

THE ENGINEERING AND MINING JOURNAL



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

Vol. LXII. JULY 25. No. 4.

RICHARD P. ROTHWELL, C. E. M. E., Editor
 ROSSITER W. RAYMOND, Ph. D., M. E., Special Contributor.
 SOPHIA BRAEUNLICH, Business Manager.
 THE SCIENTIFIC PUBLISHING Co., Publishers.

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Main Office: 253 Broadway (P. O. Box 1833), NEW YORK.
 (Cable Address, "ROTHWELL," New York. Use McNeill's or A B C 4th Edition Code.)

Branch Offices: Chicago, Ill., Monadnock Building, Room 737.
 Denver, Colo., Boston Building, Room 206.
 San Francisco, Cal., 12 Montgomery Street, Rooms 11 and 12.
 London, Eng., E. Walker, Man'g., 20 Bucklersbury, Room 366.

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A prosperous and paying mining company is the finest thing in the world for trade, especially if those responsible for the management have enlightened and go-ahead views. This has been well illustrated by a sale recently made by the Calumet & Hecla of 20,000 tons of scrap iron, being worn out and cast off machinery; what a benefit the manufacture of that machinery must have been to thousands first and last, and what further benefit has been produced by the improved machinery that has taken its place, soon no doubt to give way to further improvements.

It is claimed by critics of the Calumet & Hecla management that these 20,000 tons of scrap, sold naturally at the price of scrap, represented an expenditure by the company of not less than \$4,000,000, while others more friendly to the Calumet Company place the original cost at between \$3,000,000 and \$4,000,000. The best defense that can be made by the Calumet & Hecla Company is that they have spent profits in trying to reduce cost of product, and that the result has been a production up to date of 1,006,838,795 lbs. of refined copper. Dividends paid to date \$44,850,000. Number of men employed in mine and mills at present, 3,456.

Forest Fires.

The terrible disaster that has taken place and is still continuing in Washington and British Columbia raises the question whether by some joint action on our part, initiated through the Forestry Division of the Department of Agriculture, and the Forestry Department of the Dominion of Canada, greater safeguards against forest fires could not be provided.

The interests affected, national, individual and indirect, such as the mining industry, are common to both sides of the frontier, and to attempt to separate them would be impossible. The millions of dollars lost in value of timber consumed belonging to the two governments and to individuals as owners by purchase or lessees are possibly, in the long run, quite equalled by the indirect damage caused by destruction of timber suitable for mining purposes and for the necessary construction of the large reduction works of different descriptions throughout the various mining camps.

In most cases these forest fires originate in carelessness from campers out, prospectors or possibly tramps, and against much of this criminal recklessness it is impossible to guard. No possible number of foresters could protect such enormous areas covered by timber, and once started, such a fire as has occurred in the Trail Creek region cannot be put out. It may be checked by heavy rain and die out for lack of wind and close-growing fuel, but without a miracle these forest fires will burn so long as there is anything to feed them.

Sometimes there is a small compensation for a great loss, and in this case the future prospecting over the burnt region ought to be somewhat simplified. The forest authorities are on the spot, and are doing all they can, but this is practically nil. These fires are not confined to the Trail Creek and Rosland districts, but are overrunning the whole of the Province, the new district of Alberni having been a severe sufferer, the total loss being placed in this new and so far small district at \$500,000, apart from timber losses.

The difficulties in the way of forest administration, pointed out by Mr. B. E. Fernow in 1891, are as follows:

1st. The lack (so long as virgin forests are still available) of sufficient pecuniary interest to secure private forest management, though this might already be profitably introduced in certain localities.

2d. The impracticability of forcing private owners to manage their forests in such a way as to secure the advantage of the community at less immediate profit to themselves.

3d. The present incongruous, shortsighted and unjust regulations as to the timber lands of the government, whereby depredations by fire are especially invited, and the resident population is forced to resort to theft and fraud, in order to supply their present wants, at the same time endangering their present needs and interests.

4th. The opposition, honest and dishonest, aroused by any plan of remedy for this abuse.

British Guiana.

The hoped for approaching settlement of the boundary dispute between the Governments of Great Britain and Venezuela has attracted much attention to the actual value of the hitherto undeveloped district. We have recently had in our columns some interesting and reliable information as to the probable value of the district in question and its prospects under a liberal and enlightened government, one that would spend revenue in the development of the region, in place of pocketing all of it, and that could be depended on not to impose prohibitory import duties for provisions, supplies of all kinds and machinery.

To such a country, as will be appreciated by any one who has studied the subject, it is necessary that the greatest possible aid, encouragement and assistance, within of course the bounds of sound polity, be given by

the government, as means of communication cannot be opened up without such co-operation.

The development of the gold industry of British Guiana may be said to have started in the year 1864, but it has been hampered right along by disputes as to ownership of territory. One of the earliest enterprises in 1866, when sufficient capital had been provided from some Australian capitalists, was wrecked on account of a protest from the Venezuela government claiming sovereign authority. The mine was abandoned, and all the tools, machinery, etc., were left to rot. Twenty years later some systematic search for gold was made with the result that British Guiana has become one of the recognized gold-producing countries of the world.

The difficulties that attend the search for gold were not wanting in this case, and in many respects these difficulties may be said to have been multiplied, exaggerated, and presented in new phases.

The climate, want of even the roughest means of communication, the large advance in the price of negro labor when engaged for this class of work, the cost of getting goods into the interior and last of all and not least important the difficulty of getting reliable and practical men as prospectors were only a few of the special obstacles.

The entire attention of these prospectors till within the past few years has been devoted to alluvial gold, with the result that in 1893 the output was 142,788 oz. This result was attained by most primitive methods and by local capital, and although the returns for 1894 and 1895 show a falling off, being 129,670 and 123,023 oz., respectively, since 1893 only, has there been serious attention to prospecting for quartz veins and their development and ultimate working.

The total output of gold from 1884 to 1895 shows that even with the rude appliances and the physical and economical difficulties to overcome, the result of the work and struggle has been material. Starting with 250 oz. in 1884 the highest figure was reached in 1893, as mentioned above, and the average production in the past four years has been over 131,000 oz. of gold per annum.

With regard to the quartz veins and the possible future of the country, if means of communication were afforded and good and equitable government assured, we learn from several sources that the Barima and other districts in the disputed territory are quite capable of cutting an important figure as a factor in the production of the world's gold supply.

British Guiana has gone through the usual experience of company promotion, more or less fraud and insane speculation following 1893, but at present it has settled down to a very cool and conservative attitude, waiting the result of the boundary question now pending. Of the new capital invested, prospecting for quartz veins and development work on the same, with some small amount of machinery shipped in, there is as much American as Colonial or British, and for this reason we trust that the final settlement of the matters in dispute will be a satisfactory one, affording guarantees to investors.

Pig Iron Production in 1896.

We have noted in our columns from time to time the gradual decrease in pig-iron production during the present year. With the uncertain condition of general business, and, especially during May and June, the absence of active demand for raw iron and the low range of prices, many furnaces have been going out of blast, and their places have but partly been filled by those which have started up. This has been especially the case with the anthracite furnaces in the East; nearly all of them were active during the boom of 1895, but under the conditions now prevailing a number of them have found it impossible to compete with the coke furnaces of Western Pennsylvania and Ohio and with the Alabama iron-workers, and have withdrawn from the field. As usual, we find that it is the larger and better situated furnaces which remain active, and, setting aside a small number obliged to stop for repairs after long runs, it is the smaller and older stacks which have dropped out. The number of anthracite furnaces in blast dropped from 56 on January 1st to 40 on July 1st, showing a decrease in number of 16, or 28.5 per cent., while the change in the coke furnaces was from 163 to 128, a loss in number of 35, or only 21.4 per cent.

An exception to the general rule is found in the charcoal furnaces, the number in blast having actually increased from 23 on January 1st to 28 on July 1st. This has doubtless been due to the enlargement of the demand for charcoal pig from the car-wheel makers and for other special purposes. The charcoal furnaces of Western Connecticut and of the Hoosic and Taghkanic valleys in New York are generally at work. The same thing may be said of the Hanging Rock District, while several of the Alabama charcoal stacks have started up.

We have now the complete statistics of pig-iron production and stocks for the first half of 1896, as collected and prepared for the American Iron and Steel Association by Secretary James W. Swank; and we give below the total production of pig iron for the half year, classed by the fuel used,

comparison being made with the first and second halves of 1895. The figures are in gross tons of 2,240 pounds:

	1895.		1896.
	First half.	Second half.	First half.
Anthracite.....	487,479	783,420	684,011
Coke.....	3,497,078	4,452,990	4,155,528
Charcoal.....	103,001	112,340	136,697
Totals.....	4,087,558	5,358,750	4,976,236

The total production for the half-year, therefore, showed a decrease of 382,514 tons, or 7.1 per cent., as compared with the second half of 1895, but an increase of 888,678 tons, or 21.7 per cent., as compared with the first half. As is almost inevitable in a period of falling production, these official figures for 1896 are slightly below our previous estimates.

If we examine the figures by States, we find that the chief falling off this year has been in New York, New Jersey, Pennsylvania and Ohio that is, to particularize somewhat, in the anthracite district, in the Pittsburgh district and in the Mahoning and Shenango Valleys. In Georgia, Alabama and Tennessee the production for the half-year was about the same as in the second half of 1895; in Illinois, Michigan and Wisconsin there was an increase. In the following table we give the production in all the States which reported over 100,000 tons each:

	1895.		1896.
	First half.	Second half.	First half.
Pennsylvania.....	2,087,381	2,613,732	2,246,753
Ohio.....	632,571	831,218	743,444
Illinois.....	376,401	629,690	638,186
Alabama.....	390,553	464,114	464,205
Virginia.....	142,580	204,009	231,685
Tennessee.....	114,169	133,960	134,354
Wisconsin.....	53,750	94,650	102,586

The most notable increases shown were in Virginia and Wisconsin.

The production of Bessemer pig shows a decrease of 428,000 tons from the second half of 1895, though there was an increase of 399,649 tons over the first half. We give below the production of Bessemer iron with its proportion to the total output:

	1895.		1896.
	First half.	Second half.	First half.
Total production.....	4,087,558	5,358,750	4,976,236
Bessemer pig.....	2,402,023	3,221,672	2,793,672
Proportion of Bessemer.....	58.8%	60.1%	56.2%

The production of spiegeleisen and ferro-manganese for the half-year was 83,010 tons, which compares with 73,011 tons in the first half of 1895, and 98,713 tons in the second half.

The decrease in Bessemer pig does not imply a corresponding decline in the steel production, owing to the very considerable increase in the number of open-hearth furnaces at work. The figures for the total steel production are not yet at hand, but the probability is that the decrease shown will be comparatively small for the half year just closed.

An interesting point in this connection is the output of basic pig iron, which is this year reported separately for the first time. The total for the half-year was 199,595 tons, of which 127,448 tons, or 63.7%, were made in Pennsylvania, and 47,546 tons, or 23.8%, in Virginia and Alabama. The remaining 24,601 tons were reported from New York, Ohio and Wisconsin. The probability is that the output of this class of iron will increase largely and steadily.

We find from this report that not only did the production of iron decrease, but there was also an increase in the unsold stocks on hand. These stocks, which on January 1st were reported at 444,332 long tons, had grown on July 1st to 644,887 tons, showing an increase during the half year of 200,555 tons, or 45.1 per cent. That is, the decrease in actual consumption or sales of pig iron, as compared with the second half of 1895, was 593,069 tons.

The present indications are that the current half year will show a further decline, and that the output of 1896 will show a total a little below the high point reached last year; though it will almost certainly exceed 9,000,000 tons, leaving the United States still in the first rank among the iron producers of the world.

NEW PUBLICATIONS.

ANNUAL REPORT OF THE INSPECTOR OF MINES OF THE STATE OF KENTUCKY 1895. C. J. Norwood, Chief Inspector, Louisville, Ky. State Printers Pages 386; illustrated.

The mining industry of Kentucky at present derives its chief importance from the coal mines, though the State has other mineral resources, including iron ore, lead, barytes and fluorspar, while recently attention has been attracted to its petroleum, and explorations for oil have been begun over a considerable area, with prospects of important developments. It is not improbable, also, that the phosphate belt of Tennessee extends into Kentucky and that workable beds may be found there.

The coal industry is already of much importance, the output in 1895 having reached a total of 3,207,770 tons, while the average number of men employed was 7,865. The Kentucky coals are generally of good quality, and the output includes some varieties which are especially esteemed, such as the cannel coal of Bell, Carter, Greenup and Johnson counties and the famous "Bird Eye" coal of the Jellico district. A market is furnished by the cities of the State, by the railroads, and lastly by the Ohio River trade, in which the Kentucky mines are securing a steadily increasing share, in the face of sharp competition from the mines of West Virginia and of the Pittsburgh district.

The total number of mines operated in the State in 1895 was 138. The

work of inspecting all these devolves on the chief inspector and a single assistant, and from the number of inspections reported and the number of recommendations made and the consequent improvements introduced, it appears that the work has been closely and carefully performed. Mr. Norwood has had many years of experience in the State and is thoroughly acquainted with its mines and the conditions under which they are operated, and this appears very clearly in the report before us, in which we find much to commend. The statistics have apparently been carefully collected and are clearly and concisely stated. The information given is of a kind which must be of value to the operators; and the recommendations made are generally practical and to the point. It is a satisfaction to read such a report, especially when it is contrasted with some others which we have met; and one is inclined to congratulate the State on the possession of an official who not only understands his work, but is evidently absorbed in it and determined to do good service.

Some very interesting particulars are given as to ventilation and other work at the mines, and as to the extension of machine mining last year 26% of the coal raised was mined by machine, and the use of mechanical coal cutters is steadily extending. The advance in method secured under the mining law and the carefulness of the inspection are shown by the fact that the number of accidents has been steadily decreasing for several years, and in 1895 was smaller than ever before in comparison with the output.

