by its individual transformer. In addition, one or two incandescent lamps on flexible cords, protected by wire cages, will be operated from the same transformer where particularly close light is required. Arc lamps are also connected by flexible cord to the transformers which are placed back of the nearest pillar to the face of the gallery. The lamps are supported from the roof of the gallery by means of rope and pulley, and give a most satisfactory general illumination for the whole work. The men have suspended a light for handling the drills and shoveling the broken stone in the loaded cars, etc., etc. Incandescent lights fixed in position are placed at the main platforms, turn-table, etc., while lamps for the purpose of general illumination are also placed at moderate intervals along the galleries now being operated. When the blasts are fired, the lamps are unhooked and taken back behind the pillars.

This installation has entirely done away with oil lamps, the use of which in many cases rendered work almost impossible, as very often the room was so filled with smoke and fumes that the men could only work there for a short time; in fact the whole mine was rendered murky and disagreeable to work in by the odor from the lamps.

The circuits are carried into the quarries from the power-house, a distance of about 400 ft. in one direction and 1,500 ft. in the other. They are carried along the galleries fastened to insulators fixed to plugs driven into holes in the roof of the worked out galleries. From various points main loops are carried to the galleries where the work is going on.

Iron Production in Belgium.—The output of the Belgian blast furnaces in April was 92,850 metric tons. For the four months ending April 30th the total was 362,445 tons, showing an increase of 93,925 tons, or 34.8%, over the corresponding period of 1896.

Coal in the Asturias, Spain.—Consul Talbot, of Corunna, reports to the British Foreign Office that coal is one of the most important products of the province of Asturias, and there is no doubt this province with its mineral resources is engaging the attention of enterprising foreigners. French capitalists hold that if the ruinous competition among the various coal owners were to be brought to a conclusion profits could easily be doubled, and it would be possible to compete with English coal, both for home and foreign markets; they are therefore assisting a project for the fusion of all the mining companies in Asturias. For some time past the profits on coal have been from 2 to 3 pesetas per ton, and the average cost of production 7 to 8 pesetas, in companies using modern appliances. Many very important economies could be effected, and one of the most necessary of these is no doubt the increase of railway facilities. Mr. Vice-Consul Penlington, of Gijon, adds that the seams are not very regular, having 35% of faultings, and have an average dip of 33°. As the country is mountainous, with deep interlying valleys, and the seams crop at their summits, and along their sides, all work to the present has been by levels, one above the other, with slopes of 15 to 20 m. between these. Rises are put through these backs, from level to level, to secure ventilation, and the coal as it is stoped is shot through them to the trams placed in the galleries below. The workable seams are from 1 ft. 4 in. to 5 ft. 7 in. thick.

PERSONAL.

MR. GEORGE D. B. TURNER, engineer of the Wakefield mine at Silverton, B. C., recently returned from England.

MR. JOHN T. MITCHELL, mining engineer, of Denver, Colo., has been examining some tellurium mines on Little Dry Creek, near Mogollon, N. Mex.

STATE SENATOR BAUM, of Washington, has been on an extended trip to the Okanogan district of British Columbia, where he has large mining interests.

MR. WM. CHURCH, of Denver, Colo., until recently president of the Detroit Copper Company, at Morenci, Ariz., is on a tour of inspection of the territory.

MR. ERNEST KENNEDY, of Rossland, B. C., is about to leave for England via New York. Mr. Kennedy is on a business trip and will be absent several weeks.

MR. WILLIAM M. BREWER, the Southern correspondent of the *Engineering and Mining Journal*, has removed his headquarters from Atlanta, Ga., to Birmingham, Ala.

MR. ARTHUR McCLOSKEY, who has been identified with the Pinto Mining Company's property in Iron County, Utah, has gone to Park City to begin work on the Grindstone quarry.

MR. C. S. WETHERELL, mining engineer, of New York, is making an extended tour through western mining districts. He recently reached Salt Lake City from Leadville, Colo.

MR. JOHN W. YOUNG is again at Salt Lake, after an absence of three months in the Atlantic cities and a tour through several mining regions, including quite a scope of British Columbia.

MR. WILLIAM FARRELL, who had charge of a wire plant at St. Louis, Mo., belonging to the Pittsburg Wire Company, has been made general manager of the same company's plant at Braddock, Pa.

MR. A. BURCH of Salt Lake City, Utah, has accepted the position of superintendent of the Bunker Hill & Sullivan mine at Wardner, Idaho, made vacant by the resignation of Mr. J. E. BRANSCOMBE.

MR. FRANK GILPIN, an experienced Colorado mining man, has been appointed general manager and superintendent of the Lillie Gold Mining Company's property in the Cripple Creek District, Colo.

MR. PERCY L. FEARN, of Olcott, Fearn & Peele, mining engineers of New York, was in Chicago last week. Mr. Fearn is on his way to the West, where he will examine and report on some gold properties.

MR. GILL S. PEYTON, who played a leading pioneer part in the development of Camp Floyd's present gold era, has interested New York and Boston capital near his first success. He returned to Utah 10 days ago.

MR. W. DE L. BENEDICT, mining engineer, is now on a professional trip through Utah, Montana and British Columbia. His permanent address is the Bank of Commerce Building, No. 31 Nassau street, New York City.

MR. W. L. SIMS, secretary and treasurer of the Sloss Iron and Steel Company, of Birmingham, Ala., has resigned. He was connected with this company for 10 years, and acted as one of its officials for the last eight years.

MR. JAMES B. MILLER, who represents the American Exploration Company, of London, was recently in Butte, Mont., to inspect the Six o'Clock mine, now under lease and bond to representatives of that company.

MR. D. V. COLEMAN, who has been in charge as mill superintendent of the Golden Giant Mining Company, near Silver City, N. Mex., for several months past, has gone to Dos Cabezas, Ariz., to take charge of a gold mill at that place.

MESSRS. HORACE SEE and W. H. JAUQUES, who have been associated as consulting engineers, have dissolved partnership by mutual consent. The offices at No. 1 Broadway, New York, will be retained by MR. HORACE SEE, consulting engineer.

MR. GEORGE W. MAYNARD, of New York, is in Piute County, Utah, examining the Gold Mountain district. He is in the company of Mr. J. G. LOGAN, who some months since recommended the purchase of the Surprise mine there to a syndicate now testing its worth.

MR. BERNARD VAN VORSTENBERG, who has been for over two years past engaged in the work of preparing statistics for *The Mineral Industry*, sailed from New York on May 29th. He intends to spend several months in Europe and then expects to return to New York.

MR. C. J. NORWOOD, whose term as mine inspector in Kentucky expired April 1st, has secured a position with a gold-mining company at Dalonega, Ga. He is one of the best-known geologists and mining experts in Kentucky, having served the State as a geologist or mine inspector for about 15 years.

MR. ROBERT H. SAYRE, Sr., for many years general manager of the Bethlehem Iron Company, resigned his position May 31st. He is also Third Vice-

President of the Lehigh Valley Railroad. He has been active in the interest of both the iron company and the Lehigh Valley Railroad for a long time.

MR. GYWNE DENNIS, at the head of a big syndicate operating gold properties at Idaho Springs, Colo., has left for the copper mines on the Colorado River in Arizona, lying 100 miles north of Williams. His company intends opening up a group of properties in that section, and Mr. Dennis will give the preliminary work his personal attention.

MR. W. A. CARLYLE, Provincial Mineralogist of British Columbia, has left Victoria on his annual visit to the mines of the province. His trip will last five months, during which time he will visit Yale, Vernon, Kettle River, Boundary Creek, Lardeau, Trout Lake, Illicillewaet, Kamloops and Cariboo, a very great extent of territory.

MR. W. H. WILEY, of Idaho Springs, Colo., who recently returned from an examination of the gold-fields of Corea for a New York and London company, has just completed an examination of the new districts of Wyoming, lying thirty miles north of Laramie and has departed for Nevada, where he is to examine mines lying 75 miles to the south of Elko. He will be absent from Idaho Springs until the middle of June. His work in connection with the big mines and tunnels at the latter place is being looked after by MR. A. J. VENTRESS.

OBITUARY.

CARADOC S. REES, a member of the Anglo-American Club at Freiberg, Saxony, recently departed this life. His club members passed the following resolutions:

"WHEREAS, It has pleased God, in His unquestionable wisdom, to remove from the world our beloved friend and former club member, Caradoc S. Rees; and

"WHEREAS, The death of Caradoc S. Rees is a sad affliction to his family and friends, be it

"Resolved, That we tender our heartfelt sympathy to his bereaved family in the loss of their loved one, and be it

"Resolved, That these resolutions be spread on the minutes of the Club, and that a copy of the same be sent to the family of the deceased and a copy sent to the *Engineering and Mining Journal* for publication."

SOCIETIES AND TECHNICAL SCHOOLS.

ENGINEERS' CLUB OF PHILADELPHIA, PA.—A business meeting will be held at 1122 Girard street on June 5th. Papers will be read by Mr. J. S. Robeson, on "The Bertrand-Thiel Modification of the Open-Hearth Process," and by Mr. John E. Codman, on "Rainfall and Stream-Flow Observations in Eastern Pennsylvania."

AMERICAN INSTITUTE OF MINING ENGINEERS.—The next meeting of the institute will be held in the Lake Superior region, with an excursion to the Black Hills, S. Dak. The steamer *North West*, leaving Buffalo July 9th, Cleveland and Detroit July 10th, will stop at Houghton. It will carry a special party under charge of Dr. David T. Day, United States Geological Survey, Washington, D. C. July 12th will be spent at Houghton, Hancock, Lake Linden and other points in the copper country. Leave Houghton July 13th (night) for Duluth, where the following day is to be spent, with excursions to the Vermilion and Mesabi iron ranges on July 15th and 16th. Those so desiring, go to the Black Hills, S. Dak., on July 17th.

OHIO INSTITUTE OF MINING ENGINEERS.—Arrangements are being made for the summer excursion that is to leave Columbus on June 18th for Sandusky. Here the methods employed in loading vessels by the Columbus, Sandusky & Hocking and Baltimore & Ohio Railroads will be inspected. Kelley's Island may be examined for evidences of the great glacier which at one time covered this land. On Wednesday morning the party will be taken by special boat to Huron, where the methods employed for loading vessels by the Wheeling & Lake Erie Railroad will be inspected. They will then proceed to Lorain, where they will lunch as guests of the Johnson Steel Company. The greater part of the afternoon will be spent in examining this mammoth plant. Later in the day the party will inspect the docks and the facilities for loading vessels in the harbor at this point, after which they will go to Cleveland. Thursday will be devoted to the inspection of the various appliances for both loading and unloading vessels at Cleveland, among which are some of the most modern yet designed.

INTERNATIONAL GEOLOGICAL CONGRESS.—The elections of delegates of the highest rank throughout the United States to the International Geological Congress at St. Petersburg, August 14th, invited by the Czar, have resulted as follows: New York Academy of Sciences, Professor J. J. Stevenson, of the University of New York and president of the academy. Davenport (Iowa) Academy of Natural Sciences, William H. Ballou, of New York, also honorary commissioner. Philadelphia Academy of Sciences, Dr. Persifer Frazer, also delegate of the American Philosophical Society and the *American Geologist*. American Association for the Advancement of Science, Prof. James Hall, State Geologist,

Albany, N. Y.; Prof. B. K. Emerson, Amherst College; Prof. C. D. Walcott, Director United States Geological Survey, and Prof. William N. Rice, Middletown College. Geological Society of America, Prof. J. J. Stevenson, New York; Prof. I. C. White, Horgantown, W. Va. Miscellaneous delegates, Prof. D. S. Williams, Yale College; Prof. C. H. Hitchcock, Dartmouth College; Prof. Eugene A. Smith, University of Alabama and State Geologist, and Prof. N. H. Winchell, University of Minnesota and State Geologist.

INDUSTRIAL NOTES.

The Basic Chilled Roll and Iron Works at Basic City, Va., have been leased by J. S. Runciman, who will operate the plant.

The Lehigh Valley Coal and Coke Company is making preparations to start at full capacity its coking oven plant at Superior, Wis.

The Bethlehem (Pa.) Iron Company, on May 26th, shipped 70 tons of armor plate and gun material to the United States Navy Yard at Newport News.

The Facer Solid Steel Car Wheel Company has turned out at its works at Perth, Ont., a car wheel made from a solid steel ingot by a process invented by James A. Facer.

The Bessie Furnace Company has been incorporated in Chicago with a capital stock of \$15,000 to deal in iron and steel. The incorporators are L. Lowry, Bernard L. Lee and Clyde D. Lee.

The Bass Foundry and Machine Company, of Ft. Wayne, Ind., has the contract to furnish the engines for the new bar mill which is to be erected by the Shenango Valley Steel Company at New Castle, Pa.

The Sharon Iron Works, Archman Steel Casting Company's Works, Buhl Steel Mill and other smaller plants at Sharon, Pa., have notified their employees of reductions of 10% in wages. About 1,000 men are affected.

The Chester (Pa.) Pipe and Tube Mill, which has been closed down for the past three months, will start up on June 7th, having a contract for 300 miles of pipe, which will require nine months to complete.

The Andrews Bros. Company, at the mills in Hazleton, O., posted notices on May 27th that taking effect May 30th the wages of all employees not governed by the amalgamated scale would be reduced 10%.

The New Birmingham Iron and Land Company's plant at Rush, Tex., has been bought by R. L. Coleman, and there is a prospect of an early opening of the iron furnace and pipe foundry in New Birmingham, Tex.

The Lookout Iron Company's works at Harriman, Tenn., were recently purchased by W. B. Crinkley at court sale. It is reported that he will remodel the plant preparatory to resumption of operations in the near future.

The Brady's Bend Iron Company's entire property, situated in Armstrong, Clarion and Butler counties, Pa., was exposed to sale on June 5th. The property comprises over 6,000 acres of land, nearly all of which is rich in mineral deposits.

The Reading Iron Works' employees at Danville, Pa., have declined to accept a reduction of wages offered, and the plant has shut down. The reduction proposed affected only the tonnage men and amounted to 5%. The day men were not affected.

The Carnegie Steel Company, Limited, Pittsburg, will very soon finish up all the armor plate work it has on hand, and unless additional orders are received in the meantime the armor plate department at the Homestead Steel Works will be closed down.

The East Lebanon Iron Company's 10-inch rolling mill at Lebanon, Pa., was destroyed by a fire of unknown origin on May 30th. The loss is \$20,000, covered by insurance. Four years ago the company's entire plant was destroyed by a wind storm, and two months after it was rebuilt, it was again destroyed by a fire.

The plant of the Akron Iron and Steel Company, at Akron, O., it is reported, is soon to be closed. Already a large part of the shop and office forces have been suspended, and the mill is now operated only in the shafting department. Efforts to reorganize the company and to sell the plant are said to have been unsuccessful.

The Hollidaysburg (Pa.) Iron & Nail Works closed negotiations May 29th for the purchase of the Midvale Rolling Mill & Railroad Spike Works, a completely equipped plant, located at Roanoke, Va. It is as yet undecided whether to remove the plant to Hollidaysburg or to Birmingham, Ala. The Hollidaysburg Company is making preparations to add a steel department to its works.

The Pennsylvania Steel Company has put its No. 2 furnace at Steelton, Pa., into blast. This furnace, which has been idle considerably more than a year, has been enlarged in its tuyeres, a new lining added and alteration made to its top and pipes, as well as a general overhauling of machinery. The furnace is

the largest at Steelton and has a capacity of over 200 tons per day.

The Baltimore Iron, Steel and Tin Plate Company's plant at Locust Point, Md., has been sold for \$50,000 to William H. Harris and David Tamplin, of Ohio. The company went into the hands of the receivers, Rufus W. Applegarth and John S. Gibbs, on January 19th, 1897. Since then they have been trying to sell the property at private sale, with the permission of the court, which still retains jurisdiction.

The Consolidated Steel and Wire Company is installing two large engines in its plant at Rankin, Pa. They were built by the St. Louis Iron and Machine Works, of St. Louis, Mo., and required 76 cars to transport them, the entire weight being 300 tons. One of the engines is of the cross-compound condensing rolling mill Corliss type of 2,200-H. P. capacity and the other tandem compound type of 1,800-H. P. capacity.

The Central Underground Railway of London is to be equipped with electric motive power, the apparatus for which will be manufactured in the United States. A contract has been signed in London with the Underground road by E. W. Rice, Jr., the representative of the General Electric Company, of New York City and Schenectady, N. Y. The amount of the first installation of the power under the contract is about \$700,000.

The Ohio Iron and Steel Company, of Lowellville, O., has begun the manufacture of basic iron cast in chills, free from sand, with minimum of silicon and sulphur, standard Bessemer in chills or sand or iron of any special analysis or grade. The manufacture of this iron will in no way interfere with the manufacture of the company's Mary Ohio Scotch foundry iron, well known to the trade for many years, and which has been its specialty for a long time.

The America-Russian Mining and Metallurgical Company, of Marioupol, Russia, is negotiating with the Delaware Iron Company for the erection of a new pipe mill, and New Castle mechanics will probably be sent abroad to build it. The Russian concern, which recently had a pipe mill erected, is producing pipe from 5 in. to 8 in. in diameter, and desires to produce pipe from 3/8 in. to 2 in. in diameter. In order to produce the latter it will obtain new machinery.

The Du Bois Iron Works' new plant to be erected at Du Bois, Pa., will consist of a foundry, 80 x 100 ft.; boiler shop, 80 x 100 ft., and machine shop, 80 x 260 ft. The buildings will be of steel and brick and the roof of slate. Three traveling cranes and several small jib cranes, controlled by compressed air, will be installed. The new firm will manufacture mining machinery and a water-tube boiler of new construction. The works are under the superintendence of J. H. McEwen, who was formerly president of the J. H. McEwen Company, Ridgway, Pa.

Charles E. W. P. and H. B. Stephens, lien creditors of the Watson Mining and Manufacturing Company, have filed exceptions to the sale of the company's property by the Union Trust Company, which was appointed receiver for the corporation. They claim the property was sold at a price less than half its value. Objections are also taken to the manner in which the property was advertised for sale and to the descriptions of the property given in the advertisement. It is also claimed that the terms of sale were not in accordance with the decree of the court. The property was appraised at \$112,000.

Reading Iron Company employees at Reading, Pa., to the number of 600 stopped work on June 1st, because of a reduction in wages. The sheet mill, puddle mill and Cley street mill are involved. The puddlers say their reduction is from \$2.70 to \$2.40 per ton, and that they will earn only about \$1.70 a day according to the new arrangement. The laborers, rail hands, heaters and helpers were given a cut of about 10%, which will bring common labor down to 90c a day. The company employs over 2,100 men in Reading and about 700 hands in Danville. It is thought that if the strike continues all these 2,800 will be affected.

The Queen Construction Company is erecting in Flushing, Long Island, N. Y., a new electric light plant. The building is divided into two portions, a boiler-house 40 ft. x 42 ft., and an engine and dynamo room 43 ft. x 71 ft. The walls are of brick and have substantial stone foundations, and the roof is of iron covered with metal covering. The building, when completed, will be absolutely fire-proof. The roof of the engine and dynamo room is lined with the Berlin Iron Bridge Company's patent anti-condensation roof lining, which prevents condensation of moisture on the underside of the roof, a result which is absolutely necessary to obtain in a building filled with electrical apparatus. The Berlin Iron Bridge Company has the contract for furnishing and erecting the steel framework and the covering.

TRADE CATALOGUES.

The Westinghouse Machine Company, Pittsburg, Pa., manufacturers of the Westinghouse steam engines, has a new catalogue that is a model of neatness. Considerable space is devoted to illustra-

tions, because in making the pictorial feature prominent the company adopts the best form for trade circulars, particularly those relating to machinery. The illustrations which have been selected for this catalogue show a limited number of the company's important installations, from which the user of steam power can gain a good impression of the application and wide range of service of Westinghouse engines.

NEW PATENTS.

UNITED STATES.

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

WEEK ENDING MAY 25TH, 1897.

583,049. FLUID COMPRESSOR. Frederick W. Gordon Philadelphia, Pa. Assignor to The Philadelphia Engineering Works, Limited, same place. The combination, with the compressor-cylinder and discharge-valve, of a device under the direct influence of the piston of the compressor and a differential piston having its major area in fluid communication with the receiving side of the valve, and having its minor area in communication with the discharge side of the valve, and a positive connection between the differential piston and valve to cause the valve to open and be held open.

583,075. COMPRESSION PUMP. William F. Niebling, Cincinnati, Ohio. The combination of a reciprocating piston and a pump cylinder, valve-chests at each end of the latter, an inlet and discharge valve in each valve-chest, inlet-pipes to the valve-chest of each inlet-valve, a passage or side pipe connecting the inlet-pipe to one valve-chest at one end with the inlet-pipe to the valve-chest at the other end, a port connecting the side pipe with cylinder midway between the latter's ends and a valve controlling communication by the port between the side pipe and the cylinder.

583,104. SYSTEM OF GENERATING AND USING HYDROGEN GAS AND ELECTRICITY. Luther H. Wattle, Providence, R. I. Assignor, by direct and mesne assignments, of three-fourths to William R. Sherman, same place, and Byron C. Davis, Brooklyn, N. Y. The combination of an electric-dynamo motor mechanism connected with the electric generating devices of the generator, a gas-engine mechanism connecting with the gas-generating apparatus of the generator and the power-delivery mechanisms of the electric motor and the gas engine being connected to the same power-receiving apparatus.

583,116. ROTARY RETORT FURNACE. John R. Moffit, Omaha, Neb. The combination of a suitable frame, two hollow cylinders set eccentrically and having a chamber between them which is closed to the furnace, the inner cylinder being perforated, and a continuous discharge for the ore from the lower part of the chamber at the opposite end.

583,123. CARBURETER. Bainbridge L. Ryder, San Jose, Cal. A vaporizer consisting of a shell or casing having a well in its bottom, a holding-ring therein, open at both ends, having a diameter sufficiently less than the diameter of the casing to leave a circumferencing space, and having a length shorter than the casing to leave an underlying space, the ring being exteriorly threaded at its upper end and having a screen at the upper end, a mass of absorbent material within the ring, a guard resting upon the bottom of the shell or casing and surrounding the well therein, having its upper end open and provided with a screen and its lower end provided with apertures, a cap for the casing to which the upper end of the ring is screwed, with a pipe leading from the cap, an inlet for air, an inlet for the vaporizable liquid at the lower portion of the shell, a valve controlling the flow of liquid having an inwardly-projecting stem, horizontally disposed and a spring on the stem tending to hold the valve normally closed.

583,201. AIR-PUMP. Charles L. Newcomb, Holyoke, Mass. Assignor to the Deane Steam Pump Company, same place. The combination of an integral base-section, comprising a pump-cylinder in its lower portion and enclosing a discharge-chamber in its upper portion and having a transverse partition spiraling the discharge-chamber and the pump cylinder partition being provided with a tubular boss extending upwardly into the discharge-chamber, and forming ways for a pump rod.

583,240. APPARATUS FOR MIXING COMPRESSED AIR AND STEAM IN ANY PROPORTIONS. Alexandre E. Thomine Paris, France. The combination with a reheater, having tubes through which the compressed air passes successively, of a vaporizer through which the air passes after leaving the reheater and before returning to it again, and a mixing-chamber, in which the vapor formed in the vaporizer, and the air after finally leaving the reheater, are mixed.

583,249 and 583,250. ELECTRIC FURNACE AND METHOD OF OPERATING SAME. Alfred H. Cowles, Cleveland, O. Assignor to the Electric Smelting and Aluminum Company of Illinois. The combination of an electric-furnace chamber with gas inlet and outlet flues or passages and a reversing valve connected with the inlet and outlet flues or passages and adapted to change the direction of the flow of gas through the electrically-heated field of the furnace-chamber. The method consists in passing an electric current and generating within the mass of the material electrical heat, and in periodically passing gas therethrough in opposite directions.

583,255. CATHODE FOR ELECTROLYSIS. Ernest Auguste Georges (called Charles) Street, Paris, France. Assignor to the Electro-Metallurgical Company, Limited, London, England. A cathode characterized by a contractibility in dimensions when the deposit has formed thereon, so that the deposit may peel off and be removed with the greatest facility; the cathode being constituted for this purpose by a thin sheet, preferably of metal, wound once or oftener upon itself; and the contraction in the dimensions being obtained after the formation of the deposit.