In addition to the report proper and the summary of the mining laws, there are several additions of interest. These include papers on "Coal Dust as an Explosive Agent," "Coking and Coal Washing at Earlington," "Steam Tests of Kentucky Coals," "Mineral Wealth of Kentucky," "The South-Central Petroleum District," and on "Phosphates in Kentucky." They are all of practical interest and directly related to the work of the mines.

The chief inspector is also curator of the Geological Department, and he urges the advantages of publishing a volume on the geology of the State, the material for which is all at hand and which would be of much service.

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.

Commercial Relations of the United States with Foreign Countries during the Years 1894 and 1895. Volume II. Washington, D. C.; Government Printing Office. Pages, 646.

Report on the Mines and Mineral Statistics of Michigan, 1896. By George A. Newett, Commissioner of Mineral Statistics. Lansing, Mich.; State Printers. Pages, 183; with maps, diagrams and illustrations.

Map of Surveyed Lode Claims in Camp Floyd District, Utah. Compiled and drawn by Charles Tappan, U. S. Department Mineral Surveyor, and C. Mostyn-Owen, civil engineer, Salt Lake City, Utah. Scale 600 ft. to one inch.

REDUCTION OF LEAD ORES CONTAINING ZINC.*

A criticism of a process described by W. Borchers in a previous number of the same journal. The process has been tried in Colorado and New Mexico, and has not there been found successful as a method of treating these refractory ores. The author regards another method, devised by E. Lungwitz, as more hopeful. The ordinary method of reducing zinc by distillation depends upon the fact that it volatilizes at its temperature of reduction. Now, the boiling point of a liquid depends upon the pressure; hence, by increasing the pressure in the furnace, it ought to be possible to prevent the volatilization of the zinc. The necessary pressure is the vapor pressure of zinc at its temperature of reduction (or at the temperature of the furnace). C. Burns has shown that at about 76 cu. cm. pressure the boiling point of zinc rises about 1.5° C. for each centimeter. According to this the vapor pressure of zinc may be estimated at about 5 atmospheres at 1,500° C. But this temperature is never attained in zinc furnaces; 1,200° or 1,300° would be nearer the mark. Furthermore, zinc and lead alloy at high temperatures. Hence, a pressure of 3 atmospheres should suffice. Lungwitz's process is based on these principles. If it proves as successful as the writer anticipates, the pure zinc will still be prepared electrolytically; but the starting point will not be zinc sulphate, but the zinc which separates out from the lead baths.

In a note appended to the above, W. Borchers maintains the opinions he had previously expressed.

Production of Coal in British India.—The production of coal in British India last year was 3,065,500 tons, showing an increase of 244,848 tons as compared with 1894. When the comparison is extended to 1895, the increase is carried to 1,771,279 tons.

Adoption of Gold Standard in Costa Rica.—The Government of Costa Rica has issued a decree withdrawing its present system of currency and adopting a gold standard.

Young Method of Starting Dry Oil Wells.—The invention is by Tapley W. Young, of Washington, and consists of an electric heater, which can be lowered into the well. The electricity is generated in large quantities, and so powerful is its heat that the refuse matter, which clogs the pores of the oil stone, will be melted and run out, causing a fresh upward flow of oil from wells that have been flowing and have played out. It has been common to use torpedoes to shatter the stone at the bottom of the well, thus breaking up the clogged matter. By the Young method the machine, which is about 3 ft. long, and resembles an iron cartridge, is placed at the bottom of the well and the electricity turned on so powerfully that it receives just enough voltage to produce an enormous heat without melting the metal.

CONCENTRATION OF LOW-GRADE IRON ORES.

Written for the Engineering and Mining Journal by Wm. B. Phillips.

In a paper read before the Atlanta meeting of the American Institute of Mining Engineers, October—th, 1895, I described a process for concentrating low-grade iron ores, not magnetic, which was based on rendering them magnetic and then separating the sand, etc., over a magnetized belt or drum. In brief, the method of treatment was to raise the ore, in small lumps, to red heat and pass producer gas over it. The ferric oxide is reduced to magnetic oxide, and this can be separated magnetically. The experiments were conducted on a working scale, the kiln holding 110 tons of ore, and the results, so far as concerned the enrichment of the heads, were satisfactory. It was found possible to take an ore of 40% of iron and 37% of siliceous matter, and bring the iron in the heads to nearly 60% and the silica to about 11%.

It was then remarked that the main difficulty in the success of the process was in imparting to the ore a sufficient degree of magnetism. The ore used was the soft red ore of the Clinton formation at Birmingham, Ala. This ore is composed of ferric oxide held in a more or less siliceous cement, the cementing material itself also carrying iron. It is of a granular texture, the siliceous pebbles being always round, or rounded, and varying in size from a mustard seed to a No. 4 shot. Some of the ore is quite coarse grained, but ore of medium and even of fine grain is frequently met with. As mined it would carry something less than 40% of iron, and from 35% to 38% of silica, with from 4% to 7% of moisture. In its natural state, undried, it does not take kindly to fine crushing, as it clogs the machines and refuses to pass the screens. It becomes something like moist clay, or talcose schist fills the interstices of the screens and slides along over them. When dried it is crushed and screened without serious difficulty. It is a remarkable fact that the material passing a 50 or 40-mesh screen is much richer in iron than the coarser stuff. Ore carrying 35 to 40% of iron, when crushed to pass an 8-mesh screen, will yield about 25% of its weight through a 40-mesh screen, and this fine stuff will carry from 50 to 53% of iron. The material remaining on a 20-mesh screen will not differ, in respect of iron, from the original ore, to any considerable extent. This simple concentration of a portion of the ore was one of the points brought out by the chemical work attending the experiments. In order to avail oneself of it, however, care must be taken to limit the amount of fires, as when these exceed 80% they begin to lose in iron.

Further experience with the process of magnetization, preceding concentration, has confirmed the opinion that with this class of ore there is great difficulty in securing uniform and regular magnetization. The insufficient magnetizing shows just where one might expect, viz., in the large amount of iron carried by the tails. The heads and middlings may be fairly good, the former noticeably so, but the main trouble is with the tails. If the ferric oxide be not converted into magnetic oxide it cannot be separated from the silica by the ordinary type of magnetic separator. The conversion of as large an amount as possible of ferric oxide into magnetic oxide is the cardinal point of the process. Theoretically, if one could change all of the ferric oxide into magnetic oxide, and then crush the ore to such a degree of fineness as to effect the mechanical separation of the ore into magnetic oxide plus siliceous matter, the removal of the silica would be comparatively easy. But here is the rub. To do this is by no means easy, and after experimenting for three years the conclusion has been reached that it is practically and economically well-nigh impossible to do it. If this were the only means at disposal for the improvement of these ores the experiments would doubtless have been continued, as, in spite of many obstacles and discouraging circumstances of many kinds, they seemed to point toward a considerable degree of success. Doubtless many of the obstacles that appeared insurmountable would have yielded to persistent attack, and we would have found a way to render the ore sufficiently magnetic for our purposes.

It was stated in the paper referred to that it had been found possible to magnetize lumps of ore as large as a cocoanut. This was true, but at the same time such lumps would come to the discharging doors alongside of smaller lumps that were magnetic only on the outside. A long course of experiments with a magnetizing kiln constructed on the general lines of the one mentioned, but much superior to it in many respects, showed that the finer portion of the ore passing a 1/2-mesh screen, was more highly magnetized than the lumps, and that it was more difficult to loup this fine stuff than to loup the lumps. This gave us a hint as to the proper treatment of the ore in the kiln, and we acted upon it with advantage. But the old trouble with the tails remained, although in somewhat less degree. The amount of iron was reduced, but was still entirely too high, being 30% and above. When we drew the ore from the kiln over perforated iron plates with half-inch round holes, and sent the screenings to the crusher and separator, we obtained much better results than when we sent the entire material. The finer stuff was more magnetic, the heads were richer in iron and the tails poorer, and there was a fall in the ratio between raw ore and usable concentrates. The crusher and rolls and screens, having to treat material already through a half-inch screen, did better work, and we were much encouraged to hope for reasonable success. It seemed to lie in the direction of finer crushing of the ore before attempting to magnetize it; and as the smaller pieces turned over a great many times in their descent through the kiln and consequently exposed every side to the action of the reducing gases, we expected to work along this line. We established one thing beyond question, viz., that at a heat short of bright red magnetization on a large scale was difficult even with fine material, but at this temperature, with material of proper size, the chemical changes involved proceeded regularly and uniformly.

And yet, after all, we were not able to arrive at commercial results. Whether it was that the kiln was at fault, or we lacked the skill that comes only by actual experience, or whether the type of separator was not just what was needed, the fact remains that we were not able to magnetize the ore sufficiently, and the tails carried as much iron as the original ore.

If any one wishes to pursue the matter further the knowledge attained after three years of work and study is very much at his service. We have abandoned the experiments for the present in the hope of being able to dispense with the cost of magnetizing, and the uncertainty that attended

* R. C. Schupphaus, *Jl. Soc. Chem. Ind., Zeits. f. Elektrochem.*

the process, and to concentrate the ore direct. After looking into the matter very carefully, and weighing every circumstance that in any way seemed to bear on the problem, it was decided to attack the concentration of these ores from a different point. If it could be shown that it was not necessary to render the ore magnetic, and that the only treatment required was to dry, crush and size the ore and then separate the silica from it, and avoid in this way the troubles encountered in the magnetization process, it seemed best to take the matter in hand, and let the other process wait. All attempts at jiggling the silica grains out resulted in failure, and of the other wet processes only one, was promising, and this one, from an economical standpoint, was impracticable.

Scientifically it was most interesting, as it proved the possibility of removing the ferric oxide from the silica by mechanical means, a rubbing motion in a current of water being employed. We did not ourselves experiment with this process, confining our work to an examination of the products. The ferric oxide can assuredly be removed in this way, and very clean tails obtained, but the large quantity of water required and the trouble and expense of handling the wet ore, to say nothing of the extreme fineness of the ore on drying, seemed to us to militate against the use of the process. We finally settled on the Wetherill concentrating process, a brief mention of which recently appeared in the *Journal*. We reserve for a future article an account of our experiments with this most ingenious and valuable invention, so full of promise to owners of low-grade ores.

(To be continued.)

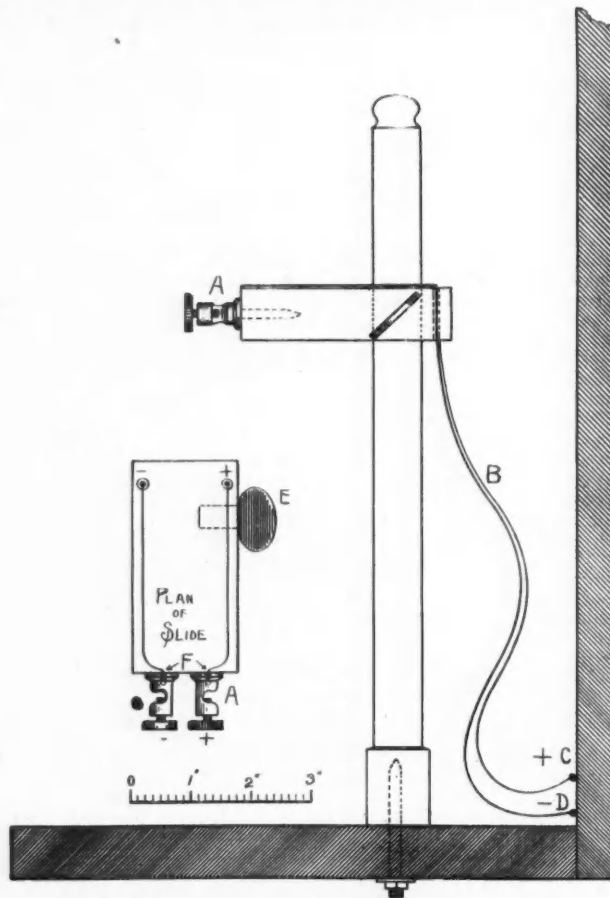
A CHEAP ADJUSTABLE ELECTROLYTIC STAND.*

By G. L. Heath.

Stands for electrolytic work, especially for efficient assaying of copper, should fulfill certain conditions. All joints and connections, as far as possible, should be permanently soldered and very few switches used.

If many assays of the same kind are to be simultaneously conducted, each assay should be independent of its neighbor.

The stands or terminals, for holding the platinum cases or cylinders



ADJUSTABLE ELECTROLYTIC STAND.

and spirals (which are the forms of electrodes generally used in large laboratories), should be capable of instant adjustment to suit a beaker of any height and size, or permit a block of wood to be placed under the beaker, since some chemists prefer, when an electrolysis is finished, to wash the electrodes by quickly slipping out a block, dropping the beaker and replacing it with another of distilled water.

The author has designed and used for several years electrolytic stands which are simple in construction and comparatively inexpensive, and a number of them may be quickly turned out together in any works possessing a carpenter or machine shop.

The drawing shows that the stands each consist of small, turned sticks of oak wood, 1 ft. high, and fastened by a short lag screw, bolt or common screw and washer, to a wooden shelf 1 in. thick, under which are placed the gravity or storage batteries.

A block of wood, of the shape and construction given in the sketch, is

arranged to slide on the wooden post, and fastened by the large screw (E). Into the front end of the sliding block are screwed two brass holders for the "cylinder," or "cone and spiral" electrodes.

All dimensions may be taken from the scale accompanying the sketch. The "single binding posts," given in chemical catalogues, make very good holders if one side of the brass post is filed out opposite the hole as shown in cut (at A).

The cotton-covered (No. 19) connecting wires (B) are connected by soldered joints with two parallel main wires (No. 16) at C, D, and are led up through two small holes at the back of the sliding block and over the top to the brass plugs in front.

These holders or plugs may be screwed in part way, and the bared ends of the wire twisted once around the screw.