583,354. AMALGAMATOR. Francis B. Austin, Tempe, Ariz. The combination of a sluiceway, a pan of insulating material arranged within the sluiceway, for containing mercury, metal partitions arranged in the pan, a carbon plate arranged in the bottom of the sluiceway above the pan, and a source of electricity

one pole of which connects with the mercury-pan and the other pole connects with the carbon plate.

583,466. MINING MACHINE. Charles E. Davis, Chicago, Ill. Assignor to the Independent Electric Company, same place. The combination of a continuously revolving motor, a revoluble cam, a bar provided at one end with a roller which bears against the cam, the other end of the bar bearing against an arm carrying a pawl that engages a ratchet-wheel, means for holding the arm and bar in engagement, and two shafts adapted to be alternately connected to the ratchet-wheel and provided with sprocket-wheels that engage a single stationary rack.

583,407. ELECTRIC DRILL. Charles E. Davis, Chicago, Ill. Assignor to Arthur D. Dana, trustee, of same place. A drill comprising a moving part by which power is conveyed to the drill-shaft, the drill-shaft being movable longitudinally with relation to the part and being threaded a portion of its length, a feed-nut engaging the drill shaft and free to rotate therewith, when there is no longitudinal pressure exerted on the drill-shaft, the feed-nut provided with a part adapted to be forced against an opposed surface by the pressure produced by the engagement of the drill with the material upon which it operates, the pressure between the parts holding the nut in position to feed the drill forward.

583,409. MINING MACHINE. Frank N. Slade, Chicago, Ill. Assignor to the Independent Electric Company, same place. The combination of a stationary frame having substantially rigid guides, a cutter-carrying frame supported by such guides and adapted to move therealong, a motor on the cutter-carrying frame, a flexible rack attached at both ends to one frame and a traveling device on the other frame adapted to engage the flexible rack when actuated so as to travel or creep backward and forward along the rack.

583,424. METHOD OF CASTING METALS. Alfred M. Acklin, Pittsburg, Pa. Assignor to Heyl & Patterson, same place. The method consists in pouring the metal into molds partially submerged in water, passing the molds in a horizontal course through the water in the partially-submerged state, and then passing the molds in a horizontal course through the water in a completely-submerged state.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the *Engineering and Mining Journal* of what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufactures in each line.

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GENERAL MINING NEWS.

ALABAMA.

JEFFERSON COUNTY.

TENNESSEE COAL AND IRON COMPANY.—This company has signed a contract with the Semet-Solvay Company, of Syracuse, N. Y., involving the erection at Ensley by the Syracuse Company, at a cost of over \$500,000, of a plant for saving the by-products of coke. The company's sales of iron last week are reported to have been materially larger than for the week preceding.

ALASKA.

ALASKA GARNET COMPANY.—The garnet ledge, near Wrangell, has been located and will be developed by this company; Frank A. Brooks, president; A. G. Bays, secretary. While the garnets found are defective and practically valueless as gems, they are valuable as an abrasive material.

CAT ISLAND.—A rich lode carrying gold, silver and copper has been discovered and located on this island, south of Mary Island. The claim makes the best showing of any in that section and is being worked by parties from Fort Simpson, B. C.

GREEK BOYS' PROPERTY.—This is the group of claims on Johnson Creek, about 1 1/2 miles above the Jualin mine, Berners Bay District, which was recently sold to Mr. D. E. Lutes, representing a Montana capitalist. Mr. Lutes recently returned from Berners Bay and left for Butte and Denver with the intention of purchasing a complete 10-stamp mill. Since acquiring this property a force of 15 men has been kept steadily employed in prosecuting further developments and blocking out ore ready to be delivered to the mill upon its construction. In the No. 2 tunnel, which is driven on the ledge a trifle over 200 ft., there is a shaft sunk 140 ft. in from the mouth. This was already down 29 ft. at the time work was begun and it has been continued to a depth of 60 ft. A crosscut run at the bottom of the shaft from the hanging to the foot-wall discloses a clean-cut vein 16 ft. in width. Thirteen feet of this is solid, high-grade quartz. In sinking 60 ft. the ledge has widened from 6 to 13 ft. Since completing the crosscut at the bottom of the shaft the force of men has been divided, a part having been put to work continuing No. 2 tunnel. Up-rises will be put in every hundred feet, and the ore thus blocked out will be the first to be put through the mill. At the base of the mountain, 160 ft. below No. 2 tunnel, a third opening, which is to be the main working tunnel, has been begun. This will also be driven on the ledge, the ore taken out being stored until the mill is ready to receive it. Up-rises will connect the No. 3 tunnel with No. 2, 100 ft. above. Several mill tests have been made of the ore from this property, each of which has given returns of over \$10 to the ton in free gold saved on the

plates, one running as high as \$29. The concentrates will average 2.2%, and are worth about \$75 per ton.

ARIZONA.

MARICOPA COUNTY.

GOLD BUG.—This mine is developed by a tunnel which runs 110 ft. into the mountain side, striking the ledge at that distance. It is crosscut 100 ft., and is 3 ft. thick. The ore on the surface was free milling, but gets base as depth is attained. This property is in Slim Jim Gulch, 4 miles from King Solomon.

MOHAVE COUNTY.

CEDAR VALLEY MINING COMPANY.—This company is putting new and improved machinery in the mill at Cedar.

PIMA COUNTY.

BLUE JAY.—This mine, 28 miles south of Tucson, is developing some rich bodies of black sulphurets. At the end of the tunnel an incline 60 ft. deep has developed a rich body of sulphurets which, it is said, will go high in silver.

GOLDEN STAR MINING COMPANY.—There are 20 claims in the Guijas owned by this company, all showing good veins of gold ore. There has been about 900 ft. of development work done. It is the purpose of the company to build a mill on the properties this season.

YAVAPAI COUNTY.

DARK HORSE.—Rowe & Gilbert, owners of this mine, have struck 15 in. of silver glance in their lower tunnel, which runs high in silver.

GOLD NOTE & SURPRISE.—D. B. Gillette has bought these mines, near Bumblebee, and proposes to sink 5 double compartment shafts to a depth of 1,000 ft. each. He also intends to put up a mill capable of treating 100 tons of ore per day, to which will be attached a concentrating plant of like capacity. He has 50 men at work now, and the force will be increased soon.

LITTLE JESSIE.—This mine, the property of the Hon. J. S. Jones, now being worked under the superintendency of Hon. A. J. Doran, has uncovered some rich rock in the ore-bearing ledge.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

ALISON.—This mine, 1½ miles west of Plymouth, will start up soon. The shaft is down 100 ft., and a good steam hoisting and pumping plant is on the ground. The vein is from 5 to 7 ft. in width, and mill tests show an average of \$10 per ton.

EL DORADO.—This mine, at Amador City, is being developed by drifts run on the 250-ft. level of the inclined shaft. Six men are employed under the superintendency of G. M. Mayou.

MARTIN WHITE.—At this mine, on the Mother Lode, adjoining the old Nevills mine, a tunnel is being run to cut the ledge. It is now in 400 ft., and it is estimated that within the next 60 ft. the vein will be reached.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

ADELAIDE.—This mine, on the south slope of Carson Hill, near Robinson's Ferry, has been bonded by W. C. Ralston, of San Francisco, who is now manager of the Stanislaus mine just south.

DONNELAN.—This mine, about two miles north of San Andreas, has been sold for \$22,500 to O. R. Young and associates, of Salt Lake City. The property has been developed by a large open cut, which shows numerous small quartz and calcite veins. A 15-stamp mill, run by water-power on the property, together with the water-rights, ditches, etc., were turned over to the new owners.

ROYAL.—At this group of mines, in Salt Spring Valley, about 2½ miles northwest of Copperopolis, a 20-stamp mill, steam hoist and large engine and pumping plant have been put in, which will largely increase the output of the mine. Thirty men are employed.

KERN COUNTY.

(From Our Special Correspondent.)

GOLD BAR.—On this claim, at Randsburg, the shaft is down 35 ft. in a body of ore 19 ft. in width, which assays from \$5 to \$10 per ton. Sinking is being pushed, and crosscutting from the footwall will soon be commenced.

MAMMOTH NOS. 1 & 2.—The croppings of the ledge in these claims show a width from 4 to 6 ft. A tunnel is now being driven to cut the ledge in Mammoth No. 1, at a depth of 200 ft., which has already reached a length of over 100 ft. A tunnel now 30 ft. in length is being driven on the ledge of Mammoth No. 2, which shows good prospects of vein from 4 to 6 ft. in width.

SUCCESS.—This mine, 1½ miles from Randsburg, has been sold to Los Angeles parties for \$10,000. The mine has been developed by a shaft 168 ft. in depth and a drift of 400 ft.

LOS ANGELES COUNTY.

(From Our Special Correspondent.)

RED ROVER.—The shaft at this mine, in the Cedar District, 3 miles west of Acton, is down 700 ft. The ore from this level shows an improvement on that from the 600. The plant consists of a steam hoist and a 10-stamp steam power mill. About 20 men are employed.

MARIPOSA COUNTY.

(From our Special Correspondent.)

GARIBALDI GOLD MINING AND DEVELOPMENT COMPANY.—This company has filed articles of incorporation. Directors are: Charles H. Fish, J. Staatfeld, Jr., Thomas F. Fish, W. E. F. Deal and H. G. Blasdel. Capital stock is \$1,000,000. This company will operate property in Mariposa County, known as the Garibaldi claim.

MONO COUNTY.

STANDARD CONSOLIDATED MINING COMPANY.—In the Standard Consolidated mine at Bodie for the week ending May 22d, the usual exploratory work was done on the 220, 265, 357, 380 and 600 levels. Some very high-grade ore is being followed in an upraise above the 600 level in the Fortuna vein. Ore is being stoped from the Bullion, Incline, Black and Burgess ledges.

STANDARD MILL STATEMENT.—Ore crushed for the week, 292 tons; average assay vanner tailings, \$11.16; concentrates produced, 2½ tons; assay value, \$51.18; amalgam produced, 1,076¼ troy ounces; value per ounce, \$2.27. At tailings plant No. 1 during the week 541 tons of tailings were treated; at plant No. 2, 346 tons of tailings were treated.

NEVADA COUNTY.

(From Our Special Correspondent.)

ALLISON RANCH.—At this mine, on Wolf Creek, 3 miles south of Grass Valley, the old Cariboo ledge has been encountered. In the sixties this mine produced over \$3,000,000, and has been idle for 30 years until the present company took hold of it. Mackay & Flood own the controlling interest in the company.

GOLD HILL (NEVADA).—This mine, 1½ miles west of Nevada City, is reported to have been sold to the Exploration Company of London for \$50,000.

JUNCTION.—H. Huckins, of Grass Valley, who owns this mine, at the junction of the South and Middle Yuba rivers, has bonded the property to San Francisco capitalists for \$12,000. They will soon begin active work on the property. The mine shows a large ledge, in places 100 ft. wide, but the ore is low grade, and to be made a paying proposition needs to be worked extensively.

POORMAN & HASTINGS.—This firm is preparing to resume operations on the Middle Yuba River. They were working the river at a point near the Delhi mine, about 3½ miles west of Columbia Hill, and had an inclined shaft under the river bed, when it caved in. It is now their intention to build a 12-ft. flume, 750 ft. in length, to flume the entire river.

PLACER COUNTY.

(From Our Special Correspondent.)

DRUMMOND.—At this old mine, near Sugar Pine Mills, 8 miles north of Forrest Hill, a new tunnel is being run to tap the ledge at a depth of 600 ft. Air drills are used.

RIVERSIDE COUNTY.

(From Our Special Correspondent.)

CORONA MINING AND MILLING COMPANY.—This company is building a 10-stamp mill on its property at San Jacinto. The L. E. Porter electro-cyanide process for treating low-grade refractory ores will be put in. This process is now in use at Snow's Canyon, Inyo County, and at Havilah, Kern County, Cal.

SAN JACINTO ESTATE (LTD.), LONDON.—This company owns 27 claims, located about 8 miles northwest of Perris, at an altitude of 2,200 ft. Very little work has been done on the group. H. B. Varcoe, of Perris, the present manager, is erecting a 10-stamp mill. The ore is said to assay from \$20 to \$30 per ton. The above company, which was unsuccessful in developing the Temascal tin mines, has a large capital and intends to develop this property on a large scale.

UTICA.—At this mine, about 8 miles east of Leon, owned by a Riverside syndicate, development work is progressing rapidly. A cross-tunnel on the vein crosscuts the ledge at a depth of 200 ft. and shows it to be over 25 ft. in width. A tunnel will probably be run to cut this vein at the 500-ft. There is water on the property and tests of a large lot of the ore by cyanide process resulted satisfactorily.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

GOOD HOPE.—This mine, at Perris, on the same lead as the Havilah, Jumbo and Santa Rosa mines, is running 15 stamps on about half time. The water used for battery purposes is obtained from the mine, being pumped and stored in a reservoir for that purpose. The vein, which is pockety in nature, is from 3 to 4 ft. in width. New York parties own the mine, which is worked under the superintendency of J. M. Seigafus.

SHASTA COUNTY.

(From Our Special Correspondent.)

HELVETIA.—This mine, 1½ miles southeast of Julian, at an elevation of 4,000 ft., has been bonded by Denver people for \$40,000. A tunnel 1,200 ft. in length is being run to cut the ledge at the 700-ft. level.

TRINITY CONSOLIDATED.—The mill on this property, 8 miles west of Delta, has started up on ore from the mine. A large pumping plant has been put in, and the shaft will be sunk to a greater depth. A tunnel is to be run from the mill to cross-cut the ledge at a depth of 800 ft. As this tunnel

will be about 1,500 ft. in length, it will cross several veins.

SIERRA COUNTY.

HENRIETTA MINING COMPANY.—Notice has been given to the stockholders of this company that at a meeting of the board of directors held May 24th, the assessment No. 1 of 6c., levied March 17th, was set aside.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

APP.—At this mine, on Quartz Mountain, the main shaft is down 900 ft. in a 25-ft. vein of good ore. Stopping is going on at the 800 ft. to supply the mill, which has a capacity of 70 tons per day. About 70 men are employed.

BLACK OAK.—At this mine, at Soulsbyville, the main shaft is down 800 ft. in good ore. Drifting continues north and south on the 700 ft. A regular shipment of 200 tons per month to Selby's reduction works gives satisfactory returns. The mill is to be increased by 10 stamps, and a cyanide plant is to be put in. W. P. Scott is superintendent. About 40 men are employed.

BUCHANAN.—This mine on the "east lode," 10 miles southeast of Sonora, is reported sold to San Francisco people, who, it is said, intend to open up the property on a large scale.

COLORADO.

BOULDER COUNTY.

SLIDE.—This mine was sold at sheriff's sale for \$6,740.50, to Frank Boyd. It is at Gold Hill and has been in litigation for seven years. Negotiations are now pending for its sale at \$350,000. It is chiefly owned by Willard Teller.

CHAFFEE COUNTY.

WHITEHORN CAMP.—This new camp is 12 miles northeast of Salida, five from Nelson and five from Badger, on nearly a direct line from Cripple Creek to Leadville. The Chet property is about ready with a shipment that will run better than \$100 at a depth of less than 25 ft.; the Roy also has ore that will do to ship, ranging from \$50 up. The Angell property has about 2 ft. of ore that is also good, assays showing from 5 to 7 oz. The Cameron is about ready with a shipment that will run better than \$50; likewise the Independence, which recently took up a \$35,000 bond that would not be due for over a year.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

AMERICAN NATIONAL GOLD MINING COMPANY.—A Colorado Springs party has taken charge of a group of properties at Yankee Hill, and is beginning some extensive work.

CLEAR CREEK PLACER COMPANY.—This company operating below Idaho Springs has recently encountered some very rich dirt at bedrock, and is now making a success with the hydraulic rams. An extension of the flume to the big gravel bar 1 mile below the present workings is contemplated.

CONQUEROR MINING COMPANY.—A new mill is in course of erection by this company, at Empire, for the treatment of the vast bodies of ore showing in the mines' workings. Concentration by jigs and vanners will be adopted.

CORNCRACKER MINING COMPANY.—A tram is being built to connect this mine at Empire with the mills. The streak of mineral in one of the lodes of this group is the largest in the county and an immense tonnage of concentrating ore can be moved. The lodes of the group include the Tenth Legion and the Gold Dirt.

DIVES-PELICAN COMPANY.—The machinery on this property at Silver Plume has been removed to be replaced by a more modern plant, so that air compressors and drills can be used.

DORIC GOLD MINES, LIMITED.—This English company driving a tunnel at Georgetown has opened up several blind leads, one of which is now showing a low-grade mineral for the width of the tunnel 5 ft. across. There is also 18 in. of smelting ore. It is claimed that the company is intending to erect a mill on Clear Creek for the operation of the low-grade product.

GRIFFITH.—This property, at Georgetown, is being opened up under a more systematic plan of development with good results. The adits have been driven for about 1,200 ft. each, and connections are being made in various parts of the workings. The lower adit is being pushed ahead for the purpose of reaching the same ore chute as appears in the upper adit, from which a carload of mineral has just been shipped, it netting \$70 per ton. The first and second-class mineral streak is 18 to 24 in. wide. In sinking the shaft a rich streak of mineral came in from grass roots, and under contract at \$8 per ft. there is \$60 worth of mineral coming out for each foot being sunk.

HEADLIGHT.—This old-time mine, at Empire, is being unwatered preparatory to the resumption of its working. The streak is large but low grade. It can be made to pay under the present plan of treatment.

SMITH-MOFFIT COMBINATION.—Since this well-known Denver syndicate began operating mines in Idaho Springs District it has caused a general revival of interest in that section of the State, and it is estimated that over 200 mines tributary to Idaho Springs are now under development.

WILCOX TUNNEL.—The owner of this project is drifting on the blind leads recently cut in the big bore and with satisfactory results. The ore is smelting and carries its values in both gold and silver.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

ANCHORIA-LELAND MINING AND MILLING COMPANY.—The stockholders' meeting was held at Colorado Springs, on May 25th, and resulted in the old board of directors being re-elected as follows: Irving Howbert, S. N. Nye, Theophilus Harrison, W. F. Anderson, Edgar Howbert and F. H. Gay. At a subsequent meeting of the board of directors the old officers were re-elected as follows: President, Irving Howbert; vice-president, B. F. Crowell; second vice-president, W. F. Anderson; treasurer, A. Sutton; secretary, F. H. Gay; general manager, Charles W. Howbert; superintendent, Peter Murray.

INGHAM.—This mine has been shut down temporarily, but it is expected to start up again in about two weeks with a full force and on a more extensive scale than it has been running for the past three months. A clean-up shipment consisted of 10 tons of ore running at \$220 a ton and another lot of the same amount that has been running about \$50.

GUNNISON COUNTY.

(From Our Special Correspondent.)

GOLDEN ETNA.—A crosscut is being driven to intersect the vein, which will probably be accomplished by July 1st.

HIDDEN TREASURE.—A big strike is reported from this property, and a large force of men has been added, most of whom are engaged in sacking the ore. The shaft is being enlarged and transformed into two compartments, and a contract is to be let at once to sink the shaft 100 ft. deeper.

HUMBOLDT.—G. W. Holmes, who has control of the Humboldt under bond and lease, let a contract last week for sinking the shaft an additional 100 ft. Work has commenced and will be pushed to speedy completion.

KELSO TUNNEL.—This old-time property, after an idleness of many months, is to resume operations in a short time under the management of G. H. Whitelaw. A large force of men will be put to work and development instituted on a large scale.

MAMMOTH CHIMNEY.—This property, which recently struck a large body of good ore, has commenced shipments, and has enough ore blocked out to insure a steady production all summer.

MINERAL HILLS GOLD MINING COMPANY.—This company started to work its property at Iris May 24th, after several months of idleness. Water had risen to within 50 ft. of the surface and several days will be consumed in lowering it to the bottom. When this is completed the company will call for bids to sink the shaft 200 ft. deeper in order to determine what the vein carries at that depth.

VULCAN.—Drifts are being driven both ways on the vein at the 200-ft. level, both of which are making a good showing.

LAKE COUNTY.

(From Our Special Correspondent.)

BON AIR MINING COMPANY.—At the Bon Air no work in the drifts can be done until the pumps get to working. At the same time these people are not idle and are arranging to retimber the shaft and make other preparations prior to the arrival of the pumps.

CHENANGO.—These people are pushing work in one of their drifts, where they have opened up a good body of ore from which they expect to ship at an early day.

CORONADO MINING COMPANY.—All its activity at this now celebrated site where all the property was destroyed during the labor troubles, Manager Estey is preparing to rebuild. The opening of the bids will be made this week after which work will be commenced on the buildings at once. The big plant will be rebuilt about as it was before its destruction. There will be a large boiler and engine house and four large boilers will be used. The management figures that by doing preparatory work now the Coronado will be ready to resume underground workings just as soon as the pumps are in place, which will be in about 60 days.

DOUBLE DECKER.—Denver lessees are operating this property, on Yankee Hill. They are drifting at a depth of 250 ft. and have some very good gold assays in connection with their other ore assays.

GRANITE FIRE.—This lively little mining town was visited by a serious conflagration this week. None of the mines suffered any losses, the fire burning only the principal business-houses. The loss will amount to about \$10,000, but those who suffered losses have already begun to rebuild.

KEYSTONE MINING COMPANY.—Manager Johnson is expected home from New York this week, and it is thought that immediately upon his arrival preparations will be made for a resumption on the Rex property by the new company known as the Keystone Mining Company. This work will be watched with interest, as it means the opening up of the territory of Iowa Gulch if operations by the company are carried out successfully.

LEADVILLE & CHICAGO MINING COMPANY.—These people, the owners of the Evansville group, have placed Mr. Frank White in charge of the work to be carried on in that territory this summer. They have a 200-ft. shaft on the property, and will

thoroughly develop a large amount of virgin territory.

MAID OF ERIN.—The Blacksmith shaft of this property is shipping lead carbonate running 65 oz. silver and 45% lead.

NEW ENTERPRISES.—While at this time Leadville does not feel the effects of much new work that is undertaken, and while the pumps and drainage proposition will not be under way for some time to come, still the feeling here is much better and people look ahead for a very prosperous condition of affairs. Several new mining companies have been formed during the past month, and local capitalists are preparing to do a large amount of work this summer. The Argus Mining Company, the latest incorporation, is arranging to put down a new shaft on the Alhambra placer and thoroughly develop that territory.

RATTLING JACK.—Superintendent Sullivan, of the Ibox Company, has started up this property under lease. It lies close to No. 1 shaft of the Ibox, and some very encouraging indications have been met with.

RESURRECTION & SEDALIA.—As previously stated in these columns, the operations at the Resurrection & Sedalia this summer are to be conducted on a large scale and are bound to result fortunately for the section where they are located. Manager Carnahan, of the Resurrection, and Manager Yankee, of the Sedalia, are arranging to sink their new shafts together at an early day. This will lessen the expense, as both shafts are to be the same size and about the same depth.

RUBY.—This property is being worked on bond and lease and a large body of lead ore is being developed. These people believe that they have without doubt the continuity of the Hill Top ore chute. The ore body, it is learned, is opening out nicely in all directions. An offer was made by outside parties last week for the lease and bond, but it was not accepted by the present operators.

ST. KEVIN DISTRICT.—The heavy snows still lying in this section make shipments almost an impossibility. At the same time a great deal of work is being prosecuted, and a lively season is looked for from now on. Several lessees in that locality have ore which mill runs from \$70 to \$123 a ton.

SULLIVAN-MITCHELL.—Denver parties will probably become the purchasers of this mine, located near the London mine. This claim was once sold for \$50,000. Afterward it was relocated by P. O. Sullivan, who still retains control of the ground. The vein in the property has been tapped for over 800 ft., and in 1874 mineral was shipped from this ground.

OURAY COUNTY.

(From Our Special Correspondent.)

FOWLER SMELTER.—All eyes are turned toward the approaching commencement of operations at this smelter. The woodwork of the buildings has been almost completed and a force of men is now engaged in the construction of approaches, at the completion of which the plant will be ready for the reception of ore for treatment. The ore bins have a capacity of 1,000 tons, or a 10 days' supply. The charge floor is equipped with crusher, rolls and grinder for the sampling of ores. This machinery is now being placed in position. The first ore furnace floor is appointed with a 75-H. P. modern engine, blower and furnace of 100 tons' capacity per 24 hours. The furnace flue will be 80 ft. high and is located at one side of the furnace, connected with the latter by means of a large pipe, which discharges its fumes into the bottom of the flue, where they pass through sprays of water by the German process and are precipitated in metallic form. A dust chamber is also in connection with the furnace. The plant will be ready to blow in by June 15th. Any character of ore will be treated except that which is distinctively lead or zinc. Ores will be received and paid for on the usual conditions governing sales to the Denver and Pueblo smelters. Mr. H. W. Fowler, the president and treasurer of the company, has been giving his personal attention to the construction of the plant, which will be under the general superintendency of his son, Edwin J. Fowler, late assistant chemist of the Deadwood & Delaware Smelting Company, of Deadwood, S. Dak.

PITKIN COUNTY.

ARGENTUM-JUNIATA MINING COMPANY.—A strike has been made on the seventh level. A body of ore 6 ft. in width was uncovered which in streak runs 1,000 oz. silver to the ton. This strike was made 1,200 ft. below the surface of the ground, and it is claimed that the chute runs to the surface.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

EMPIRE MASCOT.—A contract has been let for driving the tunnel 100 ft. on this group of mines.

GEORGE REED.—This property is on Boulder Mountain, and since last fall, with a force of only 5 men, has broken 1,000 tons of ore, a portion of which is now sacked and ready for shipment. The ore averages \$4 gold, 20% lead and 150 oz. silver per ton. The main vein was cut during the winter at a distance of 300 ft. from the adit and 200 ft. below surface. A 10-in. streak of ore which was developed with the completion of the crosscut is still in place, and is being stoped out. Shipments begin June 1st.

GLENGARRY & COPPER KING.—These properties, on Boulder Mountain, owned by B. A. Taff,

have been leased and bonded to E. S. Reed for \$10,000. The bond expires November 1st. The contract calls for \$500 worth of work to be completed by October 1st. The claims were located last fall and the first named location is supposed to be the mother vein of Boulder Mountain. In the outcroppings, which average from 4 to 6 ft. in width, numerous cuts have been made, and in every instance disclosed pay ore.

STANLEY.—M. Salmboffer, the owner, has leased and bonded this property above Neigoldstown to Thos. Haslop, for one year, the consideration being \$30,000.

STARKWEATHER.—This property, located in Deer Park, has made a strike of considerable importance. The outcroppings were barren, but the owners ran a crosscut 140 ft., which, upon intersecting the vein, has disclosed a 10-in. streak carrying free gold quite similar to that found in the Gold King in close proximity.

VULCAN.—This group, located in Deer Park, comprises the Vulcan & Kossuth on one vein, the Eureka & Bonnie Kate on another, with the Bryant as a sort of connecting link. Of these the Vulcan is the most prominent, and the owners will soon begin the development of a long tunnel intended to cut the vein at a depth of 300 ft. This property has a 2-ft. vein of quartz in which occur smaller streaks of ore yielding 0.7 oz. gold and 103 oz. silver per ton.

ZUNI.—May 25th the crosscut tunnel on this property cut what is supposed to be the main ore chute of the lode at a distance of 463 ft. from its mouth. Samples of the ore show it to be a crystallized copper, carrying large values in silver.

GEORGIA.

BIBB COUNTY.

KAOLIN DISCOVERY.—It is stated that a deposit of kaolin has been discovered on the line of the Central Railroad, about 12 miles east of Macon. Specimens taken to that city have been submitted to experts and pronounced of a fine quality.

LUMPKIN COUNTY.

G. W. White, of Chattanooga, Tenn., is interested in a new gold mine near Dahlonega, and is planning for its development.

POLK COUNTY.

LADD LIME WORKS.—Ferdinand Reusch, Jr., of New Orleans, La., has purchased these works, at Cedartown. A stock company may be organized to continue operations, after making improvements and adding modern machinery.

IDAHO.

IDAHO COUNTY.

BADGER GOLD MINING COMPANY.—This company has purchased a 10-stamp mill fully equipped with water wheel, vanner, pipe, etc., with agreement that it be completed within 30 days and shipped to the company's property near Elk City. The Spokane parties interested are: B. C. Kingsbury, Patrick Clark, S. Silverman; those from Butte are: H. L. Frank, Charles Smith, G. H. Casey and others. The company owns two claims, the Badger and Homestake, but all of the development work is done on the Badger. It is free-milling ore, and it is said values of about an average of \$15 a ton are expected. A shaft has been sunk on the Badger about 100 ft. and 200 ft. of drifting has been done. The company expects soon to put in a hoisting engine and continue sinking the shaft for development. The ore body is said to be 2 to 7 ft. in width. Mr. S. Silverman will assume the management of the property.

LATAH COUNTY.

BLACKFOOT MINING AND MILLING COMPANY.—A contract has been let for an additional 100 ft. on the Gold Nugget, on which work will commence at once.

GYPSY MINING COMPANY.—This company, operating in the Jerome Creek camp, has let a contract for a shaft to be sunk to test the value of the property.

INDIANA.

CLAY COUNTY.

SOMERS MINING COMPANY.—Last week notices were posted by this company stating that there had been a reduction which brought mining down to 47c., to take effect at once. This makes the price 4c. lower than the district price. The miners refused to go to work, and the mine is now closed.

MADISON COUNTY.

ALEXANDRIA MINING AND EXPLORATION COMPANY.—A compromise has been reached in the litigation growing out of the explosion of natural gas in Alexandria in March and September, 1894, by which two business blocks were destroyed, two persons were killed, and several were injured. The defendant is the Alexandria Mining and Exploring Company, and suits were filed calling for a total of \$70,000.

MICHIGAN.

COPPER.

QUINCY MINING COMPANY.—At the meeting of this company, June 2d, the following directors were elected: Thomas F. Mason, George T. Bliss, Cleveland H. Dodge, T. Henry Mason, Nathan H. Daniels, Charles J. Devereaux, Samuel B. Harris, of Michigan.

IRON-MARQUETTE RANGE.

BUFFALO GROUP.—This group of mines, comprising five properties, shut down last week, throwing 250 men out of work. The suspension was caused by the dullness in the ore market, and is for an indefinite period of time.

PENN IRON MINING COMPANY.—This company has closed down its Curry mine, near Norway, and discharged the 75 men who had been at work there.

IRON—MENOMINEE RANGE.

DUNN IRON MINE.—This mine has been closed down and the pumps taken out. Only a small force, about 50 men, had been employed this season.

MINNESOTA.

(From Our Special Correspondent.)

IRON ORE SHIPMENTS.—The shipments of iron ore from Duluth are now averaging about 625 cars of 24 tons daily, or 90,000 tons a week. From Two Harbors they have been small the past week, reaching but nine cargoes. From Superior, the Mahoning mine is shipping 200 cars a day, making total shipments from Minnesota iron mines average not less than 175,000 tons a week. This shows why the mines of the Gogebic and other ranges are doing little or are shutting down waiting for ore sales.

The cargo record for the Upper Lakes has been beaten by the new steel ship *Andrew Carnegie* with a cargo of 277,160 bu. or 5,592 tons of grain, on a draft of 16 ft. The *Queen City* has also taken from Ashland 5,424 net tons of ore and the *Siemens*, of the Rockefeller fleet, 5,341 net tons, while the barge *Constitution* has taken 4,713 gross tons. All these are new vessels and show the great increase in the loads taken out of Lake Superior.

The docks of the Duluth, Missabe & Northern road at Duluth loaded in 24 hours ending at midnight May 30th, 38,000 gross tons into ships, the best record yet made. This company does not permit its dock or fleet to be operated in loading on Sunday.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

COMMODORE MINING COMPANY.—This mine is reported to have sold 50,000 tons of ore, and it is mining and shipping at the rate of 750 tons a day. Some 35 men are employed.

MAHONING ORE COMPANY.—This company has put a second shovel in the ore and is now sending out about 200 carloads daily, a rate it will keep up for a long time.

OHIO MINING COMPANY.—The sale of ore that is being sent forward from this mine amounts, so far as arranged as yet, to only 5,000 tons, and this is being loaded by hand shovels and wheelbarrows into cars. Wages paid at the mine are from \$1.25 to \$1.40 a day, and some 50 men are employed. It is thought that when this shipment has been completed work will continue.

ROBERTS MINING COMPANY.—The contract for a track from the Duluth and Iron Range main line to this new mine has been let, and work is under way with a good force. The track is but a short one, however, and will be completed ready for shipments in July. It is understood that 50,000 tons will be shipped this year.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

CHANDLER IRON COMPANY.—This company has so far this season shipped 110,000 tons, and would have done much better but for the necessary spasmodic working, there being trouble about cars and dock room, alternately, so that it has been hard to keep the loading shovels in stock piles at work with any degree of satisfaction.

PIONEER MINING COMPANY.—This company, which some three weeks ago shut down its mine indefinitely, has resumed this week with full force and will mine steadily. It will ship the hoist and work out the stock pile of 165,000 tons very gradually. Some 250 men have been put to work.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—Not only did the top price of zinc drop 50c. per ton last week, but 50c. on nearly all grades. The highest price paid was \$22.50 per ton. Lead ore brought \$20 per thousand pounds up to Friday, the bulk of that ore selling later at a dollar advance, the market closing the week firm at \$21 per thousand pounds. The Argentine Reduction and Refining Works wants soft Missouri lead and seems willing to pay any price necessary to secure a large quantity each week.

The corresponding period of last year zinc ore sold at \$21 per ton top price and lead ore brought only \$16.50 per thousand pounds. The district shipment was an increase of 87,930 lbs. of lead ore and a decrease of 836,180 lbs. of zinc ore compared with the preceding week, but compared with the corresponding period of last year it was an increase of 194,630 lbs. of lead ore and 1,132,880 lbs. of zinc ore. Considerable zinc ore was left over at Galena and Midway, caused by the fall of prices, a large number refusing to sell at the prices. There is very little surplus lead ore in the entire district, not over 500,000 lbs.

Following are the sales of zinc and lead ores for the week ending May 29th: Joplin zinc, 1,201,580 lbs.; lead, 215,490 lbs.; value, \$17,142. Carterville zinc, 823,910 lbs.; lead, 233,510 lbs.; value, \$13,146. Webb City zinc, 574,910 lbs.; lead, 53,070 lbs.; value, \$6,863. Galena zinc, 2,670,000 lbs.; lead, 673,800 lbs.; value,

\$38,100. Aurora zinc, 675,000 lbs.; lead, 20,000 lbs.; value, \$5,017. Alba zinc, 52,000 lbs.; value, \$546. Oronogo zinc, 140,840 lbs.; lead, 3,160 lbs.; value, \$1,549. Stotts City zinc, 36,180 lbs.; value, \$380. Zincite zinc, 19,150 lbs.; value, \$201. District totals for the last week: Zinc, 6,193,570 lbs.; lead, 1,119,030 lbs.; value, \$83,021. District totals for 21 weeks: Zinc, 136,161,240 lbs.; lead, 25,058,200 lbs.; value, \$1,714,488.

BREWER BROTHERS.—On the Warren & Snapp lease they are sinking a pump shaft on a drill hole that showed up good zinc ore from 136 ft. to 160 ft., where they stopped drilling in good ore. They are down with the shaft to 135 ft., and are getting some slimes in open ground.

CHATHAM MINING COMPANY.—They have about finished their large pumping plant on the north end of the lease, and will start up the last of the week. Two good prospects have been developed on the lease, and as soon as the water is out five concentrating plants will be started up.

CONNOR REALTY COMPANY.—This company, of Joplin, has been incorporated with a capital stock of \$5,000, by Thomas Connor, John F. Wise and Charles W. Glover, to deal in mining lands and machinery.

CRAGG, SMITH & COMPANY.—On the Blue Goose they have been sinking a prospect shaft, and are down 118 ft., after going through 14 ft. of rich dirt with very little water. They will start to drift next week and make their first turn-in.

HOO HOO MINING COMPANY.—This company, on the Becky Sharp lease, is drifting on a rich face of pebble zinc ore. They clean up their dirt on hand jigs, and last week made a turn-in of 15 tons of ore.

NEBRASKA COMPANY.—This company, on the Becky Sharp lease, is drifting at 135 ft. on a large face of pebble zinc ore. Last week they built a wash place and put in three hand jigs, and will make their first turn, in this week.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

COLEMAN, BELL & COMPANY.—They are down to a depth of about 70 ft. at their shaft east of the old Little Nugget mine, on the Kentucky land, and are getting zinc ore.

HALE & COMPANY.—They have been engaged in putting up a hoister at their shaft on the American Lead & Zinc Company's land and now are sinking as fast as possible. The shaft is a little east of No. 4 shaft in the Minor & Rogers land and are expecting to strike the same run of ore.

LILES, SCOTT & COMPANY.—They are sinking their shaft on the Liles land down to greater depth, and are getting into a fine body of zinc ore. The shaft is 113 ft. deep, with rich ore in the bottom, and they will sink through the ore before drifting.

MINOR & ROGERS.—The No. 4 shaft on the Minor & Rogers land continues to be the biggest producer of the camp and the present indication is that it will in a short time equal any in the district when it has been thoroughly developed.

RUPPEL BROTHERS & COMPANY.—This plant was destroyed by fire two weeks ago. They have rebuilt it, and will start this week and make their usual turn-in.

WHITAKER & COMPANY.—Their shaft, on the Black land, has been sunk deeper and is down over 100 ft. into rich zinc ore and will make a good output of ore this week.

MONTANA.

DEER LODGE COUNTY.

CARBONATE EXTENSION.—This property, in Zosel District, which is being operated under lease by John Youlden and others, is producing some good ore, which is hoisted by a horse whim. They have out about a carload of ore, which is said to contain satisfactory values.

HARRINGTON & COMPANY.—The Carbonate Hill, in Zosel District, is being worked by this firm. At the old workings a depth of 420 ft. has been reached and the ore taken out is of good quality. They are going to the 500 mark, which is one of the requirements of the lease, and they are now making about 4 feet every 24 hours. They have a steam hoist on the south incline.

FLATHEAD COUNTY.

GOLD FLINT.—The south drift has been extended 30 ft. and the north drift 18 ft. from the face of the tunnel, with rich pay chutes running through the ledge. The force has been increased by the addition of six men. More and larger ore bins are being constructed and development work pushed rapidly.

LEGAL TENDER.—This fractional claim is showing up well in silver and lead, and work is being pushed. Tunnels are being run and development work is progressing.

ORE GRAND.—A strike has been made on this property, on Keystone Hill, near Sylvanite, by Jansen & Eerlandson, showing free gold in the ore. The lead was struck on the hanging wall and indications point to a ledge 6 ft. in width. The Klammath, Rambler and Eberhardt are adjoining claims.

SULLIVAN GROUP.—This group is composed of the Shylock, Hamlet and Hope mines. The property is at present bonded to Spokane parties.

GRANITE COUNTY.

WEASEL GULCH MINING COMPANY.—This com-

pany's holdings comprise 60 acres of valuable placers in Bilk Gulch, 20 miles northwest of Drummond, and are being worked by the hydraulic process. The company put in a plant two years ago costing \$60,000, which carries the water 800 ft. high to a large storage reservoir on a hill. At the present time the company has a force of 20 men engaged in washing gravel.

JEFFERSON COUNTY.

AZTEC MINING COMPANY.—The Stray Horse is one of the leading mines near Winston and will employ some 90 men this summer. It is controlled by the above company, a corporation composed of Helena capitalists, which now has a force of men at work grading a new road.

COMET.—This mine has been pumped out to the 300-ft. level and is being worked steadily, and the company is thinking of pumping the water out of the lower levels and working them.

ELMO MINING AND DEVELOPMENT COMPANY.—This company has 4 good claims. It is reported that one of these claims, the New Year, is a rich lead for which a crosscut from the main tunnel (which is now in 300 ft.) has been started and lacks about 60 ft. of tapping a rich lead.

HOMESTAKE.—Ore was discovered recently on this property near the surface and widened out as it went down. To a depth of 75 ft. the ore is of an oxide nature, carrying gold, and below that is changed to a sulphide, carrying at the 100-ft. level about 2% copper. The company has announced its intention to put in a steam hoist this year and continue the sinking of the shaft 500 ft. and thoroughly develop the property.

IRON MASK.—W. W. Atchinson and Jack McCloud shipped a carload of silver-lead ore recently from this mine, which they are working under lease, that is said to have netted \$688 clear of all expenses.

LILY.—A company composed of Major Gleason, Robt. Hamilton and Wm. Edgar is working this mine under a lease. Its owner, E. H. Hazelton, of San Jose, Cal., is expected there in a short time to make arrangements for treating a large body of ore which is of too low a grade for smelting. There are about 12,000 tons of \$12 ore already blocked out in this mine, as far as development work has been extended.

NEW ELKHORN MINING COMPANY, LIMITED.—According to the report of Manager Walter S. Kelley for the month of March, the mill work performed was as follows: Dry ore panned, 1,094 tons; average assay value, \$36.43; average tailings, \$4.02; average per cent. saved, 90.69; number doré bars produced, 32; number ounces fine silver produced, 33,522; number ounces fine gold produced, 26,826. The result of the month's operations is given as follows: Net value of bullion shipped, \$23,532; returns from ore shipped, \$4,384; total receipts, \$27,916; current expenses, \$26,979; profit for March, \$1,837.

NEVADA.

HUMBOLDT COUNTY.

SADORUS.—These placer mines were sold recently by W. H. Patterson, of Reno, to Rek Lee & Company, of Winnemucca, and the purchasers took immediate possession.

STOREY COUNTY—BRUNSWICK LODGE.

CHOLLAR MINING COMPANY.—The official report of operations in the mine for the week ending May 22d is as follows: Shaft No. 1 has been sunk 5 ft. on the incline; total depth, 907 ft.; the bottom is in porphyry showing some quartz. 300-ft. level—Are working on the 7th floor in the upraise; there is no change in the ore stopes. Advanced west crosscut No. 15 ft.; total length, 45 ft.; the face has reached the footwall. 400-ft. level—On the 7th floor they continue to extract ore of fair grade. 500-ft. level—The south drift has been advanced 34 ft.; total length from north line, 350 ft.; face is in porphyry. Twenty-five feet back from the face of the drift they struck a small seam of quartz which they followed. The streak is from 2 to 6 in. wide and assayed from \$4 to \$64. 600-ft. level—Advanced south drift 33 ft.; total length 45 ft.; the face is in porphyry and seams of quartz. Have saved from all points and shipped to the Nevada mill during the week 276 tons and 750 lbs. of ore, assaying as follows: Top car sample, gold \$19.12, ounces fine silver 18'12; wagon sample, gold \$17.77, ounces fine silver 20'69; battery sample, gold \$20.72, fine ounces silver 17'36. Have shipped to the United States Mint 3 bars of bullion of the par value of \$10,377.86, of which \$4,939.39 was gold.

STOREY COUNTY—COMSTOCK LODGE.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—The official report of the operations in the mine for the week ending May 22d is as follows: 1,000 level—The west crosscut has been advanced 30 ft., passing through softer porphyry and clay seams; total length, 255 ft. 1,550 level—The double compartment incline upraise No. 1 has been carried up along the footwall 14 ft.; total height, 82 ft.; top of opening in porphyry with quartz assaying from \$3 to \$4 per ton. 1,650 level—From the ninth floor south drift the upraise has been carried up 8 ft., passing through a quartz formation assaying \$1 to \$2 per ton; total height, 33 ft. From incline upraise No. 1 the upraise has been carried up on the footwall 6 ft., passing through ore showing an average width of 3½ ft.; total height above the sill floor, 37 ft. Our opening on the top shows a length, north and south, of 10 ft. and a width of 3½ ft. of good ore. The average assays from all around this top opening are \$30.05 per ton. We have extracted

from this point and from the south drift from No. 2 upraise 71 tons of ore assaying, per mine car samples, \$64.20 per ton. The south drift has been extended along the footwall 13 ft., passing through porphyry and quartz assaying from \$2 to \$10 per ton; total length, 47 ft. All along the west side of this drift on the footwall we have worked upward in the ore streak, which was 1 ft. wide, and continued with the north drift from upraise No. 1. All the ore found here has been removed, which amounted to a few tons, assaying from \$40 to \$50 per ton.

The total extraction of ore for the week amounted to 71 tons, the average assay value of which, per samples taken from the cars when raised to the surface, was \$62.37 per ton.

NEW MEXICO.

COLFAX COUNTY.

URRACA & BONITO DISTRICT.—This mining district is near Cimarron, J. L. Abreu has opened up a new prospect to the west of the Fanny, and is at work sinking a 30-ft. shaft, expecting to strike the vein at that depth. Messrs. Logan, Van Allen and Lester started work about a week ago on the placers and are doing well. Messrs. Fraser, Thurman and Davidson, Cripple Creek prospectors, have located some claims. Jones and Thompson have returned from Raton and gone to work on the Missing Link.

RIO ARRIBA COUNTY.

CANYON DE CHAMA GRANT.—By the United States Supreme Court decision last week in the case of the Canyon de Chama grant nearly 500,000 acres of excellent prospecting territory in this county is thrown open to mines.

NEW YORK.

ERIE COUNTY.

NORTH COLLINS OIL AND GAS COMPANY.—This company, of North Collins, was incorporated May 29th. The capital stock is \$20,000. Directors, William J. Hovey, of Buffalo; Joseph Thiel, Herbert T. Auerback, Chas. M. Ashby and Jennie E. Auerback, of North Collins.

NORTH CAROLINA.

BURKE COUNTY.

(From Our Special Correspondent.)

KING.—This gold mine, operated by Messrs. Helsing & Whitney, of Syracuse, N. Y., has struck ore which assays \$60 per ton. The mine is near Morganton.

SCOTT'S HILL.—This property is leased by Frederick McDowell, of Charlotte, who is erecting machinery.

CABARRUS COUNTY.

(From Our Special Correspondent.)

HARTSELL.—This property is bonded to R. Cox and others, and will be operated in a small way until developments justify otherwise. The prospect is good. They are down 35 ft. on a quartz and brown ore vein averaging 3 ft. in width and assaying from \$5 to \$18 per ton in gold. Levels have been driven out 70 ft. and surface cuts for over 1,000 ft., showing the same quality of ore, it is said.

ICENHOUR.—This gold mine has been bonded to Colorado parties who have started up to unwater and sink.

MCMACKIN.—This mine, near the Troutman, is being opened up and examined by Hon. Fred Betts, of Denver, Colo.

TROUTMAN.—This gold mine, near Gold Hill, is developed in a systematic manner by Pueblo, Colo., parties. They have a vein of auriferous zinc blende and iron pyrites. Eight stamps are kept in operation on the ore.

GRANVILLE COUNTY.

(From Our Special Correspondent.)

CHEATEM.—This mine is one of the most important pieces of development work going on in the State. They have compressor and air drills and are down 100 ft. on a 1-ft. quartz vein which shows good values. At this level drifts are being driven each way on the vein. No reduction works will be erected until they have sufficient ore to justify it. The work is in charge of Col. E. B. C. Hambley, formerly of London, England.

JACKSON COUNTY.

(From Our Special Correspondent.)

SAVANNAH MINING COMPANY.—This company, under the management of S. A. Jones, is mining and shipping corundum from Dillsboro. The mine is about 7 miles from the above-named station and is producing well. The company owns extensive low-grade copper properties which are under bond to a Western copper-producing company which will investigate thoroughly.

TURKEY KNOB CORUNDUM COMPANY.—This company owns property 12 miles from Dillsboro, a railroad station on the Western North Carolina Railroad. Henry C. Turnbull, of Baltimore, Md., is president. They are developing and prospecting with a view to extensive operations.

MECKLENBURG COUNTY.

(From Our Special Correspondent.)

MECKLENBURG IRON WORKS.—Machinery is being shipped to the Zeitenfelter plant in White County, Ga., and Mr. William Reid, of Charlotte, has been engaged to erect it. He left on May 26th.