The brass plugs are then screwed up tightly in position, the short free end of the wire bent down over the top in a little slot previously filed, and fastened with a drop of solder (as at F).

These neat wooden stands may be set in a single or in a double row in a "staggering" position.

The stands may be arranged in little sets of twos or fours, independent of each other, by breaking one of the parallel main wires at C or D by a switch or removable plug of low resistance.

From each of these groups or sets lead wires with soldered connections may be run to batteries below, and to arrangements of incandescent lamps on the wall above and behind the row of stands, and each group of assays may thus be given a different strength of current, one 16-C. P. lamp being generally sufficient for four copper assays.

The advantage of connecting assays of the same kind in parallel, as indicated in the sketch, consists mainly in the fact that the current is divided up between the assays, lessening the total resistance, and that any electrode may be quickly removed after loosening the screw at A without disturbing the other analyses.

If the laboratory is wired for incandescent (75 volt) lamps, the current obtained from a circuit containing arrangements of 16 or 32 C. P. lamps is more steady than that from small batteries.

If the dynamo only runs at night, a bank of lamps in parallel arc may be arranged as a resistance and the current passing through these, caused to charge two or more storage batteries in series at night. In the morning the direct current, through resistance of lamps, which had been applied to analyses during the night, may then be switched off and the dynamo current also switched off from storage cells, which are then connected up, through suitable resistance coils, in an opposite direction with the copper analyses yet unfinished.

As noted, adjustable resistance coils should be included in the circuit of analyses, through which the storage cells discharge. For a description of such apparatus, I refer to the works of well-known authorities,* † and for different arrangements of incandescent lamps to articles in this *Journal* of 1894 and 1895.

The "chloride accumulator" is thought to be the most efficient storage cell for laboratory work. Three cells in series of the type (5 E. Electric S. Bat. Co., Phila.) require the current of ten 16-C. P. lamps in parallel arc to secure a full charge in one night of 12 to 14 hours, and will, when connected with analyses, give out again for a period of 14 to 15 hours about 80% at two volts potential.

The foregoing descriptions will, it is hoped, be of service to those who have considerable electrolytic work with copper, or other metals, and the stand described is recommended as one that is permanent, easily adjustable and comparatively inexpensive, if set up by the chemist himself.

ON CEMENTATED STEELS.

By Sergius Kern, M. E., St. Petersburg.

In the *Chemical News* we recently gave a description of our process for crucible-steel melting, with a note upon cementated steels, which are necessary for the process. We prepared the steels for trials, in the steel foundry of the St. Petersburg, Naval Port (New Admiralty), as follows:

As we had no special furnace for cementation, we made experiments, using plumbago crucibles 13 in. high and 10½ in. in diameter instead of cementation boxes. The crucibles were heated in ordinary crucible coke furnaces usually employed for copper melting. Two experiments were made, and each time about 50 lbs. of cementated steel was obtained.

1. *Charging the Crucible.*—On the bottom was placed a layer of charcoal 4 in. in thickness; next a layer of rounds, obtained from the punching of open-hearth steel ship-plates (0.18% of carbon). On this layer 2 in. of charcoal were placed, next a layer of rounds, a layer of 2 in. of charcoal, a layer of rounds; and, finally, all the top was filled with charcoal. A burnt clay plug was fitted and well plastered with clay.

2. *Operation of Cementation.*—The crucibles were heated in the furnaces for 4½ hours, and during this time, at the middle of the operation, a fresh charge of coke was made. At the end of the operation, the lids of the furnace were covered with clay all over the seams, the crucibles remaining in the furnace, to cool, for 24 hours. On opening the crucibles, all the three layers of punchings were found to be melted together, and an ingot was found at the bottom of the crucibles which could be easily broken, having an earthy greyish fracture, with numerous spots of graphite.

Analysis of several pieces from this ingot made at the Obouchoff Steel and Cannon Works, St. Petersburg, showed the metal to contain, on the average, 3.60% of graphite and 0.56% of carbon.

The cementated steel, mixed with soft wrought iron and other ingredients adopted in our process, was melted in crucible steel furnaces, for the production of chisel steel, the analysis of which is given in *Chemical News*, Vol. LXXII, p. 192.

This process gives fair tool steel for the works themselves, but certainly the process is not proposed for making high-class tool steel for the trade. The cost of our steel in ready tools (forged at the Port) was about 16s. per pood.—*Chemical News*.

*Clasen's Quant. Anal. by Elect., Am. Ed., pp. 23-28, 1

†E. F. Smith's Electrolysis, pp. 27-28.

*Jl. Am. Chem. Ind.

CONVEYING-BELTS AND THEIR USE.

By Thomas Robbins, Jr.

(Concluded from page 56.)

To me, one of the most wonderful things in connection with this subject is the exceedingly small amount of power required to move enormous quantities of material. The power required, in one case, to run a conveyor, which carries 1,000 tons per day a distance of 180 ft., and elevates it 40 ft. while doing so, is all transmitted by a torn and frayed little 5-in. belt, which takes its power from a pulley on the shaft, and transmits it to a pulley alongside the head-pulley of the belt. The power is here divided, part of it going over a sprocket chain to help drive a large dumping apparatus. Yet the entire amount of power employed for both purposes does not exceed 4 H. P.

It is impossible to give any rule for determining the exact number of horse-power required for conveying-belts running under different conditions, owing to the number of variable quantities which make up the load. One of the most important of these points is based upon the distance between the sets of troughing-pulleys. If they are too far apart the belt sags down between, which materially increases the load. If, on the other hand, the idlers are too near together, the extra number of bearings makes another sort of resistance to be overcome. No general rule can, therefore, be made by which the required horse-power can be accurately determined.

It is a simple matter to determine the necessary belt-weight and speed to perform certain duties when the weight per cubic foot of material is known. If the belt is troughed, it is safe to estimate that the load itself will cover one-half of the belt's total width, and that the depth in the center will be one-quarter of its own width. The area in inches of a cross-section of the load (which we may consider an inverted triangle) will, when multiplied by 12, give the number of cubic inches of material borne by the belt on each running foot of its surface.

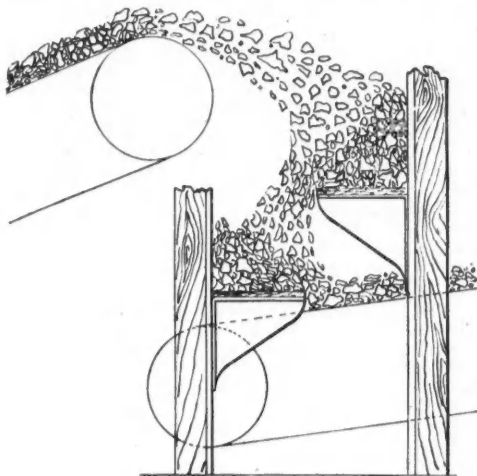


FIG. 8.

The following table will be found of service in determining the capacity of conveyer belts. In regard to this table I wish to say that the results shown are based upon a continuous and even delivery of fine material to the belt. As this is often unattainable in practice, it is well to prepare for uneven and large pieces and for irregular feed by allowing a margin in either belt width or speed, the two factors which govern the capacity of the belt. The widths of belting in most common use are 22, 24 and 26 in., and the average speed is about 300 per minute. I am inclined to favor higher speeds, especially for elevating at an angle, as it requires less power to lift a small-sized load at a high speed than the same amount of stuff per hour in a larger-sized load at a low speed. A good speed for level work is 450 ft. per minute; at an angle, 650 ft. is not at all too fast; and I have seen belts working smoothly at 900 ft. per minute, and at an angle of 27°. Such speed as this, however, is hard on both the belt and idlers.

Having decided upon the proper width of belting for the duty to be performed, the next points to be settled are the proper thicknesses for the belt and for its protecting cover. The necessary number of plies depends upon the length and width of the belt, the weight of the load and the distance between the sets of idler pulleys. The common practice is to use 4, 5 and 6-ply belts.

The thickness of the rubber cover should be based upon the character of the stuff to be carried. For hard material weighing over 50 lbs. per cubic foot, the cover should not be less than 1/4 in. in thickness. With the patent reinforced cover referred to above, it is possible to have this thickness at the center where it is needed, allowing it to taper off to 1/8 in. or 1/4 in. at the sides where the work is lighter. This, of course, makes the cost lower than if the same thickness of cover extended the whole width of the belt. There is now an improved form of this belt which combines the advantages of this thickened cover with stiffened edges which make the belt bend properly at the center and preserve its troughed shape between the sets of idler pulleys and also give it such firmness at the edge that a mere touch against the steering idlers serves to keep it running

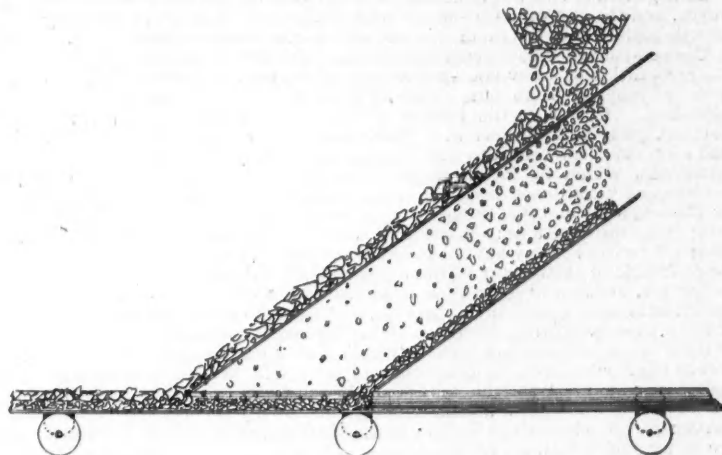


FIG. 9.

Multiply this result by some estimated speed, to get the quantity in cubic inches that the belt will deliver per minute, and then reduce this to the number of feet, yards, pounds or tons delivered per hour, or to other convenient terms.

For example: To find the number of tons of material weighing 100 lbs. per cubic foot that can be delivered by a 24-in. belt running 250 ft. per minute:

As the belt is 24 in. wide, we may safely consider the load as being a triangle standing on its apex, and having a base 12 in. wide and a height of 3 in. Therefore, the area on its cross-section will be 18 in., and there will be 18 x 12 = 216 cu. in. on each foot of the belt. As the speed is

true. This stiffening is done by running two or three plies of duck a part of the way in from the edges, giving all the advantages of a heavier belt but at a lower cost.

At the point where a belt receives its load, it gets as much wear as it meets with in all the rest of its journey. A few points should be borne in mind in connection with this part of the conveyer. The material should not be allowed to drop vertically upon the belt, but should instead be so guided by an interposed chute as to strike it with as nearly as possible the same speed, and, of course, in the same direction as that of the belt itself. This is much the same principle as that which causes a man who wishes to board a fast-moving car to run along a few feet before jumping

TABLE SHOWING THE NUMBER OF CUBIC FEET OF MATERIAL DELIVERED IN AN HOUR BY DIFFERENT WIDTHS OF TROUGHED CONVEYING-BELTS TRAVELING AT VARIOUS SPEEDS.

Speed, per Minute, in Feet, is Shown in the Line Next Below This:

Width of belt, in in.	100.	150.	200.	250.	300.	350.	400.	450.	500.	550.	600.	650.	700.	750.
12.....	187.5	281.2	375.0	468.7	562.5	656.2	750.0	843.7	937.5	1,031.2	1,125.0	1,218.7	1,312.5	1,406.2
14.....	255.0	382.5	510.0	637.5	765.0	892.5	1,020.0	1,147.5	1,275.0	1,402.5	1,530.0	1,657.5	1,785.0	1,912.5
16.....	322.5	483.7	645.0	806.2	967.5	1,128.7	1,290.0	1,451.2	1,612.5	1,773.7	1,935.0	2,096.2	2,257.5	2,418.7
18.....	390.0	581.2	772.5	963.7	1,155.0	1,346.2	1,537.5	1,728.7	1,920.0	2,111.2	2,302.5	2,493.7	2,685.0	2,876.2
20.....	457.5	687.5	915.0	1,143.7	1,372.5	1,601.2	1,830.0	2,058.7	2,287.5	2,516.2	2,745.0	2,973.7	3,202.5	3,431.2
22.....	525.0	781.2	1,042.5	1,306.2	1,575.0	1,843.7	2,112.5	2,381.2	2,650.0	2,918.7	3,187.5	3,456.2	3,725.0	3,993.7
24.....	592.5	875.0	1,170.0	1,478.7	1,787.5	2,096.2	2,405.0	2,713.7	3,022.5	3,331.2	3,640.0	3,948.7	4,257.5	4,566.2
26.....	660.0	968.7	1,307.5	1,671.2	2,006.2	2,315.0	2,623.7	2,932.5	3,241.2	3,550.0	3,858.7	4,167.5	4,476.2	4,785.0
28.....	727.5	1,062.5	1,445.0	1,813.7	2,163.7	2,513.7	2,863.7	3,213.7	3,563.7	3,913.7	4,263.7	4,613.7	4,963.7	5,313.7
30.....	795.0	1,156.2	1,582.5	1,996.2	2,396.2	2,796.2	3,196.2	3,596.2	3,996.2	4,396.2	4,796.2	5,196.2	5,596.2	5,996.2
32.....	862.5	1,250.0	1,720.0	2,175.0	2,612.5	3,050.0	3,487.5	3,925.0	4,362.5	4,800.0	5,237.5	5,675.0	6,112.5	6,550.0
34.....	930.0	1,343.7	1,857.5	2,356.2	2,825.0	3,293.7	3,762.5	4,231.2	4,700.0	5,168.7	5,637.5	6,106.2	6,575.0	7,043.7
36.....	997.5	1,437.5	1,995.0	2,531.2	3,037.5	3,543.7	4,050.0	4,556.2	5,062.5	5,568.7	6,075.0	6,581.2	7,087.5	7,593.7

250 ft. per minute, there will be delivered from the end of the belt 250 times 216 cu. in., or 54,000 cu. in. per minute. This is equal to 31 1/2 cu. ft. per minute, or 1,875 cu. ft. per hour, weighing 187,500 lbs., or about 93 tons per hour.

To save some of the steps referred to above, the following formula may be used. If we let A = width of belt, then $\frac{3A^2}{8}$ = number of cubic inches carried on each running foot of the belt. If a belt is run flat it will carry about one-third as much, or $\frac{A^2}{8}$. It is well to remember that when the width of a belt is doubled, it will carry four times as much material, and when it is tripled it will carry nine times as much.

upon the step, except that in the former case it is the wear and tear upon the vehicle or belt which is avoided instead of injury to the passenger.

If ore or rock is carried, there is bound to be wear wherever it touches. It is well, therefore, if it has to fall any distance, to let its force be broken by striking first against an accumulated pile of itself and then roll off on to a chute, whence it may slide quietly upon the belt and not move until it reaches the end of its journey. Fig. 8 shows the device in use at the New Jersey and Pennsylvania Concentrating Works, at Edison, New Jersey.

The chute should be made of cast iron with sides, and should be so wide that the ore or other metal cannot get jammed. The objection to a wooden chute is that the broken stone or ore does not slide properly upon

it, but runs down in a succession of jumps that are apt to carry it over the side of the chute or off the belt.

A device is shown in Fig. 9 for loading a belt under a crusher, from which falls both coarse and fine stuff. The upper incline represents a grizzly or screen of iron bars which allows nothing larger than 1 in. to go through. The small stuff slides down the lower chute, and forms a bed on the belt to protect it from the impact of the heavier pieces.

There are many ways of joining the ends of carrying-belts, the most common being by the use of metal belt hooks consisting of a set of teeth cast together with a metal back. These have to be destroyed if the belt needs taking up, and a better plan is shown in Fig. 13. The thin steel plates are laid upon a strip of thin leather or canvas which covers the opening in the belt and thus prevent leakage. Staples are driven through the holes in the plate and clinched. In breaking the joint the staples are easily cut with a cold chisel, but the plates themselves can be used an indefinite number of times.

The simplest method of lubricating the bearings is by means of compression grease cups which are dust proof and very economical. They are screwed into the ends of hollow shafts and a man without stopping can give the handles a turn as he walks along the belt, and this only has to be done once a day at most. Grease costing about four cents a pound is generally used.

Some of the purposes for which conveying-belts are used are the carrying of trap-rock and limestone in stone-crushing plants, charcoal and ashes in sugar-refineries, ore in concentrating-plants and mines, ore, flux and fuel in smelters, earth and stone in large excavations, blocks and logs of wood in pulp-mills, clay in brick-yards, coal in breakers, yards, large power-plants and culm-piles, tobacco in process of manufacture, customers' packages in large retail stores, grain in elevators and flour mills, boxed goods in coffee-mills, phosphate ore in the southern mines and chemical fertilizer in plants all over the country. These are only a part of their uses, but the list of other purposes for which, though not employed, they are equally suited, and must some day be applied, would be a very much larger one.

Belts generally cost less to install than any link belt or other metal conveyor, and the cost of maintenance is so much less that there is simply no comparison between them. In addition to this they run noiselessly.

The belt conveyor has been neglected except where its merits compelled the recognition of a few wide-awake and self-reliant engineers. It has been the property of no one. Nobody's living depended upon its exploitation. It was to the interest of no one to stand sponsor for it; to develop, push it and perfect it. There are no data published about it, and each man who uses it to-day is practically the inventor of his own apparatus, which he has brought to its present state only after an expensive and vexatious experience. If an engineer to-day has a conveying-problem to solve and the thought of a belt occurs to him, immediately after come the questions:—What kind of a belt? What width? How should it be run? On what? At what speed? Where can I find out? Being unable to answer any of these questions, and not caring to try experiments, his natural inclination is to state his needs to the well-known manufacturers of conveying apparatus, and to make a contract with one of them, thereby shifting the responsibility as soon as possible. The object of these notes and sketches is to facilitate the use of belt-conveyers and details have been given in order that anyone who wishes to do so may construct a conveyor suitable for his needs.

I do not wish to appear as condemning universally the use of all metal conveyers, for which there are, indeed, some conditions for which they are better suited than are belt-conveyers. I may mention, for instance, places where the point of delivery must be constantly and quickly changed. With iron conveyers this is accomplished by the removal of a section of the iron trough, while a belt requires a movable framework containing two pulleys. This dumping apparatus can be moved to any point in the belt's length.

Brazilian Preferred to Carolina Monazite.—Carolina monazite occurs in irregular crystals, some being as large as a grain of wheat, and requires crushing, for which reasons the Auer-Welsbach Company, of Berlin and Vienna, prefers the Brazilian monazite which comes in the form of a fine sea-washed sand. A ton of Brazilian monazite sand, costing at present in Hamburg \$119, yields, when well worked out, from 20 to 25 kg. of pure thoria, which is worth from \$2,400 to \$3,000, according to degree of purity. Thorium oxide is now worth in Germany from \$120 to \$150 per kilogram, according to purity, and Mr. Mason, Consul at Frankfurt, suggests the establishment in the monazite region of this country, of a laboratory "where by employing the most improved and economical methods, the monazite, including the poorer sands which have been concentrated by a process recently perfected, may be worked up, the thoria extracted and made available as a finished product in all countries where incandescent gas burners are manufactured."

Coal Mining in Germany.—The report of the Harpen mine (Westphalian) points out that the prolongation of the coal syndicate and the moderation shown in the maintenance of prices, and chiefly the growing demand for coal and coke, a result of general trade prosperity, appear to admit of an increase of coal production for two or three years. The demand for coal and coke is rapidly growing, and the shipments by rail are so large that it is sometimes difficult to get a sufficient number of railway cars. The Westphalian Coke Syndicate reports that the increase in coke production during the first quarter of this year compared with the same time in 1895 amounts to 8.1 per cent. The increase in shipments for the same period is 269,000 tons. The orders booked for 1896 are already 405,000 tons larger than the total amount of sales in 1895.

The movement in the coal trade during the first four months of the year is stated as under:

	IMPORTS.		EXPORTS.	
	1896. Tons.	1895. Tons.	1896. Tons.	1895. Tons.
Bituminous coal.....	1,359,984	1,115,685	3,667,463	3,090,991
Brown coal.....	2,385,912	2,032,246	4,485	5,370
Coke.....	128,663	146,361	682,821	753,822
Briquettes.....	23,039	20,906	69,980	67,961

Exports of coke during the same time show a decline of 71,000 tons, compared with last year.

MATTE SMELTING IN CALIFORNIA.

Written for the Engineering and Mining Journal by Herbert Lang.

The smelting works at Keswick, California, were constructed upon the designs of the writer for the purpose of reducing the ores of the Iron Mountain mine, one of the great copper deposits of the world, and the property of a foreign corporation. The works, of which but a small portion have thus far been erected, consist of a smelting house enclosing a single blast furnace, a two-story frame structure occupied as a store and general office, another similar structure serving as assay office, a boiler and engine-house containing a temporary and insufficient power plant, two crushing houses containing three rock breakers and some small sampling machinery, and finally some few small buildings used as stables, carpenter and blacksmith shops, and a very good and fairly completed machine shop. The motive power throughout is electricity, which is generated by a central dynamo from which wires radiate to different parts of the works and actuate the different motors about the establishment. The voltage used is 110, which is very suitable for the different purposes of light and power, and will prove exceedingly convenient, as the system is the continuous one, for the electrolytic deposition of copper, which is the final step in the plan of reduction. The electric transmission of power admits of placing the different machines at sufficient distances apart to insure safety against fire, which is an important object. Other advantages might be named, but will readily occur to the reader. Regarding this feature it seems to the writer that the limited experience had with this form of transmission sufficiently demonstrates its advantages over all other methods, and from this view there is likely to be no dissent.

An important innovation practised at Keswick is the use of the single level instead of the terrace arrangement. The smelter, the ore floors, the crushers and all sit upon the same level. Upon this level (which comprises several acres) the ore is received, crushed (when necessary) and sampled, and the charges are weighed out. They are then hoisted by means of a hydraulic elevator up to the feed floor of the furnace, 14 ft. above, and fed into the shaft. The arrangements for receiving the ore from the Iron Mountain mine are very effective. It is brought in small cars holding 10 tons each, running on a 3-ft. gage track, the track resting upon a 20-ft. trestle in the rear of the proposed line of furnaces, and is then dumped through drop-bottoms on to the ground. These ores do not require crushing, but are fed directly into the furnace as they come from the mine. Four diverging railway tracks, which unite near the upper end of the smelter site, connect all parts of the works, and make the whole a model of convenience and accessibility. At present it is impossible to speak with the voice of experience about the relative advantages of the one-level plan of construction, but thus far, in the smelting of a few thousand tons, it seems faultless. Electricity, hydraulic power and the one-level system make a combination that is hard to beat.

The original design included the use of the bed, or rather canyon, of the neighboring creek as a slag dump, the idea being to extend the dump down the stream, according to requirements, after the immediate smelter site was suitably leveled up. But by an oversight, frequent in such cases, the proposed dump was occupied, first, to a large extent by a railway grade, and second by an adverse placer mining claim, which is an awkward contingency, and likely to give rise to accusations of imbecility on the part of the designer, if not seasonably explained. The ground, however, is not indispensable, since there is ample water in the creek to granulate the slag should it be desired, or other dispositions may be made of it.

The scheme of work which was outlined by the writer in reports to the company consists in three principal operations, to wit:

1. Pyritic smelting.
2. Air conversion of the matte (Bessemizing).
3. Electrolytic refining.

This plan harmonizes well with the conditions at Keswick, where ore is abundant, and, in fact, almost inexhaustible; where power derived from water can be cheaply had, and where fuel is comparatively expensive, coke costing about \$12 per ton and wood nearly \$3 per cord.

The ores of the Iron Mountain mine are of two sorts, namely, oxides and sulphides. The oxides are composed principally of ferric oxide containing as impurities a small quantity of silica and alumina, together with copper, to a very small percentage. Analysis of trial lots afforded:

Sulphur.....	13.41	2.49
Iron in Fe ₂ O ₃	11.40	2.09
Ferric oxide.....	48.22	70.88
Zinc.....	.74	0.21
Silica.....	9.45	8.57
Alumina.....	.60	1.39
Water (by riff).....	14.00	13.43

The oxides carry copper to a small per cent., their main values being in silver and gold, of which they contain several dollars per ton.

The sulphides are richer in copper and poorer in gold and silver than the oxides, running as high as 10% copper in some parts of the mine. I do not feel at liberty to mention the exact values in either metal, and will merely say that the sulphides treated thus far carried from 3 to 7½% of copper. The following analysis shows the composition of one lot of 754 tons which has been smelted:

THE SULPHIDES.	
Sulphur.....	45.66%
Iron.....	36.97
Zinc.....	3.41
Silica.....	5.80
Alumina.....	1.57

With ores so eminently basic of course a good deal of silica is necessary in order to form a proper slag. This is supplied in part by the purchase of gold-bearing quartz from the neighboring mines, which are very numerous; and in part by the use of barren silica mined on the company's own ground.

THE SMELTING PLANT.

The smelting furnace is a combination of water-jacket and brick stack. The shaft is prismatic in form, being 15 ft. long, 3 ft. wide, and 8½ ft. deep to the bottom of the jackets, and a foot less to the tuyeres. Such a

depth is unnecessary in pyritic smelting, but was adopted in order to admit of using the furnace for plain matting (German System) if such use should prove desirable. A depth of 5 ft. to the tuyeres would be more convenient for the former purpose. The walls are vertical—a valuable peculiarity in this form of smelting. The brick work encloses and is protected from corrosion by vertical pipes spaced 7 in. apart, which rise from the jackets to a height of 3 ft., taking their cooling water from below and discharging it through outward bends into a trough along the sides of the furnace. The quantity of water required for cooling is very small, while the protection to the walls is as perfect as need be. Jackets of this form proving expensive on account of their great length, the writer has devised an improvement consisting of replaceable cast-iron jackets protecting the region about the tuyeres, and covering a slightly greater area than those exhibited, whereby the necessity of the concealed pipes is obviated. The top of the furnace is open, and the fumes are taken off by means of a swinging flue which admits of access to any part of the shaft, while securing most perfect draft. The hood may cover the feed hole, or it may be removed to a distance of several feet therefrom and out of the way of the men engaged in working the furnace. Dust hoppers are interposed between the flue and the smokestack, serving to catch the coarsest of the flue dusts, of which about two-thirds of 1% was saved, although the provision for this important work is not by any means complete. The roominess of the plant excites favorable comment, particularly the feed floor, which is about 30 ft. square, contrasting favorably with the cramped space usually devoted to the purpose. The furnace is served by two hydraulic elevators, whose rams have a diameter of 8 in. and work under a pressure of 250 ft. of water, thus giving a lift of nearly 5,000 lbs. They are placed side by side, in the open space between the furnace and the weigher's office, with a common platform scale sunk into the floor on either hand. The furnace is fed in half charges of about 4,000 lbs. each, which is at present weighed in barrows. The provision for supplying heated air for the blast will doubtless prove interesting to smelting men. In front of the furnace on the slag floor there is a 3-ft. gauge railway track, upon which run large four-wheeled slag pots holding 1,500 lbs. each. Over the track, beginning at a point near the corner of the furnace structure, an arch of brickwork is built, this arch being some 90 ft. in length and extending well out upon the slag dump. The arch is 17 ft. high at the end next the furnace and about 5 ft. at the far end. A door closes it at the furnace end, while it is open at the other. The cars, being filled with slag at the furnace, are drawn through the door into the arched space and heat the air therein by radiation as they travel toward the dump, the hot air rising to the top and being drawn upon for the heated blast. The furnace is blown by a Sturtevant exhaust fan, an apparatus not perfectly adapted to the purpose, but the best which could at that time be procured. The temperature thus attained by the blast is not far from 500° Fahr., which proved sufficient for the purpose.