MOORE & ADDICK.—This mine, near Charlotte, is being opened up by local capitalists.

MONTGOMERY COUNTY.

(From Our Special Correspondent.)

APPALACHIAN.—This mine, adjoining the Russell, is owned by Chicago parties who have interested several gentlemen at present making investigations.

RUSSELL.—Here they continue to develop and pile up low-grade ore. It is reported that the company intends to put the 20-stamp mill and the 40 stamp mill together and mill at the rate of 150 tons per day.

SALLIE COGGINS.—At this mine they have developed what to all appearances seems to be a remarkable deposit of slate ore carrying zinc blende, galena, sulphurets of iron and gold. The belt uncovered by hydraulic mining is some 50 ft. in width and has been sunk on about 20 ft. The mine is owned by Capt. Wm. Muhlall and associate of Pittsburg, Pa. Concentrates, a few pounds made by hand, assayed \$6,000 per ton. The mine has produced about 30 cts. per cubic yard in gold from the surface dirt together with some very rich specimens.

MOORE COUNTY.

(From an Occasional Correspondent.)

J. M. Stephens, of Sanford, has struck a 7-ft. vein in slate, near that place that shows good values in gold. The walls are solid granite and all the branches in it show values. It is believed another vein exists on the same property, as gold in dirt and gravel has been found that is thought to have come from the sandstone. Prospecting for the vein will soon begin.

STANLY COUNTY.

(From Our Special Correspondent.)

CRAWFORD.—At this gold mine they continue to find nugget gold. But few men are employed and the property is operated on a small scale, due, it is said, to pending litigation which promises to expose the methods of some New York business men. A full account will be given in proper time.

LITTLE FRITZ.—This gold mine continues to be operated together with the mill, it is said, with profit. They have been in successful operation now for several months.

LOUDER.—Here a party of six St. Louis, Mo., gentlemen are engaged making developments and test runs of the ore on their 10-stamp mill. They have been bothered by a scarcity of water in consequence of which they will put in a pump and pipe line to a creek one mile away. Mr. McClure, formerly connected with the great Granite Mountain mine, is interested and is here from the West.

UNION COUNTY.

(From Our Special Correspondent.)

HOWIE.—This gold mine, some 12 miles from Monroe, the county seat, has been under consideration by English capitalists. The ore body is reported as some 400 ft. in width with pay streaks therein that have been worked at a profit. The average value of the ore is reported at \$14 per ton. A Wiswell mill has been in use at the mine with good results. The mine has a record of several hundred thousand dollars.

INDIAN TRAIL WORKS.—The works erected at Indian Trail for the purpose of demonstrating the extraction of sulphur and gold from sulphurets and ore by the Eames electrical process has fallen into the hands of a company under the name of Boston and North Carolina Development Company, which is offering stock for sale. It is reported that Chas. Torch, a wealthy wholesale crockery dealer of Baltimore, Md., is interested.

WILKES COUNTY.

(From Our Special Correspondent.)

LAURENCE GOLD MINING COMPANY.—This company's Henderson mine is a new and important prospect for gold in the way of a vein opened up by J. C. Henderson on his property, near Knottville. Pennsylvania people have taken hold and formed a company under the name of the Laurence Gold Mining Company. They are developing and erecting machinery.

OREGON.

BAKER COUNTY.

FLAGSTAFF.—The crosscut from the 670-ft. level is advancing rapidly toward the lode. The water is increasing, and a full mill supply is expected when the lode is cut. In the meantime, the mill is run on half time. There is a large amount of ore developed in the mine.

JACKSON COUNTY.

BARDEN.—This mine, on Kanawha Creek, has been leased for a year by Messrs. Perham & Obenchain, and a force of men will be put to work as soon as repairs on the mill are completed. This mine has been a good producer in the past.

SHOESTRING.—Work at this mine, in Murphy Gulch, on Evans Creek, has been temporarily stopped, pending negotiations for a sale of the property. This mine was recently bonded to S. D. Brown, of Portland, and 100 ft. of development work was done in four weeks.

JOSEPHINE COUNTY.

MOUNTAIN EAGLE.—Belding & Dowell, with their new mill, are still working on the ores of this mine on Green's Creek. This is a 5-stamp mill, with two Gilpin County bumping tables for concentrating the

sulphurets. The ledge is about 2½ ft. in width, and carries about \$10 in free gold.

PENNSYLVANIA.

ANTHRACITE COAL.

DOUGLASS STEWART ESTATE.—This estate comprises some of the original William Penn lands in Luzerne County, near Shickshinney, on which indications of coal have been noticed. Recently prospecting was begun by two men who uncovered an outcrop of a vein of good quality of coal 5 ft. thick. They tunneled into it for 75 ft. and found it to hold its own and then opened higher up the mountain, with the result of finding another vein 4 ft. in thickness. This discovery promises to open up an entirely undeveloped and unexpected field, of which the extent is unknown.

J. S. WENTZ & COMPANY.—The lease of this firm with the landowners of the Hazlebrook Colliery expired May 31st, and it is possible the mine will be abandoned. The operators have been endeavoring to secure a reduction in the royalty, but the landowners thus far have given no encouragement. One vein has been worked out entirely, and the operators contend that it costs too much money to profitably mine the remaining seam at the present rate of royalty. Three hundred men are employed there.

LEHIGH COAL AND NAVIGATION COMPANY.—The Lykens Valley vein was cut in a tunnel being driven by this company, at Christ's High Mines Colliery, at Tamaqua, proving 6 ft. thick, and of excellent quality. This is the first find of this vein at a workable thickness in that basin. Should the Lykens Valley, upon further investigation, prove as favorable as at the point it was intersected, it will be profitable to the operator.

LEHIGH & WILKES-BARRE COAL COMPANY.—Officers of this company announce that the water is under control in the Nottingham mine at Plymouth, having been lowered sufficiently to admit of working coal from the Ross vein, consequently work will be resumed in that portion of the mine. This will give employment to about 400 men and boys.

STRIPPING OPERATIONS.—Dick & Company, contractors, on May 31st started a stripping operation at Eckley, and Crawford & Company started another large coal excavation at No. 2, Drifton. These operations will give employment to 400 men, and will open up several new coal veins.

WYOMING LAND AND IMPROVEMENT COMPANY.—The Fuller coal-breaker at Wyoming, operated by this company, of Scranton, was destroyed by fire on May 27th. The flames broke out at 1 o'clock and in an hour the structure was totally destroyed. The loss is estimated at \$50,000. About a year ago the mine was leased from the Delaware, Lackawanna & Western Company by a company, of which William Griffiths, of West Pittston, is president, and Dr. J. N. Rice, of Scranton, general manager.

BITUMINOUS COAL.

HILL FARM MINE.—This mine, near Dunbar, made memorable by the disaster seven years ago, in which 31 men perished, is again causing trouble. The mine has been on fire since the disaster, but the flames have been kept back by frequent flooding and by brattices, but are beyond control now. The flames are coming out of the mouth of the pit. Representatives of the Philadelphia Company, which owns the mine, have been on the ground for a week, and have had mine inspectors Connor, Louttit and Callahan at work, but the only decision reached is that the mine will have to be abandoned.

JOSEPH WALTON & COMPANY.—The 400 miners employed at the Second Pool mine of this company, just below Lock No. 3, on the Monongahela River, struck last week against a reduction of ¼c. a bushel in the mining price. They were receiving 2c. per bushel and the firm wanted this price reduced, they claiming they could get their coal loaded and the flats pumped until high water for 1½c. per bushel.

MINERS' CONVENTION.—The convention of the coal miners of the Pittsburg District adjourned June 3d. A strong effort was made by a large contingent to have an immediate strike declared, but the influence of National President Ratchford and District President Dolan prevented it. In the resolutions that were adopted the miners reiterate their demand for 69c. per ton, and place the entire matter of securing it in the hands of the national officers, who will not declare a strike until the demand for coal at the lake ports sets in. It is believed that this condition will arise in less than three weeks.

MITCHELL COAL AND COKE COMPANY.—Three hundred coal miners employed by this company at Gallitzin have struck because the company gave a notice of a reduction of 5c. a ton on coal used for coke. Since then the company has announced a general reduction of 10c. a ton.

REDUCTION IN COAL PRICES.—Recently General Superintendent of Motive Power of the Pennsylvania Railroad F. D. Casanave notified the coal operators in the Westmoreland, Mountain and Clearfield bituminous district who furnish coal to the railroad company, that the company would expect a reduction on June 7, from 85 to 80c. a ton on Westmoreland coal, and from 75 to 65c. a ton on Mountain and Clearfield coal. On May 31st a number of the operators met Superintendent Casanave in Altoona to discuss the proposition. The operators argued that the proposed reduction in price would necessitate a reduction in wages of miners and invite a strike, something neither the

railroad company nor the operators want. The order for the reduction comes from Philadelphia, and the whole subject will be referred there for a final decision.

CHESTER COUNTY.

CHESTER COUNTY PLUMBAGO AND MINERAL PAINT COMPANY.—A bill in equity has been filed in the Philadelphia Common Pleas Court by F. A. Von Boyneburck, J. L. Eldridge, John Reese and F. E. Hallahan against this company, asking that a receiver be appointed to close out the business and the court distribute the proceeds. The company owns mining leases, franchises, etc., at Pikeland.

SOUTH DAKOTA.

LAWRENCE COUNTY.

BLACK HILLS GOLD MINING AND MILLING COMPANY.—Frank Bryant has leased four claims at Ragged Top, half a mile northeast of Dacy's shaft, to this company, composed of a number of leading business men of Newcastle, Wyo., with an option for 90 days.

HAMBURG No. 2.—A recent discovery of free-milling gold ore was made by John Doyle on this property, situated one-half mile east of the Dacy shaft, at Ragged Top.

LITTLE BLUE.—The regular Yellow Creek vein of ore, about 6 ft. wide, was encountered recently in the face of the tunnel on this lode. Ten or twelve tons of ore had been taken out, of an average value of \$80 per ton gold and 4 oz. silver. The ore body crosses the claim near the south end at an angle of about 40°, which will give the owners of the claim about 400 ft. of ore 6 to 8 ft. thick.

WASP No. 2.—Recent assays that have been obtained from ore found in this mine, on Yellow Creek, indicate that silver may become the predominating metal in the camp, especially on that ore level. The chute in which the silver ore is found is 2 ft. thick and 6 ft. wide.

PENNINGTON COUNTY.

BENEDICT.—On this property, which is located 5 miles west of Rochford, permanent development is being pushed forward, and the owners, Messrs. Hooper & Mendinhal, have exposed a vertical vein 40 ft. in width, which will return an average of \$3 per ton and upward, free-milling.

STANDBY.—On this property, near Rochford, 30 stamps are dropping and the ore being milled is said to be of a better grade than any crushed heretofore. Aside from the free-milling caught on the amalgamating tables, the ore is heavily charged with iron sulphide, which is concentrated down to within 3% of pure iron.

TENNESSEE.

CLAIBORNE COUNTY.

TAZEWELL CEMENT WORKS.—These works, at Tazewell, were sold at public auction recently to C. W. Pelton, of Christiansburg, Va., who will at once open them up and give employment to a number of unemployed men. The plant has been idle for some months.

TEXAS.

HARRIS COUNTY.

TEXAS GRAPHITE AND ASBESTOS COMPANY.—This company, with a capital of \$100,000, has been incorporated at Houston by O. E. Nelson, N. S. Schmidt and W. J. Bradu.

NAVARRO COUNTY.

TEXAS PETROLEUM OIL COMPANY.—This company, with a capital stock of \$100,000, has been incorporated by James Garitty, J. E. Whiteselle, Charles H. Ailyn, J. L. Autry, H. E. Kinsloe, G. H. Moore, of Corsicana; J. T. Wood, R. H. Chatham, of Waco; R. Oliver, Groesbeck; William Euders, of Dallas.

UTAH.

(From Our Special Correspondent.)

SHIPMENTS FROM SALT LAKE.—Last week there were shipped East 21 cars, or 819,573 lbs. of base lead-silver bullion and 35 cars, or 712 tons of lead-silver ore. For May, the eastbound shipments were 91 cars, or 3,498,346 lbs. base lead-silver bullion; 5 cars, or 117,798 lbs. copper bullion; and 131 cars, or 2,955 tons lead-silver ore.

TREATMENT AND FREIGHT TARIFF.—No topic ever caused more stir and antagonism in Utah mining circles than the advance in treatment and freight on lead-silver ore, both of which took place, practically, at the same time—the middle of May. This has given a gloom to the bright outlook of the first of the year for Tintic, Bingham, Park City, Fish Springs and the Deep Creek area. Among the large shipping mines working forces are being reduced, mills closed down, and the immediate future seems unpromising. In the bad times prevailing throughout the United States for the past few years, Utah thus far has weathered the storms magnificently. There have been no bad failures, no labor difficulties, nor serious frictions with smelters or railroads. At this writing no prediction can be made of the outcome, as consultations between railroad officials, mining and smelting men are now in progress. It is most unfortunate that the advance in treatment and freight tariffs occurred simultaneously with that in powder, and immediately following the Western Federation of Miners' fifth annual convention, at Salt Lake.

To round out the list of now pressing hardships, the first state legislature passed an 8-hour law, the 10-hour underground shift was quite common, and last the drop in silver.

BOX ELDER COUNTY.

(From Our Special Correspondent.)

PROMONTORY COPPER FIND.—Joseph Obendorfer, of Salt Lake City, has uncovered an ancient prospect hole on Promontory Point, in Great Salt Lake, 12 miles south of Blue Creek, on Central Pacific Railroad, showing a 25 ft. ledge under the hanging wall, of which 1½ ft. go 20% copper and 1 oz. silver. Underlying this is a stratum of compact lime, and then 12 ft. of mineralized quartz with copper and galena. The country rock is lime. Men are now at work testing the worth of the ground. Not far away a prehistoric copper slag pile, formerly occasioned some little stir.

IRON COUNTY.

(From Our Special Correspondent.)

STATE LINE DISTRICT.—The new post-office, State Line, is connected with the Oregon Short Line at Millford, 75 miles distant, by a wagon road, now in good condition, over which there is considerable travel. When ore was discovered last fall mine prices were asked for prospects and no transfers were effected. This status has changed. Last November \$100,000 was the figure placed on the Creole, while a week ago a two-thirds ownership was secured by Knight Brothers & Company for \$24,000 from McDonald & Millet. The Creole is in the silver belt and has a 20-in. seam carrying 200 to 400 oz. silver and \$14 gold. Numerous deals of proper ties in the gold area are pending. With prices in keeping with the times there is likelihood of considerable activity this season.

JUAB COUNTY.

(From Our Special Correspondent.)

FOUR ACES.—On Monday of last week an 18-ton ore lot was settled for on 30% lead, 45 oz. silver and 5½c. gold. It is not difficult to remember when less than \$1 gold per ton was a smelter perquisite. This shipment netted \$448.26.

MAMMOTH.—Several of the big Tintic mines, as is well known, are erratic in their metallic yield; changing from gold to silver, copper and lead. Just now fortune seems to favor the Mammoth, as a seam in this zone is being opened, the products from which carry chiefly gold values. Some 300 tons of \$60 mineral are going to the smelter from this working. The Mammoth mill closed down last week and will not start up till freight and treatment rates are readjusted.

NEW EAST TINTIC RAILROAD.—Connecting the O. S. L. and R. G. W. joint station at Robinson with Mammoth mine is the New East Tintic Railroad, now being extended to the Star Consolidated. Before the end of 1897 this road will have the ore and supply traffic of several mines; to handle this increased business the sharp curves are being taken out in the 2-mile climb between Mammoth mill and mine.

TINTIC SHIPMENTS.—For week ending May 29th: Bullion-Beck, 15 cars ore; Centennial-Eureka, 3 cars ore; Ajax, 5 cars ore; Mammoth, 7 cars concentrates; Swansea, 5 cars ore; South Swansea, 7 cars ore; Star Consolidated, 2 cars ore; Four Acres, 1 car ore; Dragon Iron, 1 car ore.

PIUTE COUNTY.

(From Our Special Correspondent.)

DALTON.—On May 26th, at a meeting in Salt Lake, the stockholders decided to resume work forthwith. The present officers are: Frank D. Hobbs, president; C. D. Dart, vice-president; Dr. Charles M. Garrison, secretary; A. H. Adkison, treasurer; O. R. Young, manager, all of Salt Lake. There are five claims and a millsite, all patented, in the Marysville region. In 1890 Dalton was the scene of a gold excitement, due to finds of bonanza high grade, \$150 to \$1,500 per ton, in one month the company netting \$70,000. Afterward the vein disappeared in fault, characteristic of the region. Exploration last year again found paying mineral, and it is now proposed to drive a working tunnel, which will also drain the mine.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

BINGHAM COPPER COMPANY.—At a special stockholders' meeting, held at Salt Lake in May, the directorate was reorganized with Arthur Leask, of Chicago, president; George E. Lee, Bingham, vice-president and manager; O. S. Richardson, Chicago, treasurer; L. C. Jeffrey, Bingham. Resumption of work was determined upon in Starlur ground, for which a steam hoist and pump are ordered.

HIGHLAND BOY.—Ten days ago the face of No. 5 tunnel broke into the ore zone—here a strong pyritic body—580 ft. from mouth. A carefully taken sample from the first 5 ft. showed 25% copper, \$240 gold, over threefold higher in copper than anticipated. This ore channel is fully 35 ft. thick, proven laterally 950 ft. and no sign of an end, reaches 300 ft. vertically above No. 5 tunnel, and all in all is proving far more valuable than Manager Weir represented to the owners. As set forth in the paragraph on this property (issue of May 22d), a second ore channel, as strong as the one first exploited, is exposed. Bingham's gold-copper outlook is indeed bright.

WINNIMUCK.—A New York syndicate, represented by A. H. Borsman, has paid \$50,000 of the

price asked; total not made public. Charles W. Watson, in charge of the mine for 20 years prior to 1893, has been engaged as manager. So soon as the new pumping plant is installed sinking will be under way from the 300 level of incline. James G. Forrester, recently in charge of the Bullion-Beck mill, is to be superintendent under Mr. Watson.

TOOELE COUNTY.

(From Our Special Correspondent.)

CHLORIDE POINT.—It is now a settled fact that a cyaniding mill will be built on this ground and be operating before Thanksgiving Day. At a directors' meeting last week Messrs. W. S. McCormick, W. V. Rice and Judge J. A. Street were appointed a committee to receive bids for machinery, etc. Originally it is to be a 100-ton plant. Physical condition of the mine is excellent.

MERCUR CAMP.—There is cause for felicitations that, while prevailing conditions bear hard on Utah's mines of silver and lead, the foremost gold camp records substantial improvement. Not only have the ore uncoverings, within a few weeks, been remarkable, but at several widely separated points the grade is considerably higher than formerly. To-day, it certainly seems a conservative forecast to assert that the falling behind reasonable expectations during 1896 will more than be made up in the current 12 months. In very truth Mercur is a wonderful gold field and its area and richness are hardly begun to be appreciated.

UINTAH COUNTY.

(From Our Special Correspondent.)

VICTORIA COPPER MINING COMPANY.—A sale of the property near Vernal is advertised for June 17th, to satisfy a judgment for \$1,246, in favor of R. G. Chambers, receiver, and \$13,286 due the Commercial Bank of Milwaukee and Spencer & Macdonald, of Chicago. A second judgment of \$49,000 is also of record, held by George B. Ferry, Charles E. Crave and James L. Gates, of Milwaukee, and Edward A. Ferguson, of Chicago. Five claims compose the realty on which there was a hitch—due to adverses—in securing patents. There are favorable copper showings, several shipments made, but the lode is little tested. This prospect is 80 miles from the Union Pacific, a factor in the working expenses.

VIRGINIA.

PULASKI COUNTY.

JOHNSON & SIMPSON.—It is reported that this firm is investigating coal deposits near Pulaski, with a view of opening mines.

WASHINGTON.

CLARKE COUNTY.

WASHOUGAL MINING BUREAU.—This bureau, recently organized at Washougal, elected officers as follows: Chairman, Captain L. P. Hosford; secretary, V. J. Fike; treasurer, H. H. Carpenter. The objects of this organization will be to promote the development of the Bald Mountain mining district. A committee was appointed to open up the roadways from Washougal to that section.

STEVENS COUNTY.

DEEP CREEK MINING COMPANY.—This company has been formed by A. J. Littlejohn, of Seattle; George E. Atkinson, S. K. Geddis, M. Becker and E. W. Ouimette, to operate the Red Horse group, at the head of Deep Creek. The Red Horse has a good vein of high-grade galena, which has been developed by a 300-ft. tunnel until the property is now considered a shipper.

LITTLE GIANT.—The bottom of the shaft near Piere's Lake is all in ore and the quartz lying between the walls, which are nearly 8 ft. apart, is free milling. The Little Giant has just received a steam hoist and pumping plant and the machinery is being put in place for the summer's work, which will be pushed with vigor.

WEST VIRGINIA.

MINE INSPECTION DISTRICTS.—In compliance with the provisions of the new mine law, passed by the last Legislature, and which took effect May 18th, Governor Atkinson and Chief Mine Inspector J. W. Paul have divided the State into four mining districts, to be composed of the following-named counties, respectively:

First District—Barbour, Berkeley, Brooke, Doddridge, Grant, Hardy, Hampshire, Harrison, Hancock, Jefferson, Lewis, Marshall, Marion, Mineral, Monongalia, Morgan, Ohio, Preston, Pendleton, Randolph, Taylor, Tucker, Tyler, Upshur and Wetzel.

Second District—Braxton, Calhoun, Cabell, Clay, Gilmer, Jackson, Mason, Pleasants, Putnam, Ritchie, Roane, Wayne, Wirt, Wood and all that part of Kanawha County on both sides of the Kanawha River west of Coalburg, including the mines in the Cabin Creek Valley and all other mines within one mile east of Coalburg.

Third District—Fayette, Greenbrier, Monroe, Nicholas, Pocahontas, Raleigh, Summers, Webster and all that part of Kanawha County on both sides of the Kanawha River east of Coalburg, but not including any mine within one mile of Coalburg.

Fourth District—Boone, Lincoln, Logan, McDowell, Mercer, Mingo and Wyoming.

The chief mine inspector has assigned the following mine inspectors to preside over the several districts as follows: S. A. Lewis, first district; Jerry

Meade, second district; John I. Absalom, third district, and W. J. Preece, fourth district.

BERKELEY COUNTY.

LIMESTONE QUARRIES.—The quarries near Martinsburg are producing 26 carloads of limestone a day; and orders now on hand will increase the output to 35 carloads. Several hundred men are employed. The stone is 99% pure lime and is found only in the deposit now being worked, which is about 100 ft. in width. The owners contemplate opening another pit, the three now working being insufficient to supply the demand.

KANAWHA COUNTY.

LEATHERWOOD COAL AND LUMBER COMPANY.—This company, with a capital of \$100,000, has been chartered at Clendennin by Harry S. Jenkins and others to develop coal and lumber lands.

WYOMING.

ALBANY COUNTY.

ESTABROOK MINING AND MILLING COMPANY.—This company was organized at Douglas recently to develop the Cooper galena prospect near Laramie peak.

CARBON COUNTY.

GOLD COIN MINING COMPANY.—The Emma G. claim, operated by this company, has done a large amount of work near the top of Cooper Hill. Some 200 ft. of tunnels and about 80 ft. of inclines have been driven, which show a large body of free milling ore which it is said will run about \$10 per ton. This is the original discovery. The properties are located near the south end of the hill.

OVERLAND GOLD MINING COMPANY.—This company owns about 11,000 acres of ground near Rockdale and has already established a plant for a partial development of the claims and will, within a few weeks, erect an additional and much larger plant. The manager, general director and largest stock owner in this company is Mr. Chas. S. Cryler. The company began operations in January of the present year, since which time it has constructed three miles of ditch leading from Foote Creek and Wagon Hound Creek, has erected a dozen frame buildings, laid a 15-in. steel pipe line 2,800 ft. in length, a lumber flume 800 ft. long, fitted with Lambing iron rifles for 25 ft., and with block and bar rifles for the remaining distance. This pipe has a capacity of 15 cu. ft. per second and a fall of nearly 200 ft., giving a pressure of slightly under 100 lbs. per square inch at the nozzle of the giant. The bedrock on this property runs from 4 to 9 ft., the gold being widely dispersed and of a granular nature.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

RAINY LAKE DISTRICT.