The blower is driven by an electric motor, which receives its current from the 40-kilowatt generator, which is, in turn, driven by the steam-engine. Neither engine, generator or motor proved capable of doing the work expected, and the smelting business suffered from the deficiency in no small degree. Fully 60 H. P. should have been provided for blowing such a huge furnace; while from the imperfections of the motive machinery only about half that could be had. The practical lesson derived therefrom is that, in installing motors for continuous work such as this, the nominal power should be largely in excess of any possible demands. The margin of safety, to use an engineering expression, should be two to one, or at least three to two. There are nine or ten changes of speed provided for by means of a governing rheostat interposed in the field coils of the motor, besides which a number of different sized pulleys permit of varying the air pressure and volume within rather wide limits. As a whole, the blowing apparatus worked well, with the exception of the lack of driving power. The novelty consists in blowing heated air instead of cold air, which would be heated after its passage of the blower, the air passing first the heating apparatus, second the blower, third the furnace; while ordinarily the blower comes first, the heating apparatus second, the furnace third. There are such a number of related principles entering into the subject that their discussion at this point would swell this brief account unduly, wherefore the writer prefers to lay aside its discussion for the present, taking it up in the abstract whenever time serves. Meanwhile, he would suggest to the metallurgical student to give thought to such cognate matters as the power required to blow hot as compared with cold air; the expansion of gases with given increments of heat; the specific heat of copper slags, and of air and the waste gases, etc. It is an objection to this arrangement that it takes more power to blow the furnace than when cold air passes the blower; and there is an advantage, although a doubtful one, in that the friction of the air is less in the heating chamber and the roomy induction pipes than it is in the customary iron pipe stove hitherto used for the production of a hot blast. The efficiency of the apparatus seems to be about 50%, regarded as a heating device, this low figure resulting from the crude form and construction incident to a first attempt. Thicker walls, a lower arch and better insulation will prevent the disproportionate loss of heat, while obvious improvements will be made in the mode of propelling the cars, which is now performed by means of a hydraulic jack lying beneath the track upon which the cars move, and connected with them by means of a wire rope. This portion of the mechanism was ill designed and has given much trouble, causing many suspensions of the work for repairs.

Slag and matte are tapped periodically into a large settling basin mounted on wheels and running upon the before-mentioned track. The basin holds some two tons or thereabouts, and is designed to assist the separation of the two products. The slag is next poured from the basin into a pot, when the matte, with whatever slag remains, is turned into another pot, or into a small hand pot on the opposite side of the basin. The basin, being movable, may be run under any one of four slag spouts, and the furnace thus tapped wherever its condition may demand. The idea is that such a long furnace is likely to work badly at some particular point, accumulating crusts in the ends, for instance, when, if the tapping hole is removed to that point, the obstruction may be melted out. For the same reason long modern lead furnaces are sometimes tapped from both ends. Also the bottom plates of the Keswick furnace sometimes got too hot, in the neighborhood of the tap which was being used, when the foreman would cause another tap hole to be opened to give the first

a chance to get cool. This elaborate arrangement of tipping fore-hearth running upon wheels had its rise in the assumed fact that the specific gravities of slag and matte would be so nearly alike that their separation would perhaps prove imperfect. The original calculation assumed that the slag falling from ores of the composition shown by the earlier analyses would possess a specific gravity of nearly four. But the ores proved to contain more of such impurities, as alumina, etc., than had been shown, and these impurities, taken in conjunction with the fact, overlooked at first, of the siliceous flux (gold quartz) carrying also quite a proportion of clay and other natural silicates, produced a slag having a considerably less gravity than was counted on, the average being but three and three-quarters instead of four, which rendered the separation less difficult than was anticipated. So that the tilting basin became from this point of view less essential than it promised to be. The separation is as perfect as it is possible for it ever to be in matte smelting, and there is no doubt that the ordinary forehearth with continuous flow will give so good results as to render the tilting hearth unnecessary. The objections to the latter as compared with the ordinary form are the extra labor entailed in tapping, and the care of the apparatus, but chiefly the impossibility of pouring the slag off from the matte without leaving a quantity of slag, or accidentally pouring over a quantity of matte, which entails much sorting and cost of labor. Although the periodic tapping and the resulting tumultuous flow of slag and matte establish a very perfect separation, still the device is not to be imitated unless the densities of the products are more nearly identical than is usually found. The continuous flow and the ordinary forehearth are far preferable, although lacking the facility of movement from one slag tap to another.

The unfinished condition of the works compels the handling of the cakes of slag and matte as they issue from the far end of the heating arch by hand with a great waste of manual labor, whereby the cost is considerably increased. Some seven men are employed uselessly in doing what might be done as well by machinery at little or to cost. However, such defects are easily remedied.

Experience shows the justice of the writer's contention that pyritic smelting succeeds best where the more fusible slags are produced. Of all slags, that composed of proto-silicate of iron runs the best and gives, as far as the writer's experience goes, the largest tonnage. And, speaking generally, the nearer a slag approaches that composition the more favorable it is to this form of smelting. Exceptions might be taken to this dictum in case that the specific gravity of such a slag were to interfere with separation of the matte. As a rule the farther the slag type diverges from this composition the harder it melts, the slower the furnace works, and the less satisfactory does the work become. The introduction of clay (and other aluminous compounds in a less degree) is quite prejudicial; while magnesia in the form of silicate (talc) was even more so. Quartz flux containing these substances to a noticeable extent is very injurious to the smelting, diminishing the rate of concentration (which depends upon the available silica), and decreasing the fusibility of the charge to quite an extent. It has been recommended by other metallurgical writers to use as acid flux such natural silicates as clay slate, burnt red brick, diorite rock, and similar substances under the presumption that they, containing combined silica, would fuse with bases with greater facility than plain quartz; but the writer, speaking from experience not only at Keswick but elsewhere, finds it necessary to dissent from this view. His impression is that clean white quartz, or an equally pure sandstone or quartzite, is the proper flux to take up the bases, particularly the protoxide of iron. Furthermore, while the quite highly aluminous slags can be melted in the pyritic furnace, the unnecessary introduction of alumina into the charge is to be avoided. It has been held by some that the presence of lime in the slags is essential in pyritic work. Limestone does indeed act as a diluting agent, preventing the coalescence of the descending charges, and for some unknown reason the presence of lime is found to assist in an important manner the concentration of the matte. But the introduction of this base into the mixture at Keswick, where the excess of base is already so pronounced, would compel the addition of an increased amount of silica and in so far disturb the economy of the work, probably to a greater extent than the advantages to be gained would justify.

The actual work of smelting presented a good many difficulties, particularly at the inception of operations, these being due to a variety of causes, among others the unfamiliarity with ores of this sort. The strongly decrepitating nature of the sulphides formed the greatest obstacle to effective concentration, provision for a blast adequate to deal with the closely packed charge not having been made. Those who have had no experience in this kind of smelting can have no conception of the readiness with which such sulphides burst to pieces and settle down in the interstices of the charge, impeding the blast and lessening the amount smelted. Sulphides that are naturally fine grained, but which do not decrepitate, do not give nearly the trouble that is experienced with material, even the coarsest, which decrepitates on the application of heat. In a case of this kind, where a stronger blast is not available, it becomes necessary to feed along with the offending material a large proportion of non-decrepitating substances, like oxidized ore, slag, limestone, matte, etc., which will act to dilute the charge and render it so porous that the wind is enabled to penetrate the mass. The writer is in the habit of using wood for the same purpose. At Keswick much matte is used for the same end, together with quite a large proportion of slag and also some wood, the latter as much in weight as the coke, at times.

The multiplicity of novel devices about the works rendered the starting somewhat difficult and tedious, the furnace crew requiring a considerable time for their breaking in, during which period a good many accidents and stoppages occurred, of which the record would not be instructive.

(To be continued.)

Japanese Shipping Enterprise.—The Nippon Yusen Kaisha, the largest steamship company of Japan, recently decided to increase its capital from 8,000,000 to 10,000,000 yen, equal to about the same number of Mexican dollars. It is proposed to extend existing lines and to open new, including one across the Pacific to Puget Sound. Mr. Iwanga, the representative of the company, is said to be delegated to close a contract with the Great Northern Railway, Seattle to be the American terminus.

"LA BRILLADORA" MINE, JALISCO, MEXICO.

Written for the Engineering and Mining Journal by James L. Baskett.

This mine is located about 150 miles in a southwesterly direction from Guadalajara and 10 miles from Union de Tula, and has an elevation of over 5,000 ft. The mine is reached by stage from Guadalajara to Ameca and from Ameca to Brilladora by mule back over one of the roughest mountain trails in the country.

The earliest history at hand is that the mine was known and worked by the Spaniards about 1736, as a gold mine, and was known as the "Bank of Gold" and "Brilladora," the latter meaning brilliant gold. Next it was worked by a priest until 1869, when it was abandoned and allowed to lie idle until 1892, at which time it came into the possession of a Mexican. It was purchased from him by some New York parties about a year ago and has since been continuously worked as a close corporation.

They found that the old Spanish workings extended to a depth of some 200 ft. and that all rich ore had been extracted to that depth in evidence of which is a dump of several thousand tons, twenty samples of which, just assayed, averaged $1\frac{1}{2}$ oz. gold and 6 oz. silver. This grade of ore will pay the present owners a handsome profit, but it seems the Spaniards did not consider it worth working. The upper portions of the old workings were found to be badly caved and required new timbers, and it is only within the last month that the lowest workings were reached and mining in virgin ground begun. The width of the vein, as exposed by the new shaft is between 3 and 6 ft., but portions of the old workings show the vein to be in places 18 and 20 ft. wide.

The hoisting works consist of a native, a rawhide bag and a notched pole. The natives strap this bag to their head and carry out from 200 to

ditch, the mill and all buildings were built and ready to operate within 60 days from the time of beginning construction. All work was done by natives, under an American fore-man. The machinery weighed nearly 100,000 lbs. and was all transported on mule back, eight days' journey from railroad.

Boards, etc., are very scarce and can be obtained in only one size; 1 in. \times 15 in. \times 6 ft., and these are brought in by mules a distance of three days' journey.

The largest timbers obtainable are 5 in. \times 7 in. \times 18 ft., and these are so warped and twisted that they would be considered worthless in the United States, still the mill and cre bin, capacity 200 tons, is built of them.

The mine is situated about one mile from the mill, and the ore is now transported on mule back, but it is the intention of the company to erect a wire rope tramway when the large mill is built. This is, one might say, a new district, and several large syndicates have lately had representatives through this country, and one of the large smelting companies has established an assay office and ore purchasing agency at Ameca. The Mexican Central Railroad has its line almost completed to Ameca, and it is expected that within 90 days the stage line from Guadalajara to that point will be a thing of the past.

SEPIOLITE.

Written for the Engineering and Mining Journal by R. Helmhaecker.

The two minerals kaolin and serpentine have a peculiarity due to the result of decomposition, the first of aluminous, the latter of magnesian minerals. They are, as the last result of decomposition on a large scale,



PLANT OF THE BRILLADORA GOLD MINING COMPANY, UNION DE TULA, JALISCO, MEX.

300 lbs. a trip, going up these poles like so many monkeys. A man will make 25 trips a day and receives as wages for 10 hours' work 37c. Mexican money, which is about 20c. in American coin. Miners receive 50c. per day of 10 hours.

The ground is soft and little or no powder is required and the shaft is going down at the rate of $3\frac{1}{2}$ ft. every 24 hours.

The company has just erected a small mill to be used as an experimental plant, it being their intention to erect a 60-stamp mill, or a plant of that capacity, as soon as they have demonstrated the best mode of treatment.

The present plant was furnished by Messrs. Fraser & Chalmers, Chicago, and consists of two $3\frac{1}{2}$ -ft. Huntington mills, two 4×10 ft. plates and three 4-ft. Frue vanners. The power is furnished by a Pelton water wheel and the water is obtained from the Aguila River, a stream that is capable of furnishing 1,000 H. P. The capacity of the mill is 25 tons every 24 hours. Water to supply the mill is conveyed by ditch a distance of 3,100 ft., which gives at the mill a fall of 60 ft. This ditch is 15 in. deep, 28 in. wide on the bottom and 36 in. at the top. It is built mostly of brick, the size of each being $11 \times 17 \times 4$ in., and 28,000 of these were used in the construction. It is interesting to note that this

distinguished by their non-ability to disintegrate further. True as that assertion may be for koalinite, serpentine, a metamorphic rock, resulting from the alteration of other rocks composed of olivine, pyroxene, amphibole, or of rocks of sedimentary tuffic origin, shows a tendency to further decomposition. Under exposure to ordinary atmospheric influences, an outcrop of serpentine becomes altered through absorption of oxygen, but below the surface it is disintegrated. In most cases, however, serpentine rock is altered on its surface to a brittle mass of angular fragments, after which it becomes decomposed to a half-decayed somewhat clay-like substance, mixed with fragments of altered rock. The decomposed serpentine with the rotten earth, like product of its weathering, shows a more faded color, and the rock itself, as well as the half-decomposed disintegrated matter, are contaminated in places by masses of secondary minerals, created by the decomposition of the primary rock. These new formed minerals are: Opal, associated with crypto-crystalline varieties, as flint, chalcedony and cacholong, representing mixtures of opal with quartz. There are represented all gradations between the opal and the flint, also talc and associations of mixtures of talc with chlorite-like scales. Compact magnesite, gymnite and other minerals do not occur so frequently. The compact magnesite is also

very often impregnated with silica, and between the opal and the compact magnesite there are intermediate varieties. Even the purer varieties of magnesia-carbonate contain some silica as well. The other minerals accompanying the magnesite, but of rare occurrence, are the green description of gymnite with a nickel silicate named nickel-gymnite, garnierite, texasite; amphibol-asbestos—named asbestos leather, and others.

The compact magnesite occurs in the outcropping serpentine rock, filling-out crevices and sometimes forming a meshwork. Stringers of white magnesite intermingled sometimes with fragments of half-decomposed and totally decayed serpentine disappear entirely toward the lower portions of less altered serpentine.

But in the case, when the outcrop of the altered, faded serpentine-rock, consisting of a layer of earthy-disintegrated serpentine, is again covered with a clay-like vegetable earth or soil—also with a cover of an earthy deposit named eluvium, that proceeded from the decomposition of the underlying rock—then other chemical processes took place. At the bottom of these eluvial deposits, there is a horizon, immediately covering the rotten, decayed outcrop of serpentine, remarkable by the number of irregular nodular concretions of massive magnesite, of silicified magnesite, opal and fruit-like minerals, and also of sepiolite. The irregular, loosely imbedded mineral varying in size from a small lump to masses much larger than a head, appear, when consisting of magnesite, with an irregular or grape-like surface slightly covered with clay. Though the sepiolite occurs in similar masses to the magnesite, the external character of the imbedded sepiolite concretions are not like the latter; for when first taken out, they form doughish-soft bunches of large size, heavily covered by a coating of clay. These masses are cleaned of the muddy impurities, and the grayish-white soft matter becomes more coherent, by losing a part of its moisture by evaporation. When the ill-looking masses are cleaned and scraped superficially, they show a white or yellowish-white or pale gray-

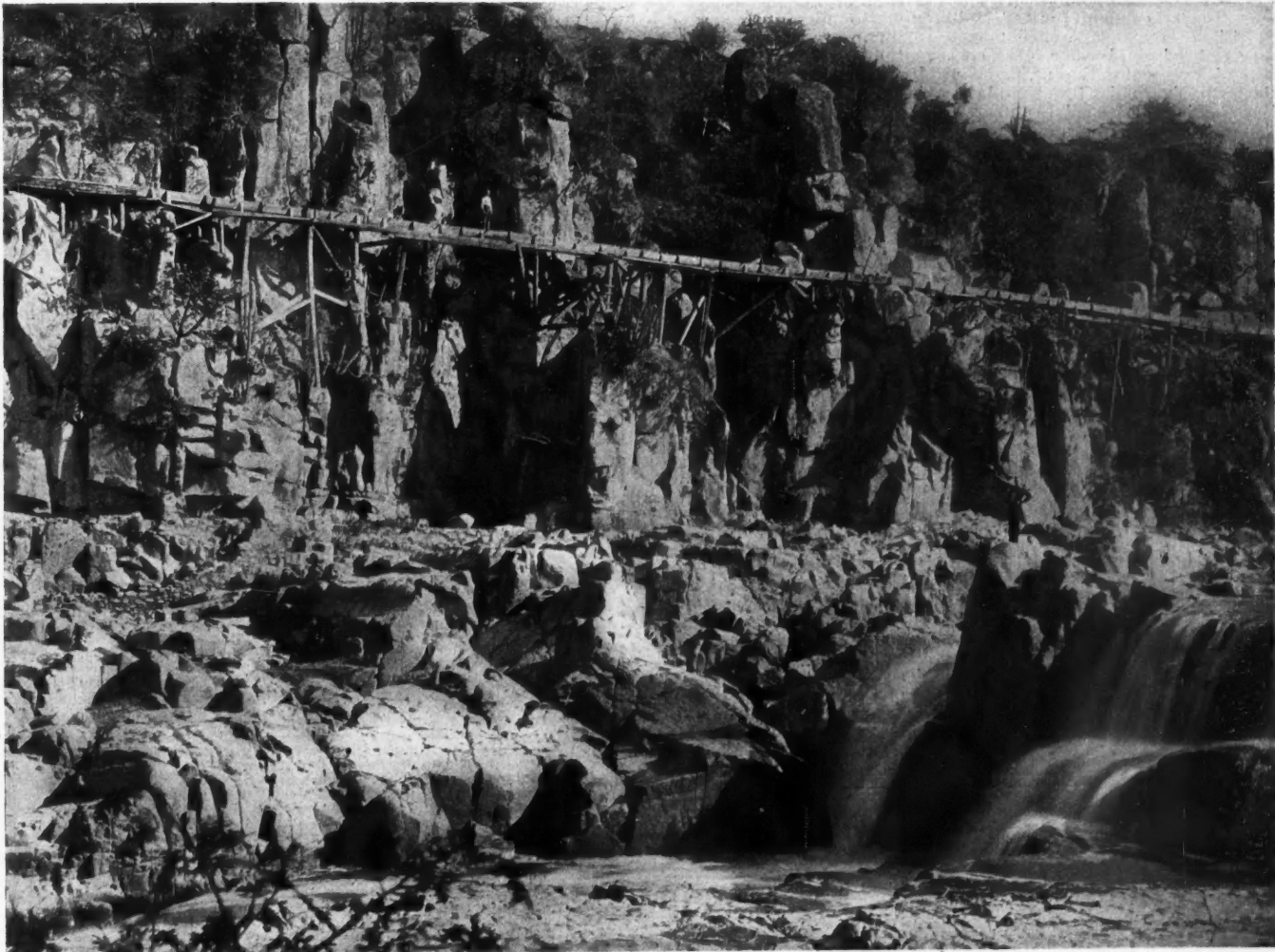
lian language this mineral bears the name "myrsen," also "myrsen." one is inclined to think that the German denomination meerschaum is derived from the Asiatic name. The scientific name sepiolite is derived from sepia or cuttlefish, the skeleton of which, the cuttlefish bone, is equally light and porous.

The mineral which has proceeded from the decomposition of serpentine as well as the magnesite and opal with which it is found together, is imbedded in a certain layer over the entirely disintegrated serpentine rock. Considering these circumstances, sepiolite, as it occurs, is often mixed with the carbonate of magnesia, silica and clay, all of these formed at once; giving upon analysis a different chemical constitution, becoming non-secile, losing softness and luster, and proving of lesser commercial value. Apart from the chemical impregnations with magnesite, opal, the white mineral is often clouded with gray, mechanically distributed impurities of clay, or intersected by thin veins or nodular spots of flint, and from these defects is unmarketable.

From a chemical point of view two general classes of sepiolite are recognized: the sepiolite of the chemical composition of $2 \text{MgO} \cdot 3 \text{SiO}_2 + 2 \text{H}_2\text{O}$ in deposits, reference to which has already been made, occurring in perfectly decomposed serpentine-rock covered with a layer of an earthy serpentine-eluvium, and a mineral of the chemical constitution $2 \text{MgO}_2 \cdot \text{SiO}_2 + 4 \text{H}_2\text{O}$, quite similar to the first.

The former sepiolite occurs only to a limited extent in Europe. Let us now consider those different areas a little more in detail. Deposits of sepiolite over decomposed serpentine rock may be expected to be found only where a considerable eluvial cover is superimposed.

Near Hrubshitz and Biskoupka in Moravia, on the Tihlowka River in a northwestern direction from Krumov, there is a large body of serpentine, derived from olivine rock, existing under the serpentine outcrop. The eruptive olivine rock breaks as a large body through gneiss, granitic



FLUME OF LA BRILLADORA GOLD MINING COMPANY, UNION DE TULA, JALISCO, MEX.

ish-white color, an earthy pretty even fracture with very little or no luster like unglazed porcelain, and the fractured part adheres to the tongue, because microscopically porous. Besides this, the mineral is perfectly sectile.

The mineral when pure has a composition corresponding to $\text{SiO}_2 = 60.8$, $\text{MgO} = 27.1$, $\text{H}_2\text{O} = 12.1$ or $2 \text{MgO} \cdot 3 \text{SiO}_2 + 2 \text{H}_2\text{O} = \text{Mg}_2 \text{Si}_3 \text{O}_8 + 2 \text{H}_2\text{O}$. The white mineral, when not perfectly pure, appears grayish white, also with a yellowish or reddish tinge when somewhat mixed with impurities. The compact matter is smooth to the touch, of a very fine earthen texture, impressible by the nail, even plastic when freshly extracted. Dry masses of sepiolite float on water, and that is, as is generally supposed, the reason for the German name of the mineral "meerschaum" meaning "sea foam," even alluding to its lightness and white color. But this explanation of the German denomination is totally wrong in my opinion for the following reasons: The most important sepiolite fields are known in Asia Minor, where, near Brusca and Kichik in Natolia, the first explorings were executed. As in the Nat-

gneiss and mica-schist gneiss, pushing up and disturbing in some places the immediately surrounding strata, and also including great masses of the Laurentian gneisses. On the higher elevated areas, where the olivine serpentine rock appears, not eroded by the river valley and its gulches, the sepiolite, associated with magnesite, opal, cacholong, etc., there is to be found imbedded in the lower bed of the eluvial covering, overlying the decomposed rock. But the nodular concretions of the sepiolite are mixed with magnesite, spotted with clay and intersected by small fissures of flint. It is mined by short drifts, also by scattered, irregular open pits, sunk upon the bed, containing the minerals of decomposition to a depth of several meters; but only the magnesite is valuable as mineral, being extracted to supply the soda-water manufacturers. The dull white sepiolite has but a mineralogical interest, being unfit for pipe carving.

A more important deposit occurs in Bosnia. In the cretaceous series, consisting of barren sandstones, conglomerates, shales, but not in the typical formation with fossils (fish), these are known in mine sheets

or enormous beds of serpentine rock dipping slightly to the N. N. W., and striking accordingly with the sedimentary beds. The serpentine, sometimes bedded, is probably a metamorphic rock associated with gabbros. In places there are found in the lower parts of the eluvium, covering the decomposed serpentine rock, nodules of magnesite, and where the eluvium presents itself with great thickness, also sepiolite occurs. This takes place on the northwestern flanks of the Ljubichplauina (plain) easterly from Banjaluka. The sepiolite is obtained from Reljevatz and Brane-shitz under similar conditions as in Moravia. Irregular scattered shafts sink on this place, where the decomposed serpentine rock is overhung with a thick eluvial layer, struck the deposits of sepiolite, magnesite, opal, etc. The samples extracted from this place are purer than those of Moravia; but contain also in the purest varieties still about 4% impregnations of magnesia carbonate and silica. The first sepiolite was extracted in the year 1860 to the extent of 200 tons, and in bringing it to Vienna it was thought possible that these samples might prove of value, but the results were not favorable. At present the mineral is again extracted, and though not of excellent quality it finds a market among the pipe-carvers in Vienna.

Sepiolite is also found near Thebeui, Greece, in similar beds covering the serpentine rock. The lumps consist sometimes of opal, showing a rich sepiolite coating, graduating by an intermediate variety into the center portion of opal. There is also a similar deposit on Negroponte. The most remarkable deposit showing the same features already mentioned is near Eskishehir. The bed with minerals of high workable quality is overlying the decomposed serpentine-rock. The location, where the mineral is mined is southerly from Eskishehir, about eight miles to Sepedu, Sarisu Odeak and Kenukli. In this important field the industry is worked, through about 4,000 pits, sunk from 10 to 70 m. in depth, from the surface to the mineral-bearing bed, and more than 1,000 hands are employed during a time when there is no rural or other occupation for them. The large quantity mined and brought to mine surface is also soft. These large, clay-coated masses are lumps twice, even thrice as large as a head, and become more consistent on exposure. The entire product is exported to Europe, namely to Vienna and Prague, Austria, Ruhla in the Thuringian forest and Leungo in Westphalia, Germany, where it is carved into tobacco pipes and cigar mouthpieces.

The sepiolite admits of a high polish, and may be turned in a lathe. Several thousand persons are employed in these manufactures. In former time this valuable mineral, after having been thoroughly crushed in water, was deposited in bags beneath earth, where a fermentation took place, and it was recognized, or at least it was thought to be recognized, that the product thus prepared had undergone a stage of improvement, though the cause still remained undiscovered. The mineral is classified in about 10 qualities. In rubbing the cleaned surface of the sufficiently solid samples with the palm of the hand they become smooth and lustrous; by the grade of lustre thus acquired they are classified into choice or common quality.

As everything promising an income, without employment of labor or skill, in the Turkish Empire belongs to the government, or more precisely to the agents or state officials, so also in this case the officials, under the cover of the government, collect a tax of one-sixth of the value of the production. There are about 420 adventurers that pay the government royalty of 50,000 francs yearly; but the lessors have leased their claims of this important deposit to small sub-lessees, and it is reported they receive a yearly income of 210,000 francs from them.

The other variety of sepiolite mentioned showing the chemical composition of $Mg_2Si_4O_{10} + 4H_2O$ corresponding to $MgO = 23.8$, $SiO_2 = 54.9$, $H_2O = 21.4$ is also associated with nodular concretions of caccholong, an intermediate variety so called, between opal and chalcedony and flint. But the mineral forms a stratified deposit in marls and sand-marl, associated with Tertiary tuffas of serpentine in France, Spain and Morocco. It occurs near Coulommiers, in France; at Vallacas, near Madrid, and Cabanos, near Toledo, in beds, lying nearly horizontal, though showing local crumplings. The extensive Spanish beds of dull greyish color, consist of a mineral, by no means as sectile as the true sepiolite, affording a light but valuable building stone. The mineral from Morocco is brownish, because mixed with impurities containing oxide of iron, but feels very smooth and has a half-clay like texture, wherefore it is used in place of soap at the Moorish baths in different places in Algeria, where it is called in French, "Pierre de Savon de Maroc," which means soap-stone of Morocco.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

MINING CLAIMS.—In a recent case a party asked the court to instruct the jury that, to constitute a valid location of a lode-mining claim, it was not necessary that a vein or lode of mineral rock in place should be discovered within the limits of the claim attempted to be located, but that a valid location might be made, if in other respects complying with the law, if the discovery of a vein is made by the locator upon an adjoining location owned by him and others, which vein, if maintaining the same strike as at the point of discovery, would pass into the claim attempted to be located, although, as a matter of fact, the vein is not traced, or shown to have passed, into the latter location. The court said: This contention is based upon a supposed analogy existing between annual assessment work, which may, in certain circumstances, be done outside the claim, and a valid discovery, which is a condition precedent to a valid location in the first instance. But this contention is contrary to all previous announcements upon this subject, and finds no support in the Federal or State statutes, and, in the absence of a decision by the Supreme Court of the United States to that effect, we decline to establish such a doctrine. The discovery must be within the limits of the claim located, and upon unappropriated territory.—*Michael vs. Mills* (45 Pacific Reporter, 429), Supreme Court of Colorado.