ANGLO-ONTARIO EXPLORATION AND GOLD MINING COMPANY, LIMITED.—This company has been organized under the laws of Ontario with a capital stock of \$1,000,000. The officers of the company are Rod A. Demme, of Detroit, Mich., president; J. C. Foley, of Ypsilanti, Mich., vice-president and general manager; Hans Ruteshouser, of Detroit, Mich., secretary and treasurer; John J. McAuliffe, of Duluth, assistant secretary; Ellis & Ellis, of Windsor, Ont., solicitors; Canadian Bank of Commerce, of Windsor, bankers. The first board of directors is composed of Rod A. Demme, president of the Foley Gold Mines Company; Arthur St. George Ellis, of Windsor, Ont.; Thomas J. Hurley, New York; J. C. Foley, of the Foley mine; Samuel S. Babcock, of Detroit, Mich. The head office of the company will be at Windsor, Ont., with branch offices in Detroit, Mich., and at Duluth. The capital stock is divided into 1,000,000 shares of \$1 each, of which one-half will be left in the treasury to provide working capital. The new company owns 35 properties, located during the past two years in the Manitou, Little Turtle, Shoal Lake and Sturgeon Falls districts. Several of the locations are in the Sawbill District, and have a number of gold-bearing veins ranging in width from 2 to 6 ft. They also include an extension of the Hammond vein which is over 25 ft. in width.

SLOCAN DISTRICT.

ONTARIO.—This mine, adjoining the Mannamead on the North Fork of the Salmon, has been sold by the owners, Forge Adie, of Waneta; R. W. Craig, Joseph Campbell and William Berwick, of North Fork, for \$15,000 cash to parties in Victoria.

SUNLIGHT FRACTION.—Messrs. White & Sibbald report the sale of this fraction, the consideration being \$1,000. The claim adjoins the Republic group, about 3½ miles up Springer Creek. The owner was W. L. Pannell, of Slocan City.

(From Our Special Correspondent.)

HALL MINES SMELTER.—The refinery furnace of this smelter is now working very successfully. One product shows 75% of copper. This will be heated again in order to obtain a finer grade. It is to be shipped East for final treatment. The new 200-ton blast furnace is almost completed and will soon be ready for custom work.

PILOT KNOB.—This group will soon be added to

the shipping list. A new wagon road is being built from the claim to the Silver King road, a distance of a mile and a half.

TWO FRIENDS MINING COMPANY.—This company, which for some time past has been working the Two Friends claim on a bond, has stopped all work upon it. The company owns an undivided one-quarter interest in the property, and will allow all other interests in the property under the bond to lapse. It will now give its attention to the Great Western, which is fairly well developed.

TRAIL CREEK DISTRICT.

WAR EAGLE GOLD MINING COMPANY.—The sale of this property having been effected, the report submitted at the meeting on May 17th gave a financial statement of the company's affairs from the beginning of operations December 3d, 1894, to May 1st, 1897. This gave the total amount of ore shipped as 20,757 tons, for which \$501,151 was received. The sale of the property yielded \$700,000, which, with a few minor cash receipts, gave a total of \$1,201,737. Under disbursements the operating expenses were \$262,046; dividends on ore sales, \$217,320; dividends from sale of the property, \$693,769; Iron Mask loan, \$13,900, leaving total cash in treasurer's hands \$14,691. The unfinished business of the company is the note of the Iron Mask Gold Mining Company for \$13,900, collectable at any time; six lots in Rossland, estimated value \$3,000; water right on Pend d'Oreille River; estimated value \$200.

(From Our Special Correspondent.)

BLACK BEAR.—Some rich specimens of gold bearing quartz have been taken from the tunnel on this property, and it is claimed that assays of it have reached as high as \$2,800 per ton. The mine is on the southwest face of Red Mountain, and adjoins the Le Roi, to which company it belongs. The tunnel is in 260 ft., but it is intended to be run in a distance of 750 ft. on the vein where it will connect with the west drift of Le Roi. The quartz vein from which the assays were taken is said to be 2 ft. wide.

EVENING STAR.—This company has applied for permission to increase its capital stock from \$1,000,000 to \$1,500,000. The present liabilities of the company are said to reach \$5,500.

JUMBO.—At the annual meeting of this company, recently held in Spokane, Jno. B. Finch was elected president, M. A. Gelusha vice-president, and H. K. Galusha secretary. This company has now seriously set to work developing the mine by sinking. A large amount of tunneling has been done; the figures are given at 1,000 ft. The lower tunnel is in 350 ft. Depth is believed to be needed in order to get pay ore. Heretofore the greatest work has been done in the tunnel, where there are large bodies of pyrrhotite. The negotiations for the sale of the property do not appear to have been successful. The management in consequence has decided to develop the mine below these bodies of pyrrhotite.

LE ROI MINING COMPANY.—This company has not yet selected its site for a smelter, but it is understood that the determination to build one has been fully made. Colonel Peyton and Mr. James Breen, it is reported, will shortly leave for the East to purchase the necessary machinery, a site in the meantime having been pretty fully examined and partly decided upon.

ORE SHIPMENT FROM KOOTENAY.—The quantity of ore shipped from Slocan via Kaslo and Nakusp from January 1st of the present year to May 15th amounted to 13,360 tons; from Rossland via Northport, 6,531½ tons, being a total in round numbers for the period named of 19,910 tons. This does not include the ore produced and milled at the O. K. mine, which will bring up the total to 22,000 tons.

The value of the ore shipped through the Nelson Custom House was \$1,178,781.95; via Revelstoke and Nakusp, \$292,110.65, being a total of \$1,470,892.60. The average value of this is given at \$73.88 per ton. The production of the Nelson and Trail Creek smelters for the same period is given at 3,385½ tons, the Hall mine matte having been 582 tons; Trail Creek matte, 2,803½ tons. The value of this matte is given at \$1,504,336.78, which added to the value of the ore gives a total of \$2,975,229.38 exclusive of the O. K. milling ore, which added will increase the output to a trifle above \$3,000,000. These figures do not include the Boundary District.

PROPOSED RAILROAD CONSOLIDATION.—The reported consolidation of the Nelson & Fort Sheppard, the Spokane Falls & Northern and the Red Mountain railways, which are now separate corporations, will, it is said, facilitate the immediate construction of the proposed extension from Northport up Sheep Creek, thence into Kettle River Valley at the south end of Christena Lake and westward to Grand Forks, B. C. This is said to be the stated route to the Boundary Creek District. It is further reported that New York capital will be enlisted in this enterprise.

ROYAL FIVE GOLD MINING COMPANY.—This company has added another claim to its property in Burnt Pass. They have now six claims. They recently let a contract to sink 50 ft. on the Royal Oak, which is one of the properties included in this group.

SILVER BELL.—Development work has made considerable progress on this property since last winter. There is now a commodious shaft house in which is

a 15-H. P. boiler and a hoisting engine. The shaft is now down about 90 ft., and it is the intention to crosscut from this shaft to the 125-ft. level. The work is now down on a body of limestone rock with quartz streaks which are more or less mineralized. This shaft has been sunk on the upper showing, and assays from the highly decomposed ore at the surface gave values from \$61 to \$104 in gold, silver and lead. The plant is working well. Ten men are employed in development and other work in and about the mine. The situation of the property is on the southwest face of Deer Park Mountain, within easy distance of the Spokane & Northern Railway, where a way station has already been placed. The property is being developed in accordance with a systematic plan which has been carefully prepared by an experienced mining engineer.

The officers of the company are: G. H. Pounder, Rossland, president; M. O. Tibbits, Toronto, secretary and treasurer. The directors are the two named, with W. J. Green, Toronto, J. A. Pounder, Rossland, and J. J. Hennigar, Rossland.

SOUTH BELT.—A majority of the properties are not being worked, though, it is said, work will soon commence on the Lily May. This property comprises an area of 13.57 acres. The title has been crown granted. The headquarters of the company are in Spokane, Wash. The capital stock is \$1,000,000 in \$1 shares. The claim was located in 1889. According to Mr. Carlyle, provincial mineralogist, a tunnel was started on the vein, on ore which gave fair assays in silver, gold and lead, silver taking the lead. The tunnel has since been extended to a considerable distance with varying success. In one part the ore gave out, but a winze was sunk and the ore, consisting of quartz, gangue and pyrites, though of low grade, was again found. Two additional shafts have been sunk on a second lead and altogether a considerable amount of development work has been done. Machinery is now on the ground to prosecute development in a vigorous and systematic way, and it is stated by those in charge of the mine that work will shortly begin.

WHITE BEAR.—The strike recently made in this mine was in the crosscut at the 100-ft. level of the shaft, 70 ft. west from the same. The ore shows considerable copper and much pyrrhotite, but it is a decided improvement on the ore first encountered in the shaft. The ore body is 13 ft. wide and the lead runs for a distance of 500 ft. within the White Bear lines.

YALE DISTRICT.

Messrs. F. L. Fitch, Thomas Allan and Stephen Grisby, of Ainsworth, recently made a strike in prospecting along the Fraser River near its junction with the Salmon. It is a strong ledge, which can be easily traced for a considerable distance. The ledge carries free milling gold rock, from which assays ranging from \$2 to \$70 were secured.

COLOMBIA.

(From Our Special Correspondent.)

DARIEN GOLD MINING COMPANY, LIMITED.—The returns for April were 580 tons of ore crushed for a yield of 841 oz. gold. The milling rock is taken entirely from the 100-ft. stope, below the adit level. The old Spanish workings extend below that level so that the virgin lode has not yet been seen. The engine shaft is down 332 ft. from the surface. The 180-ft. crosscut from this shaft will cut the lode next month (June) in what there is every reason to believe will be virgin ground. On completion of the sinking operations it was found necessary to retimber the shaft from surface to adit level, hence the delay in the opening up of the lode at the lower level.

The 20-stamp mill has been entirely overhauled, and new mortar blocks and frames put in. Cement concrete has been used to a great extent in the mortar blocks. Up to the present only 10 stamps have been running, the presence of the old workings having rendered the extraction of the ore very difficult and even dangerous at times. A cyanide expert is now experimenting with the tailings and it is expected that a cyanide plant will shortly be erected. The ore is on the whole free milling, but at times contains very rich sulphurets.

A ditch 6 miles long has just been completed to bring on the Seteganti River. This now runs the compressed air plant, which does all the pumping and runs a couple of rock drills in the crosscut. A machine shop containing 10-in. and 6-in. screw cutting lathes, boring and screwing machines is run by a separate Pelton motor.

A hydraulic pumping plant is now being installed. Two motors are to be placed at the adit level, working together or independently under a head of 330 ft. They are connected directly to a pair of cranks, which transmit the power down the shaft by hollow steel rods to a couple of Rittinger telescopic plunger pumps, the whole forming a perfectly balanced system. The motors and cranks are set on cement masonry foundations. All bed-plates, cranks, connecting rods, etc., are made of riveted steel plates and angles, and all castings are of gun metal. The hollow plungers are 15 in. and 9 in. diameter, with 6 ft. 6 in. stroke. The whole plant has been constructed and designed for transport over mountainous roads by Messrs. Heenan & Froude, Manchester, England. A new saw mill, operated by a turbine, has been put up about two miles from Cana, and a macadam road laid down to connect the mill with the mine.

An engineer and staff have surveyed and laid out a route for a wagon road from the mines to the nearest river port, distant about 25 miles. Work has already commenced on this road, which will eventually be ballasted and made available for wagon traffic at all seasons; the maximum grade is 10%. The company has a specially constructed steamer running between Panama and the river port, which journey is accomplished in 22 hours.

MEXICO.

SONORA.

(From Our Special Correspondent.)

WEST SANTA ROSALIA GOLD MINING COMPANY.—This company has been incorporated for the purpose of working the extension of the Santa Rosalia mine, which is located about eight miles from the old town of Arizpe, in the Arizpe District, and other mines in the same locality. The directors are: Charles R. Bishop, J. L. Rathbone, Geo. F. Beveridge, Charles F. Gardner and W. H. Bailey.

ONTARIO.

MARMORA DISTRICT.

(From an Occasional Correspondent.)

The interest in mining development in this district seems to be on the increase. The Deloro mine is being vigorously pushed, and it is claimed the bromo-cyanide treatment is giving good results in the extraction of the gold from the mispickel ore, as did also chlorination. Mr. Hugh Picard has charge of the extraction and laboratory work. The company has bonded very extensive areas in the neighborhood, besides those which it already controls. Further north, at Bannockburn, the Eastern Syndicate of Toronto has purchased the Bannockburn mine for \$15,000 and has entered into possession. The vein is not a large one; it occurs in what is termed by the Geological Survey mica slates. An old 10-stamp mill has been reconstructed in connection with this mine, but is not operating at present. Mr. McNaughten is superintending the operations of this company, and has one shaft down 70 ft. some seven miles to the north of Bannockburn. Prospecting is being carried on to a considerable extent at the Craig mine, under the general supervision of Mr. W. Hamilton Merritt, mining engineer. At this place one shaft is nearly 100 ft. down, another 30 ft. and a third some 15 ft. Test pits are also being made on the vein, and mill-runs of the product are treated in a Tremain steam two-stamp mill. The vein is from 5 to 8 ft. thick in the main shaft, and it occurs in an intrusive diorite which shows considerable alteration.

While ore in the vicinity of Marmora seems to be entirely refractory, most of the veins so far developed in the Bannockburn region seem to be free-milling and do not carry many sulphurets.

PETERBOROUGH COUNTY.

Development work has been commenced on the lithograph stone quarry at Burleigh, owned by Messrs W. H. Casement and R. H. Strickland, Lakefield, and several Peterborough gentlemen.

SPAIN.

For the two months ending February 29th the imports of coal were 413,340 metric tons and of coke 79,300 tons. Iron and steel imports included 437 tons pig iron; 4,371 tons wrought iron; 6,933 tons steel; 163 tons tin-plates. Exports of minerals for the two months were, in metric tons:

	1896.	1897.
Iron ore.....	1,543,967	1,892,283
Copper ore.....	141,001	170,365
Zinc ore.....	7,947	9,316
Lead ore.....	2,218	1,364
Salt.....	71,492	57,963

Exports of metals included 11,079 tons pig iron, 9,706 tons copper and 42,683 tons lead.

TASMANIA.

MOUNT LYELL MINING COMPANY.—This company states that during the four weeks ending May 6th, a total quantity of 4,494 tons of ore was treated, assaying copper, 4.27% silver, 3.59 oz.; gold, 0.257 oz. per ton; also 40 tons rich ore, assaying copper 10% silver, 303 oz.; gold, 2 oz. per ton. There were produced 341 tons of converter matte, containing silver, 29,263 oz.; copper, 193 tons; gold, 1,168 oz. Furnace No. 1, 26½ days; furnace No. 2, only 21½ days, owing to a slight interruption. Up to May 6th, there have been shipped 1,014 tons blister copper. Advances have also been received to the effect that the net profit for the half-year ending March 31st last is £51,660, and the balance to the credit of the profit and loss account at the same date is £83,564. This balance having been absorbed in expenditure on capital account, for the erection of the company's works and plant, the board of directors have resolved to refund the revenue account, by making a further issue of 28,900 shares, which will increase the total number of shares in issue to 250,000, representing a nominal issued capital value of £750,000.

WESTERN AUSTRALIA.

The entries of gold for export from this colony for the four months ending April 30th amounted to 152,862 oz., which compares with 62,129 oz. last year. The West Australian Chamber of Mines reports that returns from a number of working mines show for the four months a total of 51,747 tons of ore worked, yielding 116,119 oz. gold, or an average of 2.5 oz. per ton.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 4.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending May 28th, 1897, compared with the corresponding period last year:

	1897.		1896.
	Week.	Year.	Year.
Pennsylvania Railroad.....	60,502	1,374,256	1,474,819

PRODUCTION OF BITUMINOUS COAL in tons of 2,000 lbs. for week ending May 28th, and for years from January 1st, 1897 and 1893:

	1897.		1896.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	37,080	914,149	956,088
Barclay, Pa.....	5,731	20,979	.....
Beech Creek, Pa.....	85,482	1,517,079	1,331,663
Broad Top, Pa.....	9,764	143,539	.....
Clearfield, Pa.....	74,729	1,849,937	1,934,895
Cumberland, Md.....	175,706	1,381,472	1,161,737
Kanawha, W. Va.....	169,079	1,374,815	1,361,494
Phila. & Erie.....	4,623	154,583	24,771
Pocahontas Flat Top.....	168,979	943,176	.....
Totals.....	431,183	8,329,759	6,710,598

	1897.		1896.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	33,236	539,952	408,092
Pittsburg, Pa.....	31,483	697,458	768,549
Westmoreland, Pa.....	30,257	754,282	839,319
Totals.....	94,976	1,991,692	2,015,960

Grand totals..... 526,159 10,321,451 8,726,558

Production of coke on line of Pennsylvania Railroad for the week ending May 28th, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 85,116 tons; year, 1,787,701; to corresponding date in 1896, 1,905,402 tons.

† For week ending May 22d. † For week ending May 21st.

Anthracite.

The hard coal trade continues firm, but is not materially changed in amount since last week. Some of the companies report a slightly increased volume of business, others say they are doing less than last week. The average of the opinions warrants the conclusion that buyers, being practically assured of a continuation of existing prices for another month, are not in a hurry to place their orders. That they intend doing so before long, however, is shown by the number of inquiries that are coming in. This is especially true of the New England trade, where the difficulty in the way of sales is not so much the price asked for the coal as the ocean freight rates asked to carry it to its destination. As these rates have dropped 5@10c. per ton within the last few days, this obstacle has been partially removed, which should result in better shipments to New England ports.

The continuation of the 2,500,000-ton basis for June shipments is not satisfactory to all of the interests, though it is not causing the slightest dissatisfaction as a business policy. Earlier in the year there was every reason to believe that the tonnage for June would be 3,000,000, and quite likely 3,500,000 tons, and contracts were made accordingly. Now, however, since the small steam sizes have had so ready a sale they are extremely scarce, and those companies who contracted for their delivery in June in expectation of a total tonnage greatly in excess of what has been decided on, find themselves unable to supply them conveniently. To obtain the required amount of small sizes a larger tonnage of other sizes must result, but where these are produced in excess now they will be curtailed next month.

NOTES OF THE WEEK.

The Schuylkill Coal Exchange gives notice that the Philadelphia & Reading collieries drawn to return prices of coal sold in May, 1897, to determine the rate of wages to be paid, show an average price of \$2.51, and the rate of wages to be paid for the last half of May and the first half of June, 1897, is the \$2.50 basis.

The statement of the Lehigh Valley Coal Company for April shows, as compared with April, 1896, a decrease in gross earnings of \$158,034, a decrease in expenses of \$220,877, and an increase in net earnings of \$62,842. For the five months of the current fiscal year, from December 1st to April 30th, the company reports an increase of \$273,537 in net earnings.

Bituminous.

The Atlantic seaboard soft coal trade appears to be in a dull condition, though it is thought that the tonnages going forward, and that have gone forward this year, are about up to last year's shipments; possibly the last month's shipments would show, by comparison, some slight falling off. Orders seem to be difficult to get by the operators, not only for future shipment, but for present shipment on the contracts already held in hand. There is a rumor of a New York Central contract coming into the market; it is not thought that any higher prices will be procured on it, as the market now is about as demoralized as at any time this year con-

cerning prices. It is believed in some circles that if the bids on this contract show any break in prices, or even possibly a continuance of the demoralization of the earlier part of this season, it will clinch the ideas of the main line roads regarding the cutters of prices in the market, and bring about some strong action early next year.

Trade in the far East is sluggish and consumers are disinclined to take coal there at present. In the Sound trade consumers are taking a fair amount of coal, being inclined to do so to some extent by the falling ocean freight market. Of New York harbor trade there is little to be said; it is quiet, the regular trade coming in on slightly delayed time for prompt shipment.

All-rail trade is fairly regular as to tonnage, though there seems to be a continuation of the efforts to reduce the low prices already made in this trade. Transportation from mines to tide is fairly good, and we hear of no complaint from the regular shippers. Car supply is regulated to a great extent, as it has been for some weeks past, by the promptness in disposing of loaded cars at tide-water on their arrival there.

In the coastwise vessel market there is a full supply of the very large and very small class of vessels at the lower ports, though the medium sized ones are not quite up to the demand. Freight rates are somewhat lower, the larger class of vessels making the lower rate to get charters. We hear of a few charters having been made at 50c. to Boston and the Sound, though we quote the prevailing rates as follows: From Philadelphia to Boston, Salem and Portland, 55@60c.; Providence, New Bedford and Sound ports, 55c.; Portsmouth, 55@60c.; Wareham, 75c.; Lynn, 70@80c.; Newburyport, 75c.; Dover, 90c. and towage; Saco, 85c. and towage; Bath, 60c.; Gardner, 60c. and towage; Bangor, 60@65c. Five and 10c. above these rates are asked from Baltimore, Norfolk and Newport News.

Buffalo.

June 3.

(From Our Special Correspondent.)

The situation of the anthracite coal market is the same as a week ago; business light at nominally unchanged quotations. The movement by lake is small at very low rates of freight, with no prospects of improvement in either.

The bituminous coal trade is fairly active, as manufacturers are comparatively busy. The schedule of prices is unchanged, but the buyer still has the advantage when deals are made, as stocks are large and merchants are anxious to save railroad demurrage charges.

Items of news are scarce, as there is nothing strong in the situation demanding comment.

The shipments of coal westward by lake from Buffalo for the week ending May 30th, aggregated 44,715 net tons, distributed as follows: 32,915 tons to Chicago, 1,900 tons to Milwaukee, 3,700 tons to Duluth, 5,000 tons to Superior, 600 tons to Racine and 600 tons to Kenosha. The rates of freight were 20c. to Chicago, Milwaukee, Duluth and Superior and 25c. to Kenosha and Racine.

The shipments of coal by lake from Buffalo since the opening of navigation to June 1st aggregate about 135,000 net tons this year, as compared with 270,000 net tons in 1896.

At least one-half of the vessels clearing from Buffalo leave light, calling at Ohio ports for bituminous coal cargoes, which are occasionally obtainable. Owners complain of the great dullness that prevails in the movement of up freight.

Pittsburg coal operators complain of the lack of business, and say that it is useless for the miners to talk of an advance in rates, as there is no work for them at present prices even. One operator says that he reduced his men to 54c., hoping they would strike, but they accepted the reduction, and now he has no market for the coal.

Chicago.

June 2.

(From Our Special Correspondent.)

Anthracite Coal.—Chicago has been experiencing during the past few weeks a period of cold weather that has beaten all records for chilliness, according to the Weather Bureau. In consequence, there has been a continued consumption of hard coal for heating purposes, and the dealers have had quite an unexpected run of small business. Furnace fires have been continued right up to the present time, which is from two to three weeks beyond the usual season for discontinuing. Out-of-town trade has been much better than expected, and the orders were for larger amounts. Inquiry has been large enough to warrant a continuance of the present run of orders, though the first warm weather may stop trade. Dealers do not look for any great increase in business for some time to come, in fact not until the summer is over. With better commercial conditions the consumption of coal will increase, and therefore good times are looked for with anxiety by even the coal dealer.

Bituminous Coal.—The market has quieted down and but few contracts have been booked during the week. There continues to be a spirited bidding on contracts now in the market and all kinds of prices are offered to obtain the business. It is hard to see where there is any profit on some contracts booked lately, but it is presumed that the average coal dealer is working for profit and not for love. Demoralization would about express the condition of the soft-coal trade hereabouts.

Pittsburg.

June 3.

(From Our Special Correspondent.)

Coal.—Business is very unsettled. There seems to be no real price for mining. Many of the miners at various points are making the best terms possible and going to work; others again are disposed to stand out for higher prices. The lake trade is unusually dull, and shipments generally this spring are lighter. Colonel Rend states that the coal trade is very dull, and that the outlook for the future is not very bright. Such being the case, a general strike could only be followed by the closing of all the mines and a complete suspension of operations. The miners' officials are getting things in shape for a strike in the Pittsburg field. It is not probable that a general strike will be declared, but that Pittsburg mines will suspend is almost a certainty, as Pittsburg has always been the basis upon which the scales in other districts have been fixed.

Connellsville Coke.—A big slump has again occurred in the coke trade, with poor prospects for improvement. The active list is nearly down to one-half the ovens in the region and many of the plants are running but half time. One of the strongest elements contributing to a light coke trade is the shutting down of the furnaces in the Mahoning and Shenango Valleys. The price of coke has now fallen to \$1.20 per ton and it is thought another drop will soon take place. An appeal has been made to the railroads for a reduction in rates and a slight improvement may take place during the present month. At the price coke is supposed to be selling it looks serious for the operators and very trying to those who depend upon the region for a living. Considering the lay-off days and the short runs at many places, the men employed in the region are averaging very little more than half time. Summary for the week shows 10,238 ovens in blast, with 8,139 idle. There were 272 ovens blown out during the week and unless things look better in the next few days further additions to the idle list will be made. Shipments: To Pittsburg, 2,574 cars; shipped west, 2,289 cars; shipped east, 1,185 cars; total, 6,048 cars.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 4, 1897.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From Jan., '96.		From Jan., '97.	
	June 5, 1896.	June 4, 1897.	Tons.	F'ces.	Tons.	F'ces.
Anthracite.	42	21,910	26	15,690	613,148	396,486
Coke.	138	172,480	108	151,500	3,839,279	3,223,311
Charcoal.	15	5,230	14	3,853	116,990	116,136
Totals	195	199,620	148	170,950	4,569,517	3,737,936

Some signs of improvement in the iron market can be noted here and there. Chief among these is the fact that there has been some large buying of raw material in a quiet way, some consumers having apparently concluded to take advantage of low prices and contract for future supplies. Of course there is the drawback that large orders taken now for future deliveries will prolong the period of bottom prices, but makers are apparently prepared to accept this, provided they can sell their product. In finished material some improvement is shown in sales, especially in structural material.

The weak point in the outlook for the future is found in the probability of labor troubles which may follow the reduction in wages which is now going on everywhere. Manufacturers claim that this is necessary to meet the low prices, and that under present conditions it is a case of lower wages or none at all. In some cases the reductions have been accepted, but in others there is trouble. At the great works of Jones & Laughlins in Pittsburg 2,500 men are out, and strikes have occurred at Reading, Pa., and elsewhere.

The Amalgamated Association of Iron and Steel Workers closed its convention at Detroit last Saturday. The wages scale adopted has not yet been presented to the manufacturers, but it is understood that the rate for boiling and puddling remains unchanged, \$4.50 per ton when bar iron sells at 1'3c. or below, \$4.75 with bar at 1'4c., and \$5 when the price is 1'5c. Some advances will be asked on the sheet and tin-plate scales, which the manufacturers will hardly be willing to grant.

An important move is noted from Alabama, where dispatches state that the Solvay Process Company has concluded a contract with the Tennessee Coal, Iron and Railroad Company, under which a large plant of Semet-Solvay by-product coke ovens will be put up at Ensley. The Solvay Company, it is understood, will run the ovens, buying the coal from the Tennessee Company's mines and selling the coke to that company. The plant will be an object lesson to the Alabama operators which ought to be of great value.

NOTES OF THE WEEK.

The Amalgamated Association of Iron and Steel Workers at its Detroit meeting elected the following officers: M. M. Garland, Pittsburg, president; Stephen Madden, Pittsburg, secretary; John Williams, Carnegie, assistant secretary; John Pierce, Pittsburg; Daniel Mullane, Youngstown, O., and Theodore Shaffer, Pittsburg, trustees. The vice-presidents were elected by districts as follows:

William Collier, Pittsburg; David Llewellyn, Martins Ferry; M. D. Cooke, Cincinnati; J. D. Hickey, Milwaukee; Samuel Cashmore, Muncie, Ind.; John T. Ward, Youngstown; J. Mason, Birmingham, Ala. The convention next year will be held in Cincinnati.

Beginning on May 27th the rates of freight on pig iron, billets and articles taking same rates from Pittsburg, Pa., and from points taking Pittsburg rates, are as follows: On pig iron, in carloads of 12 gross tons and over, to Detroit, Junction Yards and West Detroit, Mich., \$1.55 per gross ton; to Bay City, South Bay City, West Bay City and Saginaw, Mich., \$2 per gross ton. On billets, blooms, ingots, muck or puddle bars and slabs in carloads of 12 gross tons and over, to Detroit, Junction Yards and West Detroit, Mich., \$1.60 per gross ton; to Bay City, South Bay City, West Bay City and Saginaw, Mich., \$2.30 per gross ton.

The American Pig Iron Storage Warrant Company reports the following for the five months ending May 31st:

Five months.....	Rec'd. tons.	Deliv'd. tons.	In yards. June 1.
1897.....	40,000	17,000	223,000
1896.....	8,100	4,500	109,800
1895.....	17,700	4,800	124,100

For May, 1897, the receipts of pig iron amounted to 10,100 long tons, and the deliveries to 4,000 tons. Sales of warrants on the New York Metal Exchange during the month were 300 tons for spot delivery, at \$6.25; 300 tons for June, at \$6.30; 300 tons for July, at \$6.32½; 300 tons for August, at \$6.35; 1,500 tons for September, at \$6.25@6.45; and 400 tons for November, at \$6.35, making a total of 3,100 tons, against 8,200 tons in April, which were sold at \$6.32½@6.50.

New York.

June 4.

The local iron market has been quiet this week and but few contracts have been taken. Sales agents also complain of slow collections on the orders that were filled early in the year. The present low prices apparently do not act as an incentive for heavy purchases by the large local consumers. Those who are in need of iron and steel canvass the trade and thus get extremely low prices. In structural material there was a contract let for the new sugar refinery in Brooklyn, which amounted to 2,000 tons. The iron work for the Athenaeum building of the Central Young Men's Christian Association will be supplied by the West Side Foundry Company, which received the contract at \$2,498. In cast-iron pipe a contract will be let on June 21st for furnishing and laying about 11,000 ft. of 36-in. water pipe at Binghamton, N. Y.

In export trade we understand Japan has been inquiring for extensive quantities of track material upon which some of our mills have bid. On June 3d one of the concerns placed orders for about \$19,000 worth of machinery, chiefly electrical. Railway supplies were also purchased for Tokio amounting to about \$8,000. Six locomotives will be built by the Baldwin Locomotive Works for the Cape Government Railways of South Africa. The South American States are purchasing some machinery. Manufacturers report that they are making more money from the export business than from home consumers, and are therefore pushing energetically in that direction.

Pig Iron.—Local sales agents report business as small, with only an occasional fairly large order. The Tennessee Coal, Iron and Railroad Company reports trade as somewhat better, especially as regards export. Recently it sold a quantity of pig iron to the China & Japan Trading Company, besides booking orders for Europe and Australia. The Sloss Iron and Steel Company has made large sales of pig iron abroad. This company has only one furnace in blast now, but it has others which can be blown in at short notice.

There have been no changes in the quotations below, but they can probably be shaded by a large consumer: Northern No. 1 X foundry, \$12@12.50; No. 2 X foundry, \$11@11.25; No. 2 plain, \$10.50@11; gray forge, \$9.75@10.25; Southern No. 1, \$10.25@10.75; No. 2, \$9.75@10; No. 1 soft, \$9.75@10; No. 2 soft, \$9.75@10; gray forge, \$9.25@9.50; basic, \$10.25@10.50. All prices are for tidewater delivery.

Cast-Iron Pipe.—There are no large contracts to be closed within the next few days. A private order of about 1,000 tons was taken this week. Manufacturers report business better this year than it was last, but prices much lower.

Spiegeleisen and Ferro-Manganese.—The trade locally continues quiet. Prices are: For spiegeleisen, 20%, \$19@19.50 per ton; ferro-manganese, 80% domestic, \$45, delivered at buyer's mill.

Steel Billets.—Business locally continues quiet, and mill prices stand at about \$15.50@16.

Merchant Iron and Steel.—The trade continues quiet. Prices are weak. Common bars, 1@1'05c.; refined, 1'10@1'25c.; soft steel bars, 1'05@1'10c. Other quotations are: Steel hoops, 1'35@1'40c.; base; steel axles, 1'55@1'60c.; links and pins, 1'50@1'60c.; light cotton ties, 50c. per bdl. at mill. All prices are for delivery on dock New York, and are for large quantities.

Plates.—Business is quiet. We quote for universal mill plates 1'15@1'20c. For steel plates prices are: Tank, 1'10@1'15c.; boiler shell, 1'20@1'30c.;

flange, 1'25@1'40c.; firebox, 1'60@1'75c., and 2'25@2'50c. for locomotive firebox, according to quality. Charcoal iron plates are 2'25c. for shell, 2'75 for best flange and 3'25 for firebox. Rivets are 3@3'25c. for iron and 1'75@1'85c. for steel. Prices are for tidewater delivery in large quantities.

Structural Iron and Steel.—Several contracts have been closed this week. We quote for angles, 1'10@1'15c.; tees, 1'35@1'50c.; channels, 1'70@1'80c. The price of beams, New York delivery, is 1'25@1'30c. for ordinary sizes, 1'45c. for 20-in., and 1'50c. for 24-in., carload lots.

Steel Rails and Rail Fastenings.—Business is not active, and prices are unchanged. We quote: Standard section steel rails, \$18@20 at mill, and girder rails \$23.

Quotations for rail fastenings are: Angle bars, 1'05@1'10c.; spikes, 1'50@1'60c.; bolts, 1'75@1'85c. for square nuts and 1'80@1'85c. for hexagon nuts. These prices are for carload lots.

Wrought-Iron Pipe.—Business continues fair, and discounts are as follows: For plain pipe, out of store: 1½ in. and over, 67, 10, 10, 10 and 10%; 1¼ in. and under, 50, 10, 10, 10 and 10%. Galvanized pipe, 1½ in. and over, 55, 10, 10, 10 and 10%; 1¼ in. and under, 50, 10, 10, 10 and 10%. For fair-sized orders these discounts are made with an additional 5% for less than carload lots. For carload lots this additional discount is 7½% to 10%.

Nails.—Business in wire nails is good, and New York prices continue at \$1.55@1.60, while at mill they are \$1.35@1.40. In cut nails trade has also been better, and \$1.25@1.30 base is quoted for carload lots at mill.

Old Material.—Business has been fair in volume, both for home consumption and for export, and prices about as follows: Old iron tee rails, \$10.50@12 per ton; old steel rails, \$10@11; No. 1 wrought scrap iron, \$11.50@12.50; good machinery scrap, \$9@10, all f. o. b. cars; wrought pipe and tubes, \$7.50@8 per ton; car wheels, delivered at buyer's works, \$10@10.50; burnt iron, \$5@5.75; cast borings, \$7@7.50 per ton delivered at mill.

Buffalo.

June 2.

(Special Report of Rogers, Brown & Co.)

There are those who believe that the outlook is brighter and that a turn in the tide, although almost imperceptible, has surely taken place. It would be hard to confirm this by either the quantity of business or the prices which are ruling. It, however, can at least be positively asserted that there has been no backward movement of any sort during the past week. Prices remain unchanged and are nominally as quoted below, f. o. b. cars Buffalo on the cash basis: No. 1 strong foundry coke iron, Lake Superior ore, \$10.75; No. 2 strong foundry coke iron, Lake Superior ore, \$10.50; Ohio strong softener No. 1, \$10.75; Ohio strong softener No. 2, \$10.50; Jackson County silvery No. 1, \$14; Southern soft No. 1, \$10.75; Southern soft No. 2, \$10.50; Niagara malleable, \$11.

Chicago.

June 2.

(From Our Special Correspondent.)

Pig Iron.—The amount of business transacted in pig iron during the past week was about equal to the preceding week. There was a good run of small orders, while several fair-sized contracts were booked, one sale of 3,000 tons having been the largest. The Northern furnaces managed to obtain the greater part of the week's tonnage, the Southern furnaces having lost their hold somewhat in the past few weeks. Business in pig iron during the month of May was very fair, and the outlook for June is good, though many expect that there will be no increase in volume over May. Shipments on contracts are being asked for more rapidly, and inquiry continues to be of good proportions. Prices in both Northern and Southern irons are being held quite firmly and it is not expected that there will be any increase in same for some time to come. Quotations are as follows: Lake Superior charcoal, \$13@13.25; local coke foundry No. 1, \$10.50@10.75; No. 2, \$10.25@10.50; No. 3, \$10@10.25; local Scotch foundry No. 1, \$10.50@10.75; No. 2, \$10.25@10.50; No. 3, \$10@10.25; Southern coke No. 1, \$10.25@10.50; No. 2, \$9.75@10; No. 3, \$9.50@9.75; Southern No. 1 soft, \$9.75@10.25; No. 2 soft, \$9.50@9.75; Southern silveries, \$10.25@10.50; Jackson County silveries, \$13@15; Ohio strong softeners, \$12@12.25; Alabama car wheel, \$15.50@16; coke Bessemer, \$11.50@12.

Bar Iron.—The situation in bars has improved somewhat, though sales have been small. Prices have a tendency to weakness, some cutting still being done to catch trade. Quotations are 1@1'10c. for common iron.

Steel Rails.—A slight increase is noted in the demand for the heavier sections of rails, while the lighter sections continue to be bought in fair quantities. Inquiry has developed somewhat, and the outlook is a little brighter. Rails are quoted \$21@23 according to specification.

Billets and Rods.—Billets still continue in limited demand. Rods have had a much larger call during the past few weeks, but the companies in this vicinity are about filled up with orders and nothing of a very large nature could be well taken at the present time. Billets are quoted \$16@16.50.

Structural Material.—Inquiry is about the only thing that has been better in structural line. There

is some small business being transacted, chiefly in bridge material. Beams continue to drop in price, 1'20c. being now quoted. Angles are quoted 1'15@1'20c.; plates, 1'15@1'20c.; tees, 1'40@1'45.

Cleveland. June 2.
(From Our Special Correspondent.)

Iron Ore.—The volume of the sales made during the last week is quite satisfactory. A considerable quantity of Bessemers has changed hands. The ores which figured in the transactions are of all the old ranges and also of the new Mesabi range. Perhaps the largest sales were made to two Wheeling, W. Va., furnaces, which contracted for 300,000 tons. The following are the quotations: Specular and magnetic ores, Bessemer quality, \$3@3.75; specular and magnetic ores, non-Bessemer quality, \$2.50@3.25; hematite ores, Bessemer quality, \$2.50@3; hematite ores, non Bessemer quality, \$2@2.50.

Freight rates remain the same as reported last week, but they may soon be pounded down, as only 10 per cent. of the vessels are tied up at the present time.

Pig Iron.—There has been a good movement of pig iron during the last few days. Although the sales have been small, the aggregate volume indicates a much better condition of the market. The quotations follow: Lake Superior charcoal, \$13.25; Bessemer, \$9.75@10; No. 1 foundry, \$10.50@10.75; No. 2, \$10@10.25; No. 1 Ohio Scotch, \$10.65; No. 2, \$10.15; gray forge, \$8.75@9.

Philadelphia. June 4.
(From Our Special Correspondent.)

Pig Iron.—Dealers and agents are living in almost daily expectation of an improvement in demand. We note great anticipations in other markets of increasing business, but there is not much to boast of here. The patience of people is almost exhausted. The reductions in prices have not helped business in the least, unless the fact of a greater number of inquiries can be taken as encouragement. More iron is made and offered than is wanted and while this is the case forward requirements will not be covered. The trouble is the general iron trade is not improving in the East. Salesmen cannot do much; furnace owners and agents have poor reports. Foundrymen are not getting enough new work to warrant them in taking any chances on possible fluctuations. As for mill irons there is very little to say and prices are very low, \$10 and under for a good deal of iron. No. 2 iron is to be had at \$10.50@10.75; No. 1 X at \$11.75@12.25. Basic iron is \$11.25; standard Bessemer, \$12@12.50, and low phosphorus, \$15. The trade looks for sudden developments.

Steel Billets.—Agents have been trying to prevail on billet users to place large contracts for future delivery at \$16, but no important transactions can be traced. At the same time agents intimate they may not be able to offer these terms very long, but there is nothing definite to go on.

Merchant Bars.—Production is being restricted. Business is poor. Good iron is sold as low as 1c. in large lots. A few mills are able to report more business, but there are many that report less. It is impossible to find much of an encouraging nature.

Sheets.—Inquiry from all possible sources shows that mill-owners are doing a little additional business, but not enough to help prices. Manufacturers are ready to meet buyers on any terms that will allow them a little margin, enough to get out.

Pipes and Tubes.—Business is better in a retail way, but there is a great dearth of work.

Merchant Steel.—A good week's business has been done in tool and machinery steel.

Skelp.—No news at all for the week.

Plate and Tank.—The run of orders continues small and prices are as weak as manufacturers can stand. Tank is 1.10@1.15c.; universals, 1'20c.; flange, 1'30c.; firebox, 1'50c. upward.

Structural Material.—Specifications for large lots, said to go into some thousands of tons, are being figured on, but the parties concerned decline to mention names or amounts. There is no general improvement in sight. Angles are 1'15c.; beams and channels, 1'30c. and upward.

Steel Rails.—Prices are given at \$19@20 at mill. A few small orders and one large one were placed this week.

Old Rails.—Old iron rails are dull at \$11.50@12, and old steel rails at \$10.

Scrap.—Some yard men entertain hopes for July business in scrap. A number of mill men have been looking around to see what sort of stock was to be had and to learn prices. There has been no important business as yet.

Pittsburg. June 3.
(From Our Special Correspondent.)

Raw Iron and Steel.—A very encouraging feature of the market is the better feeling that is manifested in crude steel after so long a period of irregularity and weakness. One of the most significant features of the whole situation at the present time lies in the fact that people everywhere have cut down their expenses, both business and domestic, and many of them are living within their means. There is not the extravagance and

waste which have marked former years, and when it is considered that the business community as a whole has realized the actual condition of affairs and has prudently come to operate and live only as it can afford, it means much to every thinking man. The process of cutting down has been going on for some time, and at least it can be said that American business men, taken collectively, are less inflated than they have been for years. The firmness of certain branches of trade may be taken by consumers as seriously making a movement upward. As yet prices of iron and steel are at an extremely low figure, with more reason for higher than lower prices.

While steel-makers feel that their product is worth more money, there seems to be little encouragement in regard to the immediate future of the iron market. There is too great a supply for consumers to worry about not being able to meet their requirements from week to week at satisfactory prices, and until there is some elimination of the active competing element things are not likely to show much improvement. In some quarters there has been a fair amount of business, but the market, generally, favors buyers. The unsettled feeling in regard to freight rates is also a depressing factor upon the market, deterring buyers and making the pressure to realize more determined. In the local market for pig iron, various kinds of offers are being named.

For wrought-iron pipe the market is active, with an increased demand; some of the mills have sufficient contracts booked to keep them busy for months. Wire rods are in better demand; prices have an upward tendency. Wire nails are also in better demand and prices firm. For finished material demand is improving at unchanged prices; the advance will come later.

Latest.—Business is active, with an advance on certain descriptions; prices still on the upgrade. Bessemer sales were liberal and prices fully maintained. Billets are firm at a slight advance. Billet ends advanced 20c.; wire rods advanced over \$1 a ton. Sheet bars show sales of 6,200 tons at an advance. Skelp iron declined. The outlook is certainly favorable; the only thing to fear is labor troubles. The men employed at Jones & Laughlins, the American Iron Works, have struck against a reduction of 10%; at this writing it looks like trouble. There are contracts pending for 32,000 tons of Bessemer that will be closed before the week ends.

COKE, SMELTED, LAKE AND NATIVE ORE.		SKELP IRON.	
Tons.	Cash.	Tons.	Cash.
8,000 Bess., J. J., Val.	\$9.35	750 Sheared, Pitts.	\$1.15 4 m.
5,000 Bess., J. J., Val.	9.10	500 W. G., Pitts.	1.00 4 m.
5,000 Bess., J. J., Pitts.	9.40	500 N. G., Pitts.	1.00 4 m.
2,000 Bess., June, Val.	8.75	SKELP STEEL.	
3,000 Bess., A. S., Pitts.	9.90	2,000 W. G., Pitts.	\$0.85 4 m.
2,250 Bess., J. J., A. Pitts.	9.90	700 N. G., Pitts.	0.85 4 m.
1,000 Mill L., J. J., Pitts.	8.85	750 Sheared, Pitts.	1.00 4 m.
1,000 Bess., June, Val.	9.00	SHEET BARS.	
1,000 Bess., June, Val.	9.00	4,200 June, Pitts.	\$17.60
500 Bess., July, Val.	9.35	1,500 J. J., Pitts.	17.00
500 Bess., Aug., Pitts.	9.85	1,500 J. J., A. Pitts.	17.85
500 Mill L., prompt.	8.75	MUCK BAR.	
Pitts.	8.75	500 Neu., Del., Pitts.	\$19.00
150 No. 2 F. Val.	8.75	STEEL WIRE RODS.	
100 No. 3 F. Sp. Pitts.	9.50	500 F.o.b., Mill	\$21.60
CHARCOAL.		BLOOMS, BILLETS, BAR ENDS.	
50 No. 2 F. Pitts.	\$15.50	500 Bloom and Billet	ends, Pitts.
50 No. 2 F., Pitts.	15.25	ends, Pitts.	\$9.60
50 Cold Hl., Pitts.	21.51	OLD RAILS AND SCRAP IRON.	
25 No. 3 F., Pitts.	15.25	500 Iron R., gr., Val	\$11.60
BLOOMS, BILLETS, SLABS.		500 Steel R., gross, P.	9.25
5,000 Bill., J. J., A. Pitts.	\$14.40	300 Cast Scrap, gross.	
4,000 Bill., J. J., Pitts.	14.50	Pitts.	8.50
2,000 Bill., June, Pitts.	14.40	200 Wrt. Scrap, net.	9.00
1,000 Bill., J. J., A. Pitts.	13.90	Pitts.	
1,000 Bill., J. J., Pitts.	14.15	150 Car Wheels, gr.	9.00
1,000 Bill., J. J., Pitts.	14.00	Pitts.	
500 Bill., J. J., Pitts.	14.25		
200 Bill., June, Pitts.	14.30		

METAL MARKET.

NEW YORK, Friday Evening, June 4, 1897.

Gold and Silver.

Prices of Silver per Ounce Troy.

May-June.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$l.	June.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$l.
29	4.87	27 3/4	60 1/2	.465	3	4.87	27 3/4	60	.464
31	4.87	27 3/4	60 1/2	.465	4	4.87	27 3/4	60	.464

The silver market has lapsed into a condition of dullness. No special weakness, however, is manifest and the moderate supplies coming forward are absorbed without producing depression. Much of the silver arriving has been sold ahead, so that its shipment does not affect the price.

The United States Assay Office in New York reports the total receipts of silver at 67,000 oz. for the week.

Average Monthly Prices of Silver

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

Month.	1897.		1896.		1895.	
	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.
January	29'74	61'79	30'69	67'13	27'36	59'69
February	29'68	64'67	31'01	67'67	27'47	59'90
March	28'96	63'06	31'34	68'40	28'33	61'98
April	28'36	61'83	31'10	67'92	30'39	66'61
May	27'86	60'42	31'08	67'88	30'61	66'75
June			31'46	68'69	30'47	66'61
July			31'45	68'75	30'48	66'75
August			30'93	67'34	30'40	66'61
September			30'19	65'68	30'54	66'90
October			29'68	65'05	30'89	67'61
November			29'46	64'98	30'79	67'42
December			29'70	65'24	30'40	66'47
Year			30'67	67'06	29'53	65'28

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

Gold and Silver Exports and Imports

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

	Coin and bullion.		In ores.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
April	\$6,629,419	\$619,452	\$1,800	\$319,604	E. \$5,662,163
1897..	7,910,128	2,504,939	91,798	1,390,556	E. 4,106,431
1896..	16,916,572	23,747,264	80,319	453,022	E. 7,203,395
SILV.					
April	4,895,895	578,124	250	1,604,104	E. 2,714,917
1897..	18,470,635	2,698,303	246,950	6,586,388	E. 9,152,954
1896..	20,420,322	4,391,752	554,109	5,543,136	E. 11,039,543

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

Gold and Silver Exports and Imports, New York

For the week ending June 4th, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	\$660,800	\$56,804	\$766,645	\$38,082	E. \$1,332,559
1897..	10,681,647	1,569,825	17,517,306	1,110,781	E. 15,518,347
1896..	28,286,442	16,905,131	15,822,371	899,344	E. 26,304,338
1895..	32,521,622	19,767,141	14,881,456	684,914	E. 26,951,023
1894..	52,583,972	9,270,247	17,290,061	693,739	E. 59,910,047

Of the gold exported for the week this year \$650,000 went to Germany; \$5,800 to the West Indies, and \$5,000 to Central America; the silver went to London and South America. The gold and silver imported came from Central and South America.