MECHANICS LIEN ON MINING PROPERTY IN CALIFORNIA.—Under the laws of California, giving mechanics' lien for labor done at the instance of the owner of a building or his agent, and further providing that "every contractor . . . or other person having charge of any mining or of the construction . . . of any building, or other improvement, as aforesaid,

shall be held to be the agent of the owner for the purposes of this chapter," proof that a person acted as superintendent of the property of a mining company incorporated in another State, and claimed to be such superintendent, and having charge of all the work done on the property, is sufficient to establish, prima facie, the agency of such person for the mining company.—*Donohoe vs. Trinity Consolidated Gold and Silver Mining Company* (45 Pacific Reporter, 259), Supreme Court of California.

UNAUTHORIZED CONTRACT.—Mine owners indebted to a bank made their note, and executed a deed of trust upon their mining property to the cashier of the bank, to secure the indebtedness. The note was not paid at maturity, and without the payment of any money to him or to the bank, and without authority, the cashier released the deed of trust, and two other papers were executed between the parties. One was an absolute deed of the property to the cashier; the other an agreement whereby he was to work the mines till the indebtedness of the bank was paid from the proceeds, and certain amounts paid to the mine owners, after which he was to become the absolute owner. Subsequently a creditor of the bank attached the mining property as belonging to the bank. The court held that under the second contract the cashier acquired no title, he having never complied with the conditions of the deed; and the bank could not be held to have adopted the contract of its cashier, since it must have done so in its entirety, and the agreement to operate the mines would have been *ultra vires*.—*Weston vs. Estey* (45 Pacific Reporter, 367), Supreme Court of Colorado.

LIABILITY OF MINE OWNERS TO TRESPASSERS.—Where a party, who was employed on the dump of a mine, was injured by rock and debris thrown down from another mine above by employees of the owner of the other mine, although the latter had permission to work the same in part through the property on which the injured party was engaged, the latter's negligence in working in an exposed place did not relieve the owner of the other mine from liability, if his employees, with full knowledge of such party's peril, willfully persisted in rolling the rock down upon the place where he was at work. And the fact that the injured party was a trespasser will not prevent a recovery for such willful and wanton injury.—*Hector Mining Company vs. Robertson* (45 Pacific Reporter, 406), Supreme Court of Colorado.

PATENTS RELATING TO MINING AND METALLURGY.

United States.

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

WEEK ENDING JULY 14TH, 1896.

- 563,733. **ORK MILL.** Samuel K. Behrend and Carl F. Weller, Washington, D. C. Filed September 5th, 1895. Combination of a layer of crushing-balls interposed between two parallel horizontal surfaces or plates, in such a manner as to be free to shift laterally and change their relative positions whenever they travel in irregular paths, and wear down uniformly to maintain their true spherical contour, in combination with means for actuating one of the plates, and devices for feeding and carrying off the ore.
- 563,769. **PROCESS OF DESILVERIZING LEAD BULLION.** William H. Howard, Pueblo, Colo. Filed July 27th, 1895. The process consists in subjecting the zinc crusts to pressure without the application of heat.
- 563,776. **MINING MACHINE.** James E. Lee, David A. Lee and Thomas F. Lee, Centerville, Ia. Filed August 19th, 1895. Combination of a cutter comprising a core and a continuous spirally-coiled band wound around the core and arranged flat against the same, and provided at its front edge with outwardly-projecting teeth, formed integral with the band and arranged at intervals at each coil thereof and lying beyond the outer face of the band, and provided with front cutting edges and having their rear edges convexly curved.
- 563,781. **COMBINED COKE DRAWING, CLEANING, SPRINKLING AND LOADING MACHINE.** John A. Montgomery, Birmingham, Ala. Assignor to Silas B. Mason, Lewisburg, W. Va. Filed August 10th, 1895. Combination of a movable supporting platform or car, the reciprocating and laterally-moving frame mounted thereon adapted to be inserted into an oven, the conveyor carried by the frame and the breaker or dozer located on the end of the frame for the purpose of loading the coke onto the conveyor, the conveyor adapted to continuously convey the coke from the oven.
- 563,805. **CONCENTRATOR.** William H. Rockefeller, Baker City, Ore. Filed August 1st, 1895. A concentrator comprising a table mounted to rock edwise about a longitudinal sub-jacent axis and provided with screening and amalgamating devices and an end discharge, a water-wheel journaled beneath the end discharge about an axis at right angles to that of the rocking table, and having a crank at its end with wrist-pin, a horizontal lever fulcrumed between its ends at the side of the machine upon a stationary part of the framework, and having one end connected to the rocking table by a vertical link, and the other end slotted and connected to the wrist-pin of the water-wheel crank.
- 563,806. **CONCENTRATOR AND AMALGAMATOR.** John B. Rossman, St. Paul, Minn. Filed September 17th, 1895. Combination of a concentrator and amalgamator having its bottom provided with fixed transverse dividing-strips and removable longitudinal dividing-strips, and openings in a side of the shaker between the transverse strips.
- 563,980. **ACETYLENE-GAS GENERATOR.** James H. Morley, Springfield, Mass., assignor of one-third to the Morley Acetylene Gas Company, Wheeling, W. Va. Filed October 24th, 1895. The combination with a suitable tank and water-sealed gas-receiver vertically movable within the tank, of a gas-generating chamber having pipe connection with the receiver, a water-reservoir located in a plane above the chamber and having pipe connection therewith, a valve having oscillating stem and governing the passage of water from the reservoir to the chamber, a lever projecting from one side of the valve-stem and provided with a bent portion, and a bracket upon the receiver loosely embracing the lever and pressing alternately against the opposite sides of such bent portion in the upward and downward movement of the receiver, to close and open the valve.

Great Britain.

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

WEEK ENDING JUNE 13TH, 1896.

- 10,356 of 1895. J. T. Key, Barnsley, England, and W. S. Key, Winthrop, Mass. In coke ovens, using false bottoms and perforated floors for the escape of oil and gas by-products.
- 10,671 of 1895. J. C. Hull and R. Legerwall, London, England. Improvements in white metal by adding a small proportion of mercury.
- 13,537 of 1895. M. Crawford, Colorado Springs, Colo. Precipitating gold from cyanide and chlorine solution by filtration through charcoal prepared with sulphate of aluminum or sulphate of iron.
- 3,246 of 1896. R. Neuss, Berlin, Germany. Igniting apparatus for miners' safety oil lamps.
- 8,072 of 1895. F. Raymond, Brussels, Belgium. Producing alkaline aluminates by treating sulphides of alkali metals with alumina, and producing sulphuretted hydrogen concurrently.

PERSONAL.

MR. JAMES F. BEATTIE has left McFerran, El Paso County, Colo., for Altman in the same State.

MR. HENRY BRATNOBER, the Montana mining expert, is in Salt Lake, where he will remain about a week.

MR. E. S. THURSTON, Mining Engineer, of New York City, has been at Leesburg, Idaho, on professional business.

MR. H. THOFERN has resigned as superintendent of the refinery of the Anaconda Company's works, at Anaconda, Mont.

MR. W. DE L. BENEDICT, mining engineer of New York, has sailed for Europe to attend to some professional business in London.

CAPTAIN EAKINS left New York this week for Gilt Edge, Mont., to take charge of the financial operations of the Ammon-Stivers Mining Company.

MR. JOHN C. F. RANDOLPH, mining engineer and metallurgist, of New York City, has been in Cripple Creek, Colo., looking over the mines of that district.

PROF. H. O. HOFMAN, of Boston, began a trip to the Black Hills, South Dakota, about July 14th, accompanied by several students, who will visit points of interest in that section.

MR. JAMES JONES, coal operator, of Monongahela City, Pa., and owner of the Ivill mines at that place, has gone abroad and will spend a few months in Wales visiting relatives.

COL. R. A. AMMON, president of the Ammon-Stivers Mining Company, incorporated, Gilt Edge, Mont., has just returned to New York from a business trip to the company's mines.

MR. CHARLES M. ROLKER, mining engineer of London, connected with the Mining and Financial Trust Syndicate, is at present examining Mr. DELAMAR's mineral property in Nevada.

MR. TIMOTHY W. SPRAGUE, consulting engineer, is in West Virginia, at the mines of the Davis Coal and Coke Company, where he is supervising the installation of an extensive electric plant.

PROF. W. JONES, metallurgist and chemist, late Superintendent Refining Department, C. K. C. S. & R. Co., Argentine, Kan., has opened an office at northeast corner Riverside and Howard streets, Spokane, Wash.

MR. R. N. DICKMAN, of Dickman & Mackenzie, has gone to La Plata City, Colo., to examine some property in the interest of Eastern capital. He will visit Prescott, Ariz., on similar business, before his return to Chicago.

MR. P. WILLIAMS, manager of the Brymbo Steel Works of North Wales, sailed July 15th. Mr. WILLIAMS came out to inspect and report on the working of the Davis-Colby ore roasters and for this purpose visited Shelby and Bessemer, Ala.

MR. CYRUS ROBINSON, engineer and manager of the mining department of the Jeffrey Manufacturing Company, of Columbus, O., has resigned his position to accept the management of the J. H. McEwen Company, with headquarters in New York City.

CAPTAIN J. W. PLUMMER has sailed for Europe, and it is understood that he will not return for some time. He will in the future have general supervision over the DeLamar Company's many mining interests throughout the world, with headquarters in London.

LIEUT. HUGH RODMAN, U. S. N., has been detailed to make a tour of inspection in Alaska in connection with the international boundary line between Alaska and British America. He will cooperate with the Superintendent of the U. S. Coast Survey.

MR. CHARLES B. WILDER, manager of the Moose mine, Cripple Creek District, Colo., has been appointed superintendent of the C. O. D. mine, to succeed Mr. Harry Leonard, resigned. Mr. Wilder continues his relations with the Moose the same as formerly.

MR. HENRY JANIN, mining engineer, formerly of New York, but now of London, England, has been examining mineral properties in Mexico for several weeks in the interest of English capitalists. He returned to London the 18th inst., on the steamship "Campania."

OBITUARY.

JOHN N. GAMEWELL, inventor of the electric fire-alarm system bearing his name, died at Hackensack, N. J., July 19th, of heart disease. He was born in Marlborough, N. C., 74 years ago.

The death of ALEXANDER G. STOLETOW, Professor of Physics in the University of Moscow, is announced. STOLETOW was born in 1839, and was educated at the Universities of Moscow, Heidelberg, Göttingen and Berlin, working from 1862-65 in the laboratories of KIRCHOFF and WEBER. He was appointed lecturer in physics in the University of Moscow in 1866, becoming professor in 1873. He was a member of the First Electrical Congress, held

in Paris in 1881, and was a member of the jury of the Paris Electrical Exhibition, held in the same year; he was also vice-president of the 1889 Electrical Congress.

SOCIETIES AND TECHNICAL SCHOOLS.

CIVIL ENGINEERS' CLUB OF CLEVELAND, O.—A meeting was held Tuesday evening, July 14th, 1896, at the rooms of the School Council, at which 82 members and visitors were present.

The paper of the evening, by Mr. H. F. J. Porter, of Chicago, was well illustrated by lantern slides of photographs and drawings. It gave an exhaustive description of the Bethlehem Iron Works at South Bethlehem, Pa., and their processes in the production of large forgings. The exhibition of photographic plates concluded with that of Mr. John Fritz, the founder of this great enterprise.

The speaker was followed by Messrs. Oldham and Newman, Dr. Langley and others in interesting remarks, and Mr. J. F. Holloway appropriately finished the topic with a glowing tribute to the worth and ability of Mr. Fritz.

INDUSTRIAL NOTES.

The Union Foundry and Manufacturing Company, Dayton, O., has been incorporated with a capital stock of \$50,000.

The Bethlehem Iron Company's rail mill, which has been idle several weeks, will resume work on Monday, July 27th for a short run.

It is rumored that Pittsburg and Cumberland capitalists have leased the Baltimore & Ohio rolling mill at Cumberland, Md., and will operate it shortly.

The Jefferson Steel and Manufacturing Company, Birmingham, Ala., is erecting a 15-ton Hawkins furnace for making steel and expects to build nine more later.

The General Electric Company has purchased the stock of the Southern Electrical Manufacturing & Supply Company, of New Orleans, La., and has succeeded to its business.

The General Electric Company has closed a contract with the Northwestern Electric Elevated Railroad, of Chicago, to supply it with the entire electric equipment of its rolling stock.

Governor Bushnell, of Ohio, has appointed a commission of five members to take steps for the improvement of the water supply of Cincinnati, with authority to expend \$6,500,000 in the work.

The Pennsylvania Steel Company, Steelton, Pa., is rebuilding its No. 1 blooming mill. The heating furnaces will be replaced by soaking pits, new cranes will be added, and other changes made.

Furnace No. 9 of the Thomas Iron Company, located at Island Park, Pa., after a run of 122 weeks has been blown out for repairs. Among other improvements a new boiler plant will be installed and the furnace relined.

The new Consolidated Phosphate Company's plant, at Fort Ogden, Fla., is running on full time day and night, and making regular shipments. The company works about 200 men, and will soon replace the wooden barges with iron ones.

After an interim of five years the shipment of iron from St. Jago de Cuba to the Carnegie Works, near Pittsburg, Pa., has been resumed via Locust Point. The Baltimore & Ohio Railroad Company will get a portion of this freighting business.