FINANCIAL NOTES OF THE WEEK.

No material change can be noted this week in general business. We have still the hesitating condition due to unsettled tariff conditions, aided by the apprehension which exists, as long as Congress is in session, of hasty and injudicious action on the Cuban question. There is every indication that this state of affairs will continue until after the always dull period of August and September has well begun. Occasionally we hear of some improvement in certain lines of business, but it generally proves to be local and spasmodic only.

Some small shipments of gold, \$650,000 in all, were made early in the week, and \$500,000 more is reported taken for Saturday's steamers. It is stated that the demand has at last exhausted the reserve supply of sterling bills which has been carried for some months on loans by the New York banks. At one time this supply was estimated as high as \$50,000,000, but it has now been entirely drawn out.

Some interest has been excited by the statement made by the Secretary of the Treasury to the effect that the Administration intends to take some action on the currency question. Mr. Gage is understood to be preparing a plan, but expects that the appointment of a currency commission will be urged upon Congress, and one will probably be appointed.

The annual meeting of the Eimetallic League was held in Manchester, England, June 2d. Letters of regret were read from a number of prominent members. The annual report contained little that is new. Perhaps the tenor of the meeting was best expressed by a passage from the letter sent by Lord Aldenham, in which he said: "Our objects will be gained if the United States and France or some other great commercial nation agree to carry the matter through, even without England, though it would be only political wisdom to add our forces to theirs."

The receipts of the United States Treasury in May, though the amount for customs decreased from that for April by \$7,569,341, were still large, amounting to \$29,797,390. The payments were \$29,

109,250, showing a surplus of \$688,131. For the 11 months of the fiscal year, from July 1st to May 31st, the Treasury statement is as follows:

	1897-98.	1896-97.
Customs	\$149,182,547	\$154,756,211
Internal revenue	133,155,548	133,854,178
Miscellaneous	17,466,711	22,489,601

Total receipts	\$299,804,806	\$310,600,020
Disbursements	\$26,786,681	\$42,873,141
Deficit	\$26,981,875	\$32,273,121

The largest item of expenditure this year was \$131,013,936 for pensions.

The statement of the United States Treasury on Thursday, June 3d, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	May 27.	June 3.	Changes.
Gold	\$114,100,690	\$144,517,402	I. \$316,802
Silver	21,636,320	24,822,389	I. 186,689
Legal tenders	32,608,801	32,115,187	D. 505,614
Treasury notes, etc.	28,055,999	28,096,657	I. 610,658

Totals \$229,413,720 \$230,151,635 I. \$707,915
Treasury deposits with national banks amounted to \$17,249,881, an increase of \$394,806 during the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending May 29th, gives the following totals, comparisons being made with the corresponding weeks in 1896 and 1895:

	1895.	1896.	1897.
Loans and discounts	\$502,547,200	\$475,155,400	\$507,509,700
Deposits	568,229,400	498,874,100	575,600,000
Circulation	13,256,200	11,005,100	14,329,000
Reserve:			
Specie	70,641,000	62,456,000	88,979,200
Legal tenders	112,137,600	84,493,200	101,536,900
Total reserve	\$182,778,600	\$146,949,200	\$190,516,100
Legal requirement	141,557,350	124,718,525	143,900,600
Surplus reserve	\$41,221,250	\$22,230,675	\$46,616,100

Changes for the week this year were increases of \$2,557,400 in loans and discounts; \$3,458,600 in deposits; \$683,700 in specie; \$800,600 in legal tenders, and \$617,150 in surplus reserve; decreases were \$76,800 in circulation.

The statement of the Treasury Department gives the estimated amount of money in the United States on June 1st as below:

Kind.	In circulation.	In Treasury.	Totals.
Gold coin	\$20,221,923	\$155,167,732	\$375,389,655
Silver dollars	53,007,095	397,311,546	450,318,641
Subsidiary silver	60,306,988	16,210,920	76,517,908
Gold certificates	37,887,829	1,455,341	39,343,170
Silver certificates	362,768,898	1,576,696	374,345,594
Treas. notes 1890.	85,641,416	29,140,874	115,782,290
U. S. notes	248,848,704	97,832,313	346,681,016
Currency certifi.	65,785,000	780,000	66,565,000
Nat. bank notes	224,166,143	7,109,699	231,275,842

Totals \$1,659,733,895 \$716,785,119 \$2,376,519,014
The estimated amount in circulation decreased \$6,826,488 in May. As compared with June 1st, 1896, there was an increase of \$138,149,612. The changes in June were increases in gold dollars, subsidiary silver, United States notes and national bank notes; decreases in silver dollars, silver certificates and currency certificates. The amount in circulation June 1st was \$22.80 per capita.

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:

	1896.		1897.	
Banks.	Gold.	Silver.	Gold.	Silver.
N. Y. Assn.	\$62,456,000	.....	\$88,979,200	.....
England	239,177,755	.....	180,131,155	.....
France	402,260,144	\$251,205,610	397,599,500	\$246,020,100
Germany	230,270,000	.....	229,675,000	.....
Austro-Hung.	136,710,000	64,130,000	171,400,000	63,146,000
Netherlands.	13,175,000	34,975,000	13,150,000	34,831,000
Belgium	19,529,000	.....	20,333,000	.....
Spain	42,028,000	55,288,000	43,335,000	51,287,000
Italy	61,715,000	10,380,000	60,015,000	11,780,000
Russia	434,530,000	.....	482,710,000	.....

The return for the Associated Banks of New York is of date May 29th; all the others are of June 3d, except the Bank of Italy, April 30th, and the Bank of Russia, April 23-May 5th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Indian Exchange has been lower, and Council bills were taken in London at an average rate of 14'38d. per rupee. The demand for bills has not been heavy.

The coinage executed at the Mints of the United States during May and the five months of 1897 is reported by the Treasury Department as below:

	May.	Five months.
	Pieces.	Value.
Gold	588,990	\$4,489,950
Silver	2,140,000	1,600,000
Minor	5,833,000	109,130

Total 8,561,990 \$6,199,080 37,417,389 \$53,696,716.51
In addition to the above there were coined 60,017

Ten-Colone pieces, valued at \$279,292 for the government of Costa Rica.

Prices of Foreign Coins.

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

	Bid.	Asked.
Mexican dollars	\$.47 1/2	\$.49
Peruvian soles and Chilean pesos	.42 1/2	.45
Victoria sovereigns	4.88	4.90
Twenty francs	3.87	3.90
Twenty marks	4.78	4.80
Spanish 25 pesetas	4.78	4.85

Other Metals.

Copper.—Inactivity characterizes the market, but values have so far been fairly well maintained. Whether this can be done much longer if the prevailing dullness of trade should last is a question that we would not dare answer in the affirmative. As yet, producers have sufficient orders to take care of their current production, which, in the aggregate, is very heavy. Prices are more or less nominal, and must be quoted 11@11 1/2c. for Lake; 10 1/2@10 3/4c. for electrolytic copper in cakes, wire-bars or ingots; 10 1/2@10 3/4c. for cathodes, and 10 1/2c. for casting.

The foreign market, which early in the week opened at £49, has since declined to £48 10s., but closes to-day at £48 15s. for spot and £49 for three months prompt. Though the copper industry abroad continues in a flourishing condition, orders for the raw material show quite some falling off this week, manufacturers undoubtedly expecting to be able to lay in new supplies at lower prices by assuming a waiting attitude. Whether or not their expectations will be realized depends on the development of business here, which is far from brisk. We quote manufactured sorts: English tough, £51 15s.@£52 5s.; best selected, £52 5s.@£52 15s.; strong sheets, £50; India sheets, £56@£56 10s.; yellow metal, 4 1/2d. The statistics for the second half of the month show an increase in supplies of 800 tons.

Tin has kept steady, with prices practically unchanged, at 13'55c. for spot and June and 13'50c. for more distant delivery. Consumption is not quite as good as it was until a few weeks ago, suffering, like all other metals, under the general depression that we are just now experiencing.

The foreign market, which closed last week at £61 10s. for spot, opened on Monday at the same figure, but closes to-day at £60 15s @ £60 17s. 6d. for spot and £61 5s.@£61 7s. 6d. for three months prompt. The statistics for the month of May show an increase in the supplies of 900 tons, from which it would almost be safe to conclude that the unfavorable conditions which have governed the course of this metal, an excess of supplies over the demand, as well as the course of the silver market, still exist.

The stocks of tin on May 31st are reported as follows, in tons of 2,240 lbs:

	In store.	Afloat.	Totals.
London	19,524	2,690	22,214
Holland, Banks and Billiton	5,922	1,300	6,322
" Straits	600	1,200	1,800
U. S., exc. Pacific ports	1,860	2,180	4,040
Totals	27,066	7,370	34,436
1896	.....	.....	30,843

Exports of tin from the Straits Settlements in May are reported at 3,300 long tons, against 3,695 tons in May, 1896.

Lead.—There have been only retail transactions during the last few days at values unchanged from those established last week. Offerings, however, are no longer as pressing, and though this has not resulted in the establishment of higher figures, it has at least kept prices from going still lower. Not even the fact that the lead ore question was to come up for debate in the Senate during the last few days was able to give an impetus to the market, which closes at 3'25c.

The foreign market continues firm at £11 16s. 3d. @£11 17s. 6d. for Spanish, and £11 18s. 9d.@£12 for English. Supplies are still reported as being very meager.

The New York Metal Exchange estimates the arrivals of lead in New York for May at 4,050 long tons, 4,000 tons coming from Mexico and 50 tons from Europe. Exports of Mexican lead in bond were 5,082 tons, of which 157 tons went to Canada and 4,925 tons to Europe. Withdrawals from bond for consumption were 210 tons. The stocks of lead in bond at New York and near-by ports on June 1st were 6,231 tons against 7,473 tons on May 1st.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is firm, but very quiet. Prices remain 3'07 1/2c. for Missouri lead and 3'10c. for argenteriferous brands. Neither buyers nor sellers are making any effort to trade, preferring to await the outcome of the Senate action on the lead schedule.

Spelter continues very firm at about 4'10c. St. Louis, and 4'30c. New York. Inasmuch as the supplies are far in excess of the demand, the higher prices are not likely to be maintained, unless there is an improvement in the demand, or the surplus production, which must again assume rather large proportions, be exported.

The market abroad is somewhat firmer, closing at £17 7s. 6d. for ordinary brands and 2s. 6d. higher for specials.

Antimony is unchanged at 7 1/2c. for Cookson's, 7c. for Hallett's, 6 1/2c. for U. S. Star and 6 1/4c. for Japanese.

Nickel.—Business continues quiet, and no change in prices can be reported. We quote for ton lots 33 1/2@36c. per lb., and for smaller orders 35 1/2@38c. London prices are 14@16d. per lb., according to size of order. The London price is about on a parity with New York, allowing for the duty of 6c. per lb.

Platinum.—Prices are firm at \$14@15 per oz. New York. The London quotation is 55s.@50s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotations, the prices given being respectively for orders of over 250 grams, for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 54c., 55c. and 56c. per gram. Wire and foil are 52c., 53c. and 54c. per gram.

Quicksilver.—The New York quotation is unchanged at \$39.75 per flask. The London price stands at £7 7s. 6d. per flask, with the same price named from second hands.

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

Aluminum: No. 1, 98% ingots, 37@41c.	Bismuth, 98 lb.	\$1.50@1.80.
No. 2, 94% " " 31@34c.	Phosphorus, 98 lb.	50c@55c.
Ingots, scrap, " 30c.	Tungsten, 98 lb.	70c.
Rolled sheets, " 46c. up	Ferro-tungsten, 6%	60c.
Alum.—Nickel, " 35@40c.		

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

Average Monthly Prices of Metals

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

	COPPER.		TIN.		LEAD.		SPELTER.	
Month.	1897.	1896.	1897.	1896.	1897.	1896.	1897.	1896.
Jan.	11.75	9.87	13.44	13.02	3.04	3.08	3.91	3.75
Feb.	11.92	10.64	13.59	13.44	3.28	3.19	4.02	4.03
March	11.80	11.03	13.43	13.30	3.41	3.14	4.12	4.20
April	11.48	10.98	13.31	13.34	3.32	3.07	4.13	4.07
May	11.03	11.15	13.44	13.51	3.26	3.03	4.21	3.98
June	11.07	11.07	13.59	13.59	3.03	3.03	4.10	4.10
July	11.40	11.40	13.63	13.63	2.95	2.95	3.97	3.97
August	10.98	10.98	13.49	13.49	2.73	2.73	3.76	3.76
Sept.	10.66	10.66	13.15	13.15	2.77	2.77	3.60	3.60
October	10.66	10.66	12.94	12.94	2.80	2.80	3.72	3.72
Nov.	11.23	11.23	13.09	13.09	2.96	2.96	3.99	3.99
Dec.	11.28	11.28	12.96	12.96	3.04	3.04	4.14	4.14
Year	10.88	10.88	13.29	13.29	2.98	2.98	3.94	3.94

Imports and Exports of Metals.

	Port.	Week, June 3.		Year, 1897.	
		Expts.	Impts.	Expts.	Impts.
*New York.					
Aluminum, boxes	.....	.....	1,552	.....	.....
Antimony ore, short tons	.....	.....	.....	463	.....
regulus, casks	.....	.....	.....	183	.....
Brass, old, short tons	.....	.....	231	95	.....
Copper, fine, long tons	803	16	28,565	1,819	.....
matte, " "	.....	.....	4,344	111	.....
sulphate, " "	.....	.....	4,335	.....	.....
Ferro-manganese, " "	.....	.....	929	52	.....
Iron ore, " "	.....	.....	9	9	.....
Iron, pig, bar, rod, " "	.....	.....	4,805	1,419	.....
pyrites, " "	.....	.....	.....	5,370	.....
Lead bullion, " "	1,450	.....	15,900	19,960	.....
Manganese ore, " "	.....	.....	9,123	11,337	.....
Nickel, " "	.....	.....	455	10	.....
Spiegeleisen, " "	.....	.....	1,213	11,337	.....
Steel, billets, rods, " "	8978	345	12,413	9,250	.....
Tin, " "	.....	.....	919	1,114	.....
" dross, " "	.....	.....	37	.....	.....
" and black plates, boxes	.....	23,525	.....	372,565	.....
Zinc, " dross, long tons	.....	.....	1,585	1,089	.....
" dross, " "	.....	.....	242	.....	.....
†Baltimore.					
Chrome ore, long tons	.....	.....	.....	5,511	.....
Copper, fine, " "	720	.....	15,815	.....	.....
sulphate, " "	.....	.....	1,423	.....	.....
Ferro-manganese, " "	.....	.....	2,418	25	.....
Ferro-silicon, " "	.....	.....	.....	69	.....
Iron ore, " "	.....	4,232	.....	121,81	.....
Iron, pig, bar, etc., " "	.....	50	80	1,664	.....
Lead, " "	.....	.....	120	300	.....
Manganese, " "	.....	.....	.....	4,759	.....
Spiegeleisen, " "	.....	.....	.....	680	.....
Steel, " "	.....	.....	2,710	221	.....
wire, bundles	120	1,542	1,497	1,175	.....
Tin, " and black plates, boxes	.....	2,064	.....	3,339	.....
Zinc, " long tons	.....	.....	.....	18,467	.....
" dross, " "	.....	.....	.....	46	.....
‡Philadelphia.					
Antimony, casks	.....	.....	.....	2,707	.....
Copper ore, long tons	.....	.....	.....	15,009	.....
Ferro-manganese, " "	.....	.....	.....	48	.....
Iron ore, " "	.....	5,895	.....	58,672	.....
Manganese ore, " "	.....	3,950	.....	47,155	.....
Tin, " and black plates, boxes	.....	25	.....	318	.....

*New York Metal Exchange returns. †From our Special Correspondent. ‡Week ending May 28. §Week, May 27.

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements see page 591.)

New York. June 4.

Heavy Chemicals.—This market showed a fairly good movement in the sodas and bleaching powder this week, principally on old contracts. The latter article was very firm in view of the 1/4c. duty proposed. Prices on the other hand have not yet been influenced by the business done.

We quote: Caustic soda, 60%, \$2.10@2.15; 70@76; \$1.90@2 per 100 lbs. Alkali, 58%, 60c. for 50-ton lots and over, and 70@80c. for smaller quantities; 48%, \$1@1.20 for jobbing lots. Carbonated soda ash, 48%, 90@95c. per 100 lbs.; 58%, 75@80c. per 100 lbs. Bleaching powder, prime brands, \$1.75@1.87 1/2; Continental, \$1.55@1.75 per 100 lbs. Bicarb. soda, English, 1.75@2c. per lb.; American, bulk, \$1.50@3.50 per 100 lbs., according to make. Sal-soda, English, 60@65c. per 100 lbs.; American, 55@60c. (in barrels), and 75@80c. in kegs. Chlorate of potash, 8 1/4@10c. per lb.

Acids.—The trade shows little change, and deliveries now being made are mainly on orders placed some time ago. Quotations per 100 lbs. in New York and vicinity in lots of 50 carboys or over are as follows: Acetic acid, commercial No. 8 (in barrels), \$1.40@1.50; in carboys, \$1.50@1.65; redistilled, 28%, in bbls., \$1.70@1.80; in carboys, \$1.90@2.05. Muriatic acid, 18%, 75@85c.; 20%, 85@95c.; 22%, \$1.15@1.25, according to make and quantity. Nitric acid, 36%, \$3.50@4; 40%, \$4@4.50; 42%, \$4.50@5.50. Oxalic acid, \$7.25 ex-dock and \$7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66%, 85c.@1 in carload lots, 10@15c. higher for small quantities. Chamber acid, \$6@6.50 per ton at factory. Blue vitriol, \$4@4.25, according to grade and order.

Brimstone.—The Sicilian market is weaker. The trade in America is very quiet. Best unmixed seconds are quoted at \$20 for spot sales, and \$19 for shipment. Thirds are selling at \$18 1/4 per ton for shipment; no spot goods.

Fertilizing Chemicals.—Only a moderate volume of business is being transacted. The potash salts continue to move on regular contracts. Both dried blood and sulphate of ammonia are very quiet, but their prices do not show a marked change. We quote:

Sulphate of ammonia, gas liquor, \$2.12 1/2 for shipment and \$2.17 1/2 for spot; bone, \$2.05@2.10 per 100 lbs. Dried blood, high grade Western, \$1.55@1.60 per unit, New York; f. o. b. Chicago, \$1.32 1/2 per unit. Azotite, \$1.50@1.55 basis New York. Concentrated phosphate (30% available phosphoric acid), 57 1/2c. per unit. Acid phosphate, 13%@15%, av. P₂O₅, 54@65c. per unit at sellers' works in bulk. Dissolved bone black, 17%@18% P₂O₅, 80c. per unit. Acidulated fish scrap, \$8.50@9, and dried scrap \$17.50@18, f. o. b. fish factory. Tankage, high grade, \$12@12.50 per ton; concentrated, \$1.27 1/2 per unit, f. o. b. Chicago; New York, \$17.50@18; low grade, \$16.50@17. Bone tankage, \$19@20; ground bone, \$21@23. Bonemeal, \$19.50@22.50. Sulphate of Potash: 90%, New York and Boston, \$1.40 1/2; Philadelphia, Baltimore and Norfolk, \$2.01; Southern ports, \$2.03.

Double Manure-Salt: Quotations for 48@49%, less than 2 1/2% chlorate, are 1.01@1.01 1/2c., to arrive, and 1.02@1.03c. on spot; basis of 43%. High grade, 90@98% sulphate of potash, 1.96 1/2@2.00 1/2c. to arrive; basis of 90%. In bulk 24@33%, 56 1/2@37 1/2c. per unit O. P.

Muriate of Potash: We quote: New York and Boston, 1.75@1.78c. Philadelphia and Norfolk, 1.76@1.79 1/2c.; Charleston, Savannah, Wilmington and New Orleans, for 80@85% basis of 80%, 1.78 1/2@1.81c. in lots of 50 tons and upward.

Nitrate of Soda.—This market is quiet, but easier. There was an arrival on May 27th of 25,000 bags. Quotations are 1.75@1.77 1/2c. for spot; 1.70@1.72 1/2c. to arrive, according to position.

Messrs. Mortimer & Wisner, the well-known brokers of this city, send us the following statement of nitrate of soda, issued under date of June 1st, 1897:

	1897.	1896.	1895.
	Bags.	Bags.	Bags.
Imported into Atlantic ports from West Coast S. A., from Jan. 1, 1897, to date.....	255,103	377,084	567,666
Stock in store and afloat June 1, 1897, in New York.....	136,736	72,037	72,905
Boston.....	2,380		7,262
Philadelphia.....			8,400
Baltimore.....	4,000	3,000	4,500
Norfolk, Va.....			421
Charleston.....			1,500
To arrive, due Sept. 15, 1897.....	170,000	222,000	214,500
Vis. supply to Sept. 15, 1897.....	313,116	297,037	309,488
Stock on hand Jan. 1, 1897.....	123,533	53,839	58,367
Deliveries past month.....	77,032	33,281	57,507
Deliv. since Jan. 1 to date.....	235,580	355,885	331,045
Total yearly deliveries.....		746,264	828,042
Prices current June 1, 1897.....	1.72 1/2	1.77 1/2@1.78	1.70@1.72 1/2

NOTES OF THE WEEK.

Messrs. J. M. Lang & Company report the shipments of high-grade Florida phosphate rock through the port of Savannah, Ga., as follows: To Bremen, Germany, 2,020 short tons; Hamburg, 1,296 tons; Rotterdam, Holland, 3,875 tons; total, 7,191 tons. This shows an increase of 1,254 tons over the preceding month.

The shipments of phosphate rock through the port of Punta Gorda, Fla., during May, 1897, are reported by Albert F. Dewey at 2,618 tons to domestic and 7,634 tons to foreign ports, a total of 10,252 tons. For the year 1897 to May 31st the shipments aggregated 45,065 tons. The Peace River Phosphate Mining Company made all the shipments in May.

Liverpool. May 25. (Special Report of Joseph P. Brunner & Co.)

There is no new development in chemicals since our last report, and although the market is firm generally, there is not much activity in trade.

Soda ash is firm, with a moderate business passing. Quotations vary as to export market, and range for tierces may be called about as follows: Lebanc ash, 48%, £4 10s @£4 15s. per ton; 58%, £4 15s. @£5, net cash; ammonia ash, 48%, £3 7s. 6d. @£4 per ton; 58%, £3 12s. 6d. @£4 5s., net cash. Bags are 5s. per ton under price for tierces.

Soda crystals are in request at £2 17s. 6d. per ton, less 5% for barrels, and 7s. less for bags.

Caustic soda is in fair demand. The nearest spot range as to market is about as follows: 60%, £6 3s. 9d. @£6 5s. per ton; 70%, £7 3s. 9d. @£7 5s.; 74%, £8 2s. 6d. @£8 5s.; 76%, £8 15s. @£9 5s., net cash.

Bleaching powder continues quiet at £6 15s. @£7 per ton, net cash, for hardwood packages, as to market.

Chlorate of potash is slow at about 3 1/4d. @4d. per lb.

Bicarb. soda is unchanged and is selling to a fair extent at £6 15s. per ton, less 2 1/2% for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia keeps steady at £7 18s. 9d. @£8 2s. 6d. per ton, less 2 1/2% for good gray, 24% and 25% in double bags f. o. b. here, as to quality.

Nitrate of soda is quiet at £8 2s. 6d. @£8 5s. per ton, less 2 1/2% for double bags f. o. b. here, as to quality and quantity.

Carb. ammonia, lump, 3d. per lb.; powdered, 3 1/4d. per lb., less 2 1/2%.

MINING STOCKS.

Complete quotations will be found on pages 590, 591 and 592 of mining stocks listed and dealt in at:

Baltimore.	Helena.	London.
Boston.	New York.	Mexico.
Butte.	Philadelphia.	Paris.
Cleveland.	Pittsburg.	Rossland.
Colo. Springs.	Salt Lake.	Shanghai.
Denver.	San Francisco.	Valparaiso.
Duluth.	Spokane.	

New York. June 4.

For a few days only was the local mining stock market active, but at the close it was again quiet. At the Consolidated Stock and Petroleum Exchange business is fair, though not what had been expected from the recent spurt in the prices of the silver stocks.

Trading in Mollie Gibson is dormant, a condition which some say has been brought about by those who hold stock and will not put it on the market in anticipation of further rich strikes being made on the property. At the Mining Exchange the asking price on June 1st was 55c., against a bid of 53c., and on the following day there was a bid of 37c., which is 39c. less than the quotation for the stock on May 28th last. Some mining men term the Mollie Gibson a "pocket" mine, and say that streaks of rich silver ore are likely to be found periodically. The strike reported last week was made between the first and second levels, and the ore body is estimated to be 12 ft. in width, having a 4-ft. streak of silver which is expected to widen. Several months of unsuccessful work have been done on the property, and the above-mentioned strike is really the first rich ore that has been opened up in that time. It may be remembered that the first company to operate the property was the Mollie Gibson Mining and Milling Company, which went into bankruptcy, as it did not find ore in paying quantities.

In October, 1889, the old owners (Mollie Gibson Mining and Milling Company) consolidated with the present concern, forming the Mollie Gibson Consolidated Mining and Milling Company. This company was organized under the laws of Iowa in October, 1891, with a capital stock of \$5,000,000, fully paid up, divided into 1,000,000 shares at \$5 each.

The officers of the company are J. J. Hagerman, president; R. J. Bolles, vice-president; C. E. Palmer, general manager, and H. C. Lowe, secretary and treasurer. The property of the company is in Aspen and lies at the foot of Smuggler Mountain. It consists of the Mollie Gibson, Lone Pine, Saquoit, Silver King, Jennie V., and several other mining claims which cover in all about 60 acres. The first dividend was paid in April, 1891, amounting to \$50,000. There have been distributed in dividends up to January, 1895, \$4,080,000, but none have been paid out since the latter date.

The cheaper Cripple Creek stocks are attracting

some attention at the Mining Exchange. Stocks that sell in blocks by the thousand have been taken up by the brokers. In what are considered the higher-priced stocks in this group, dealing has been rather meager. In the Leadville stocks there was some bidding for Chrysolite at 9c., but sellers held firm at 12c. Lacrosse sold at 9c., and Little Chief at 16c., the latter stock showing a gain of 2c.

There was a little better tone to the Comstock group of stocks. Consolidated California & Virginia, however, dropped 15c. to \$1.70. Ophir sold between 80 and 90c., and Best & Belcher at 66c., the latter stock ruling 3c. better than last week. There was one sale of Comstock Tunnel at 5c., and 300 shares of Gould & Curry at 20c. Hale & Norcross advanced to 85c. from 80c. a few weeks ago, and Savage receded 5c. to 30c. since May 25th.

The California stocks were very quiet, only two of them being traded in this week. Standard Consolidated receded to \$1.40 from \$1.50 last week, which is 50c. less than the quotation in June last year. Brunswick Consolidated sold at 8c., which is an advance of 2c. over the last quotation.

The Utah stock, Horn Silver, ruled steady this week at \$1.65, with sales of 400 shares. The present low price of lead has made it impracticable for this company to pay any further dividends, so it is running its plant only to pay expenses. During the corresponding period in 1896 this stock sold at \$2.20 @ \$2.25, but it has receded steadily with the fluctuations in the lead market. Moulton of Montana was sold this week at 7@8 1/2c., which is about 13c. less than the price on February 3d last.

On the whole, the present prices of all mining stocks are less than those which ruled in June, 1896.

Boston. June 3.

(From Our Special Correspondent.)

The past week has been a very dull one for mining stocks, the attention of operators being given to the general stock market which offers greater attraction for the average trader. There have been few changes in prices, and those in the direction of lower figures. Boston & Montana, after selling at \$122 1/2, rallied to \$124 1/2, and then declined to \$123 1/2, with sales of less than 2,500 shares for the week. Butte & Boston has ruled dull, selling at \$17 1/2, with decline to \$16 1/2 at the close.

Calumet & Hecla sold at \$372 @ \$375 for small lots. Quincy was quiet at \$108 @ \$109; closing sale at \$108 1/2. Tamarack sold at \$120 and closed at \$119. Franklin advanced on the reports from the new mine and sold up to \$14 1/2, a gain of \$1 1/2 for the week. Osceola was weak on account of a recent decision against the company which may involve heavy loss, and declined from \$31 to 28 1/2, but later recovered partly to \$29 1/2, closing at \$29 1/2. Kearsarge was a little firmer and sold up to \$17 1/2, losing the fraction only at the close. Old Dominion sold at \$15 1/2 and declined to \$15. Tamarack, Jr., also declined from \$16 1/2 to \$15 1/2. Centennial sold at \$6 1/2, but in later dealings declined to \$5 1/2. Wolverine was neglected; only small sales at \$9 @ \$9 1/2. Arnold was steady at \$27 1/2 @ \$3 1/2.

In gold stocks Pioneer was fairly active at a decline from \$3 1/2 to \$2 1/2, with last sale at \$2 1/2. Gold Coins advanced \$1/4 to \$4 1/4. Santa Ysabel advanced to \$13 1/2, but lost it later and sold at \$12 1/2. Merced was steady at \$8 1/2 @ \$9.

At the afternoon board there was an improvement in both activity and prices. Boston & Montana sold up to \$124 1/2 and then declined to \$123 1/2. Franklin advanced to \$16 1/2 and held the advance. Tamarack also advanced from \$119 to \$123 and closed there. Tamarack, Jr., advanced \$1 1/2 to \$16, and Osceola \$1/4 to \$29 1/2.

Cleveland. June 2.

(From Our Special Correspondent.)

As has been anticipated by some of the holders of iron mining stocks in this city, the heavy stock of ore on Lake Erie docks and at some of the mines is beginning to have its effect on their investments. Some of the mining companies have been compelled to retrench expenses at the mines and decrease the output. It was said by a prominent broker to-day that this condition was, in part at least, responsible for the fact that the stock market has been very quiet during the past week. But few sales have been reported and none of them have been of much consequence. Pittsburg & Lake Angeline, which was held at \$70 last week, is now offered for \$65. That is the only change in the quotations.

Los Angeles. May 29.

(From an Occasional Correspondent.)

The new board of directors of the Los Angeles Mining and Stock Exchange is taking hold with the full intent of pushing matters and the new secretary is doing everything within his power to further the interests of the Exchange and to carry out the plans of the board. It may be of interest to note that some of the most prominent men of Los Angeles have now identified themselves with this Exchange and become interested in mining in the last few months, and the purpose is to bring such people together and to create in Los Angeles a mining center. It seems to be not yet generally known that mining interests in Los Angeles have been greatly advanced during the past six months by the discovery of several good mining camps in Southern California. The Los Angeles Mining and Stock Exchange has been organized in response to the demand for mining investments. With the view of aiding mining

and of facilitating the investment of capital, the Exchange in its reorganized form starts out under favorable auspices.

It is the purpose of the Exchange to scrutinize closely the merits of the properties entered on its lists, to guard carefully its own reputation, as well as those who deal in its projects. The Exchange now numbers among its members 75 active men, and the membership committee is using every effort to secure at least 50 more new members before opening calls. It is expected that business will be begun about June 7th.

The stocks which will be dealt in include the Wedge Mine and the Rand Mountain, of the Randsburg District; the Pacific Consolidated, of the Red Rock District; the Gold Cliff, of Pearce, Ariz.; the Lillian Gold Mining Company, of Seattle, Wash., and the Cariboo, of British Columbia.

Among the active members of the Exchange are Messrs. G. J. Griffith, E. P. Johnson, Wilder O. Dow, E. K. Alexander, J. A. Fairchild and R. L. Craig. Mr. C. F. Pepper is president, and H. M. Russell vice-president. The secretary is L. F. Parsons, who was at one time secretary of the Colorado Mining Exchange, of Denver.

Salt Lake City. May 29.

(Special Report of James A. Pollock.)

Business in the local mining share market was not marked by any special activity, except in spots in the gold section. On the silver side there were more selling than buying orders, but stocks of that character have not touched a low range. On very light business, Ajax sold lower again; the offerings are not heavy, however. Anchor was dull and lowering. Comparatively little change occurred in Bullion-Beck, but the tendency was still downward. Buckeye did only light business, and that at shaded prices. Centennial-Eureka was again inactive and quotations remained about unchatged. Only light offerings of the stock are being made at present low quotations. Several large holdings have been increased with the cheap stock. The management of the Chloride Point are still talking of a mill; little was done locally in the stock. Neither of the Dalys was active and quotations remained without change. Preparations for the starting of the mill continue. Dalton was active, but unchanged. D. xter was not active. Eagle was stronger, under increased inquiry. On only limited selling, Galena was shaded slightly. Geyser-Marion was active and stronger. The May dividend comes on the 31st. Horn Silver was not active. Lucky Bill has another assessment on. Little Pittsburg was very active at practically better prices. A slight reaction occurred in Mercur, when operations were suspended for a few days, for the purpose of completing the mill capacity increase. The shading of prices was but natural after the great advance. Mammoth was hardly as active as usual. Mercur Gold Dust has given orders for its mill. Northern Light was active and about unchanged. Ontario will pay its usual dividend on June 1st. The stock was somewhat lower. Sunbeam sold lower, but buying orders for any cheap stock were numerous. Silver King was not active, but the limited amount of stock offered was at shaded figures. Sacramento advanced several points on speculative buying and reports that a dividend would be paid next month. Sunshine was unchanged. Both of the Swanses were weaker, in sympathy with the silver situation. Tetra has levied an assessment of 1c. per share to continue development work. Utah did not change, continuing fairly strong.

San Francisco. May 19.

(From Our Special Correspondent.)

At the opening on Monday the Middle Comstocks and Gold Hill stocks occupied attention, and trading in them was fairly active. There was some fluctuation in prices, but the market was generally rather firm, and there was unusual interest in the trading.

Toward the middle of the week the market quieted off and was rather dull again, but on Friday there was a revival of activity, chiefly on buying orders from Virginia City, which led to reports of some new find; but these were generally regarded with a good deal of doubt, and the close was rather uncertain. This unsteadiness was helped by the prospect of a holiday and no session of the exchanges on Monday.

Some closing quotations are: Consolidated California & Virginia, \$1.80@1.90; Chollar, \$1.17@1.22; Ophir, 94@96c.; Hale & Norcross, 80@85c.; Potosi, 65@68c.; Best & Belcher, 59@61c.; Sierra Nevada, 41@43c. There were a few sales of Standard Consolidated at \$1.45@1.50.

Secretary John W. Pew, of the Standard Consolidated Mining Company, reports that all the stock of the old Bodie Consolidated, Bulwer Consolidated and Mono mining companies has been surrendered and exchanged for Standard Consolidated shares, with the exception of the following amounts: Bodie Consolidated, 581 shares; Bulwer Consolidated, 783 shares, and Mono, 667 shares. Standard Consolidated stock bearing one dividend of 10c. per share is ready to exchange for these outstanding shares at the agreed rates.

Judge Belcher, of the Superior Court, has set aside his order sustaining the demurrer to the complaint in the quo warranto suit begun by G. W. and R. R. Grayson, Thomas Cole and others against M. W. Fox, Thomas McDonald and others, to oust them from their positions as directors of the Hale & Norcross Mining Company, and has ordered a full hearing of the case. This is a victory for the Grayson side. In

his original order sustaining the demurrer of the Fox people Judge Belcher held that the law authorizing such a proceeding to test the title to an office does not apply to offices in private corporations, but only to public corporations, in which the public has an interest.

Spokane, Wash. May 29.

(From Our Special Correspondent.)

There was more activity on the Stock Exchange this week than for some time past, but the bears are still at work hammering prices. The total sales this week amounted to 314,633 shares, of which 85,933 shares were sold on call and 228,700 shares after hours. The stocks attracting the most attention were Noble Five Consolidated of Slocan, of which 95,000 shares changed hands at private figures; Iron King, 120,000 shares, also at private terms; Novelty, 53,000 shares, at 1½@2¼c.; Phoenix, 13,000 shares at 5c., and Butte with a like number of sales at 1½@2¼c. In consequence of the activity shown by the bears with regard to Cariboo, large blocks of this stock were thrown on the market, but the sales recorded amounted only to 700 shares at 47c., ex-dividend, and 49c. Grand Prize ruled steady at 1c. with sales of 6,933 shares, while Little Giant and New York each sold 2,000 shares at 6c. Wonderful showed dealings in 2,500 shares at 5@6¼c.; Poorman, 1,000 shares at 5½c.; St. Elmo, 2,000 shares at 5c., and Reservation, 500 shares at 4¼c.

It is evident now that the Exchange will remain in business. The week just closed has brought more satisfaction to the brokers than had been expected, and we look forward to a good share of the prosperity which is to come from speculation in the stocks of the mines that are now being so successfully worked in British Columbia and the Northwest.

London. May 25.

(From Our Special Correspondent.)

There has been another boom in South Africans this week. The cause this time has been the reported agreement between Mr. Chamberlain and Dr. Leyds as to the future government of South Africa. Dr. Leyds as Secretary of State of the Transvaal has hitherto been consistently anti-English and has gained all his experience of Englishmen in South Africa. He has probably found in the Colonial Office in London a different class of men from those at Johannesburg, and this has enabled him to unbend a little. The mere rumor of an amicable understanding between him and the British government is considered a strong bull point on the Stock Exchange and buying has once more set in. There are still many bears who have not yet been able to cover, who hoped that the recent boom would die away and prices fall back again. These are now trying to get back, and their efforts are so persistent as to help the rise in quotations. The chief interest has, as usual lately, centered round Gold Fields, which have advanced to nearly £8. Of course, the whole of the new issue of 725,000 shares at £1 each have been snapped up, but the policy of the directors in pursuing this method of issue is still unexplained. East Rands have been prominent this week, owing to the issue of a circular explaining the position of the company. For some time, as I have mentioned in these letters, the company has been short of funds, and the directors and shareholders have not been able to agree on a method of increasing the capital. Money was required for new mills at the Comet, Angelo and Driefontein mines as well as for general expenses, and it was borrowed on mortgage from Messrs. Beit, Neumann and others to the extent of £300,000. Just recently another £75,000 was obtained from Mr. Farrar, who is the chairman. He has just arrived in this country to look after the rearrangement of the company's capital. A year ago it would have been possible to issue new shares at £7 each, but at the present time the price is £3 and buyers are not plentiful. No proposition is before the board or the shareholders. Mr. Farrar intends to consult the chief supporters informally before any definite scheme is put forward. The bears on the market made several attempts to check the upward advance in Gold Fields and other shares by disseminating unfavorable reports of all sorts. For instance, it was confidently stated that the Orange Free State had just passed unanimously an Alien Immigration law similar to that of the Transvaal, and that the Transvaal had revoked its decision to repeal its own act. This report was officially contradicted within a very short time, but while it was out it had no effect, as everybody is convinced of the present friendliness of the Dutch States and the British government.

The reports which come to hand from Chartered land are depressing. The trouble with the natives still causes worry, and all mining operations are at a standstill. There are very few mining men there who are able to direct operations intelligently, while the want of labor and the cost of supplies effectually check progress. Altogether the outlook is gloomy, but it has very little effect on Chartered shares, which are now in the background.

The West Australian market has been pretty brisk in sympathy with South Africans. Promoters took the opportunity to sell a few of their shares on the strength of reports prepared for the occasion. Nothing in the way of genuine business occurred.

The Indian section suffered somewhat by a report that the Champion Reef was not able to treat its tailings through a lack of water supply. The shares in this company and others in the Colar gold-field fell slightly, but later on in the week it was found

that the difficulty was only temporary, and a general recovery took place. For some months now attention has been turned to the shares of the lesser Indians. This week Kempinkote has been at the front on the announcement that the company had at last struck what promises to be a pay lode.

The company has had many ups and downs and has tried three different properties.

The New Zealand and the American markets have not been in evidence this week. British Columbians have also suffered a lull. There is a feeling abroad that English promoters have no chance of acquiring payable properties. This is the opinion always expressed in this column. The only chance for Englishmen to get good properties for themselves is to go to British Columbia and discover some for themselves. If they attempt to bond claims they only get rubbish offered them. The Horne-Payne group of promoters, who direct the Lillooet, Fraser River & Cariboo Gold Fields, Limited, have formed a new company called Sunshine, Limited, to acquire the Silver Cup, Moonshine and Towser claims in Kootenay.

Paris. May 23.

(From Our Special Correspondent.)

The upward movement of the Transvaal gold stocks has been in some measure maintained, and has attracted a great deal of attention, drawing interest away from other sections of the market. So many people are interested in these stocks that the new rise draws sellers from every direction.

Next to this the metallurgical shares have been the most active. All the great companies are busy now, while orders for ships and other constructions are still coming in. There has never been a time when our steel works had so much work in sight.

The metal markets are not especially active, but the shares of the copper companies hold their prices well, and those of the lead and zinc companies are not depressed.

It is reported from Sofia that Bulgaria is about to adopt a single gold standard. The new currency law, with a gold ley (equal to 1 franc, or 19.2c.) for a unit, is already published. The gold, silver, nickel and copper coins at present in circulation will be retained, and bronze coins of 19, 5, 2 and 1 centimes added to the currency. Foreign silver may no longer be accepted. All accounts must be kept in Bulgarian currency. The Finance Minister is authorized to withdraw 20,000,000 francs worth of silver 5-franc pieces and replace them with gold. The date when the law will be put in force has not yet been fixed. It will be decided by the Council of Ministers, and approved by the Prince shortly.

The political situation shows little change, but in view of the activity in other directions foreign uncertainties have affected the market very little this week.

AZOTE.

Rossland, E. C. May 27.

(From Our Special Correspondent.)

There is a noticeable lull in the business of the camp, and as a result of this there is some uneasiness. A number of properties, the names of which became familiar to the public during the past few months, are more or less tied up, and the activity is almost confined to the producers. These were enumerated in my last and include the Columbia & Kootenay, which has, the manager informs me, just shipped two carloads of ore to the Trail smelter and is now making regular shipments. The Rossland camp, having passed the prospectors' stage, is now entering upon what may be called the trying period. The dissolution of its Stock Exchange has been followed by an arrangement made between a section of the late exchange and the Board of Trade, by which the scope of the latter is to be enlarged more in the direction of a mining exchange than a purely trade concern. This arrangement is likely to give more satisfaction than the late exchange did, but the details are yet wanting.

In all probability a hearty invitation will be extended to the mineralogical section of the British Association for the Advancement of Science by the mining men of Rossland to visit the mines the present summer. This invitation will be strongly seconded by the Board of Trade and the citizens generally.

MEETINGS.

Golden Scepter Mining Company, special meeting at Room 416 Mining Exchange Building, Denver, Colo., on June 12th at 12 m.

Hartford Gold Mining and Milling Company, deferred meeting at 109 East Huerfano street, Colorado Springs, Colo., on June 20th at 6 p. m.

Holy Cross Gold Mining and Milling Company, annual meeting at 63 Railroad Building, Denver, Colo., on June 14th at 10 a. m.

Peruvian Consolidated Mining Company, annual meeting at Commercial Block, Salt Lake City, Utah, on June 10th at 2 p. m.

Reservation Mining and Milling Company, annual meeting at the office of the company in Spokane, Wash., on June 14th at 2 p. m.

LATE NEWS

ATLANTIC MINING COMPANY.—The output reported for May by this Michigan copper company is 296½ tons, an increase of 16½ tons over the April report, and an increase of 38 tons over May, 1896.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Alice, Anaconda, and others, with columns for location, par value, and prices for various dates from May 29 to June 4.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing companies like American Coal, Col. Fuel & L., and others, with columns for location, par value, and prices.

Official quotations. New York Stock Exchange, mining 30 shares; other stocks, 27 1/2 shares; Consolidated Stock and Petroleum Exchange, mining 9,970 shares; Mining Exchange, 44,350 shares. Total shares sold, 62,365. * Bid and ask quotations.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, PA, listing companies like Cambria Iron, Choc. & Gf. Cts, and others, with columns for location, par value, and prices.

Official quotations Philadelphia Stock Exchange. * Bid and asked quotations. † Holiday. Total sales, 1,247.

PITTSBURG, PA.

Table of stock quotations for Pittsburgh, PA, listing companies like Allegheny, Carnegie, and others, with columns for location, par value, and prices.

Official quotations Pittsburg Stock Exchange.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Etina Con., Allouez, and others, with columns for location, par value, and prices.

Official quotations Boston Stock Exchange. † Bid and ask quotations. Total sales, 15,469. ‡ Holiday.

BALTIMORE, MD.

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

Official quotations Baltimore Stock Exchange.

CLEVELAND, O.

Table of stock quotations for Cleveland, O, listing companies like Aurora, Cleveland-Chiffs, and others, with columns for par value and prices.

BUTTE, MONT.

Table of stock quotations for Butte, Mont., listing companies like Aile g. s., Am. Dev. & M., and others, with columns for par value and prices.

HELENA, MONT.

Table of stock quotations for Helena, Mont., listing companies like Am. Dev. & M. Co., Bald Butte, and others, with columns for location, par value, and prices.

Special Report of Samuel K. Davis. Total shares sold, 15,000.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, Cal., listing companies like Alpha Con., Alta, and others, with columns for location, par value, and prices.

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

STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colorado, listing various companies like Etna Gold, Anaconda, and others with their respective prices and par values.

Official quotations Colorado Mining Stock Exchange. Bid and Ask quotations. Total shares sold, 937,400.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colorado, listing companies like Alamo, Anaconda, and others.

Official quotations Colo. Springs Mining Stock Assoc. Total shares sold: Listed, 310,883; unlisted, 42,000.

SALT LAKE CITY, UTAH. Week ending May 29

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Alliance, and others.

Special Report of James A. Pollock. All the companies are located in Utah. Ex-div.

SPOKANE, WASH.

Table of stock quotations for Spokane, Washington, listing various companies like Butte, Cariboo, and others.

Official quotations Spokane Stock Exchange. Selling prices. Shares sold: Listed, 36,320; unlisted, 15,900; total, 52,220 shares.

ROSSLAND, BRITISH COLUMBIA.

May 27.

Table of stock quotations for Rossland, British Columbia, listing companies like Alberta, Big Chief, and others.

MEXICO.

Week ending May 26.

Table of stock quotations for Mexico, listing companies like Altazara, Amistad y Concordia, and others.

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

STOCK QUOTATIONS.

LONDON.

May 21

Table of stock quotations for London, listing company names, countries, capital, par value, last dividend, and current quotations.

*Ex-dividend. †Dividend pending. ‡Reconst or increase of capital paid. §Rights pend.

ASSESSMENTS.

Table of assessments for various companies, including location, date, and amount.

*New assessment.

PARIS.

Week ending May 21.

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

VALPARAISO, CHILE.*

Apr. 10.

Table of stock quotations for Valparaiso, Chile, listing company names, locations, capital, and prices.

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

SHANGHAI, CHINA.*

April 30.

Table of stock quotations for Shanghai, China, listing company names, countries, and prices.

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

DIVIDENDS.

Table of dividends for various companies, including company name, date, and amount.

* May dividend paid.

NOTE.—This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information. Readers of the Engineering and Mining Journal will confer a favor on the publishers if they will notify the Journal of any errors or omissions in the above table.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

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

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,330,000 in dividends and the Cons. Virginia \$42,300,000. § Dividends paid since consolidation. ¶ Bodie, Bulwer and Mono transferred to Standard Cons., January, 1897. * Dividends have not been paid in several years. NOTE.—This table is corrected up to June 1. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