The Franklin Steel Casting Company, of Franklin, Pa., manufacturers of steel castings of all descriptions, is constructing an additional open-hearth furnace. The company is also building an addition to its machine shop, core room and No. 1 foundry.

The Penberthy Injector Company, of Detroit, Mich., will on July 25th, celebrate the event of the manufacture and sale of 100,000 Penberthy injectors, from June 5th, 1886, to May 12th, 1896. On that day they will give their employes a holiday and excursion to "Beauvoir," St. Clair River, and have invited their friends and customers to participate.

The Westinghouse Electric & Manufacturing Company has received an order from the Carnegie Steel Company, Limited, for a complete electrical equipment for the Duquesne Steel Works. The new equipment will furnish power for all light cranes, and it is expected that electricity will be employed also in driving the rolls. There will be 16 large dynamos at the start, and the installation will be made with a view to adding other dynamos.

The Edward P. Allis Company, of Milwaukee, Wis., has received an order in its mining department for the complete machinery of large new reduction works to be built in Colorado. This order includes engine, boilers, crushers, rolls, concentrators, chlorination barrels, etc. An order has been placed in the saw-mill department for the complete machinery of a mill to go to California, which will be one of the largest in the country. It includes the necessary engines and boilers. The Edward P. Allis Company is now also at work upon the remaining six of the twelve vertical compound condensing blowing engines for the Carnegie

Steel Company. The latter company reports that these machines already in service more than exceed the expectations of all concerned.

An order for a supply of aluminum plates has been received by the Pittsburg Reduction Company for use on United States warships, and the work of turning out the sheets is being rapidly pushed. The first three plates were rolled last week in the Spang Steel and Iron Company's plant, at Sharpsburg. One of the sheets measured 150 x 100 x 1/4 in., the largest plate of aluminum ever rolled in the world. The plates are to be converted into large kettles and pans, to be used in the culinary departments of the war vessels.

Bids were opened July 20th at the Japanese Legation in Washington, D. C., for two cruisers for the Japanese Navy. The Japanese Government has appropriated a large sum to be expended in the increase of its naval force, and part of this fund is destined for American shipbuilders. Bids were solicited from but two American concerns, the Cramps of Philadelphia and the Union Iron Works of San Francisco. The Messrs. Cramps were in attendance upon the opening of bids, which will not be made public, and which will be sent to Japan for examination and action. The bidders were allowed to follow their own plans to a large extent. The vessels bid upon are of the cruiser type and of about 5,000 tons displacement. It is specified that each shall have a speed of 22 1/2 knots.

TRADE CATALOGUES.

The Walker Company, Cleveland, O., have placed on the market a trolley which seeks to overcome a well-known difficulty—jumping off the wire—and illustrate and point out its advantages in a circular sent to us. No overhead switches are required, it has no lateral motion, and is ball bearing. The trolley pole can be reversed in the same manner as all other kinds. They also do an extensive business in the manufacture of electric railway generators, motors and controllers.

James Leffel & Co., Springfield, O., have sent us one of their new pamphlets illustrating and describing water wheels, more especially their new Cascade, which is an "impulse and reaction" type of wheel. Its advantages are simplicity of construction, slower speed (for many purposes), small frictional surface and freedom from wear. It is applicable to heads of water ranging from 40 ft. to 2,000 ft. and upward. With certain modifications it is possible to adapt this wheel in size so as to obtain almost any required speed, it being merely a matter of diameter, number of buckets and size of nozzle. The velocity of the wheel depends upon the head pressure, and the speed upon the diameter, therefore the number of revolutions is changed with every change in diameter of the wheel for the same head.

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 manufacturers in each line.

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

GENERAL MINING NEWS.

OIL PRODUCTION AND NEW WELLS.—According to Stowell's *Petroleum Reporter*, the average production of petroleum in the United States in June was 88,728 bbls. per day, giving a total of 2,661,840 bbls. for the month. Shipments for June are reported at 2,248,761 bbls. The stock on June 30th was 7,542,560 bbls.

There were completed in the New York, Pennsylvania and West Virginia oil fields during June 744 new wells with a daily production of 11,399 bbls., says the *Oil City Derrick*. The number of new wells drilling at the end of the month in this region was 1,061. The Buckeye field in Ohio shows a total of 513 new wells completed in June, with a daily production of 9,670 bbls., and that there were 440 new wells in progress. In the Southeastern Ohio field there were completed for the same period 49 new wells having a daily capacity of 426 bbls., and of 57 new wells under the drill at the close of June. The Indiana field records the completion of 150 new wells having a daily output of 3,115 bbls., and 136 new wells in progress at the end of the month.

ALASKA.

ALASKA-MEXICAN.—The new 60-stamp mill of this company is rapidly nearing completion, and will add materially to the bullion output of Douglas Island.

ALASKA-WILLOUGHBY COMPANY.—Arrangements are being made to commence some extensive development work on this company's claims at Funter Bay. Shafts are to be sunk in two or three different places, it being the intention to go down 200 ft., running a level at 100 ft. and also at the bottom of the

shaft. In each instance the sinking will be done on the ledge, the ore taken out being trammed direct to the mill.

JUNEAU MINING COMPANY.—The 30-stamp mill of this company, in the Basin, is now in full operation, running day and night on good ore.

NOWELL COMPANY.—Another strike is reported on Sheep Creek, in properties owned by this company, the ore assaying \$1,200 gold. Heretofore this district has been known as a silver-producing camp.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

DEL RAY MINE.—Mr. A. Mackintosh, of the Gold Mining Exchange, has brought down an interesting specimen of arsenical sulphurets taken from this mine. It runs right through a 4-ft. vein. At the surface it appeared the width of a knife blade and widens as depth is attained to 6 in., and assays from \$45. to \$100 a ton.

Development work only is now being done. The shaft is down 30 ft., and the ore taken out in sinking pays not only the expense of development work, but also leaves a handsome profit.

BUTTE COUNTY.

(From Our Special Correspondent.)

PRINCESS.—The report on this drift mine, $4\frac{1}{2}$ miles from Magalia, by Geo. E. Hogg, mining engineer for the Gold Mining Exchange of San Francisco, Cal., contains the following: "The property consists of 320 acres, United States Patent. A bond is also held by the company on 240 acres adjoining. The channel is reached by an incline 330 ft. long, the opening of which is in a ravine, through which flows the Little Butte Creek. At this point are located the hoisting and pumping works, arrastra, etc. At the bottom of the incline a drift running southwest has been extended and a number of crosscuts and lateral drifts have been driven and connected with the original works done 9 years ago. There are now about 900 cu. yds. of gravel in sight, which runs over \$2 per cu. yd. in coarse gold. The plant has a capacity of 40 cu. yds. per day; this can be increased at very little expense. The buildings are in good condition. A ditch $1\frac{1}{2}$ miles in length, owned by the company, supplies water power to run the pumps. The property is well timbered. The mine had already produced \$60,000 before passing into the hands of the present owners, who have taken out \$5,000 in a short time.

MADERA COUNTY.

(From Our Special Correspondent.)

SAVANNAH.—Reports from this mine to the Gold Mining Exchange show it to be in a most promising condition. This property consists of nine claims, and active operations are now being carried on in four of them. On the Savannah, Shaft No. 1 is down 275 ft. and Shaft No. 2 175 ft. On the Wide Awake Claim the tunnel is in 110 ft. On the Black Hawk claim there is a 30-ft. ledge and prospecting on this has just commenced. On the surface \$3 ore is found, which can be mined and milled for \$1 a ton. The following extract from the letter of the superintendent will show the state of the work on these claims on July 15th.

"At the present, 3 ft. of solid quartz is found along the footwall at the bottom of the shaft and $1\frac{1}{2}$ ft. mixed along the hanging wall. Breaking through the foot, a solid ledge of quartz is observed coming in, which prospects fully \$10 per ton. It is composed of the white milky quartz which has always run well here.

"The Wide Awake now shows up a ledge of 1 ft. pure quartz and heavily mineralized. Prospecting along the Blackhawk I have come on to a heavy gouge of decomposed quartz of about 2 ft. which will well pay for milling. With it is considerable quartz which prospects about \$3 per ton. I have thought it well to investigate the ledge further and learn its full extent and richness so am stripping off to secure entire width of ledge as far as possible without too much work."

NEVADA COUNTY.

(From Our Special Correspondent.)

MOUNTAIN CHIEF.—J. F. Crosett, of San Francisco, reports the sale of this mine, in Willow Valley mining district, two miles from Nevada City, to F. E. Ware, of Oregon, for \$10,000. The new owner will put in additional machinery and commence development at once. Considerable free-milling ore, which averaged about \$40 per ton, was taken out of the old workings, none of which extended below the water level. There are several veins from $1\frac{1}{2}$ to 3 ft. in width, two of which run through the center of the claim. A good hoisting and pumping plant on the ground is in good order. Mr. Crosett also reports that he has four experts out examining properties for eastern parties.

PLACER COUNTY.

(From Our Special Correspondent.)

PIONEER & LYNN.—At this mine, in the Towles District, two miles west of Damascus, the tunnel is in 750 ft. The total length of the tunnel, when finished, will be about 2,800 ft. They expect to strike the ledge at a depth of 525 ft.

PLUMAS COUNTY.

LA PORTE CONSOLIDATED.—At this hydraulic mine, which adjoins the town of La Porte, the clean-up, which has just been completed, has proved more than satisfactory to the officers and stockholders of the company. A handsome dividend will be declared and the working capital increased

so as to enable the superintendent to operate on a larger scale next season. The water is now quite low.

SLATE CREEK RAVINE.—In this ravine about 200 men have commenced work on tailings. Sam Ou Ta, an Americanized Chinaman, has leased 7,000 ft., at \$2 per foot, and is preparing to work 100 men.

UNION.—At this drift mine, one mile north of Gibsonville, a 95-oz. nugget, valued at \$1,400, has been found. The mine is being worked by tunnel, which is in about 2,000 ft. Some gravel from this mine has run as high as \$150 per car.

(From Our Special Correspondent.)

BUNKER HILL AND NORTH AMERICAN.—These mines, northeast of Gibsonville, at the headwaters of Slate Creek, have been purchased by O'Brien & Co., for \$30,000. Work will be commenced at once and preparations are being made to hydraulic on a very large scale next year.

SHASTA COUNTY.

A. J. Johnson, a prospector, recently came to Redding from the ranch of J. D. H. Williams, near that place, bringing with him fine specimens of copper ore. Johnson prospected in that district about two months and found gossan croppings, similar to those of the famous Iron Mountain mine, which was recently sold for \$300,000. He sank a shaft, and 15 ft. down found a 16-ft. ledge. The ore is quartz, and, report says, assays 27% in copper. The ledge can be traced on the surface for a distance of 160 rods. Carl R. Briggs, of Redding, is associated with Johnson and Williams in the ownership of the property. This is the richest copper ore ever found in this county. The ore of the Iron Mountain mine is considered very rich, although it yields but 14% in copper.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

BLACK BEAR.—This mine, seven miles south of Sawyer's Bar, contains six claims. The veins vary in width from 1 to 3 ft., the walls being serpentine and slate. About 50 men, under the superintendency of Benjamin Daggett, are employed with good results.

YUBA COUNTY.

(From Our Special Correspondent.)

BEEHIVE.—This old mine, comprising 20 acres of mining land and 160 acres of timber land, which is patented, has been bonded by Chicago parties. Oliver Roberts, who has been employed as superintendent, will put a force of men at work at once to repair the mill and other machinery and reopen the mine.

COLORADO.

BOULDER COUNTY.

KNIGHT TEMPLAR.—The Denver syndicate operating this mine has erected a large shaft house and steam hoister over the shaft, which is now down close to 90 ft. A large body of quartz is exposed in the bottom and sinking will be continued until a depth of at least 200 ft. is reached before levels will be started.

EL PASO COUNTY.

AMERICAN REDUCTION COMPANY.—The works of this company at Florence have shut down again for an indefinite period.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

ABE LINCOLN.—This property has just encountered the same ore shoot as found in the Arcadia, which it adjoins. The property is under lease to De Witt. The shaft has been sunk 130 ft. on a vein 18 in. wide and the vein was found to carry considerable sylvanite, estimated to sample by carload lots \$150 per ton.

ANCHORIA-LELAND.—This property recently made a six-car shipment to the Globe Smelter. The shaft has now reached a depth of 500 ft. The surface improvements are being vigorously pushed to completion.

ARCADIA.—This mine, situated in Poverty Gulch, has been the principal attraction of the week, owing to a rich seam of telluride ore varying in width from 1 to $1\frac{1}{2}$ in. and assaying from \$10,000 to \$100,000 per ton. The length of this rich seam is 10 ft. and still holds good in the breast of the drift at the 140-ft. level. The first shipment from this property sampled for the 30 tons $3\frac{3}{8}$ oz.; the second shipment of 9 tons, $3\frac{3}{8}$ oz.; the next shipment of 15 tons, $4\frac{1}{8}$ oz.; the next shipment of $33\frac{1}{2}$ tons, $4\frac{3}{8}$ oz., etc. The last shipment of 20 tons is expected to sample over 6 oz. The vein when first found in the shaft at 35 ft. depth was 4 in. wide, at 140 ft. the vein is 28 in. wide and the ore shoot has a length of 60 ft. with the breast of the drift still in ore. The course of the vein is northwest and the dip of the ore shoot is to the north. A new 60 H-P. boiler is on the ground, also a new No. 7 Cameron pump. The influx of water is now at the rate of 12 gals. per minute.

BONANZA KING.—This mine, on Gold Hill, under lease to the Claypool Brothers, is being worked by three shifts. The shaft is now 29 ft. deep, the vein 5 ft. wide. The shipment sent to the sampler last week, broken above a depth of 20 ft., sampled without assorting \$11 per ton. The lessees are much encouraged.

CITY VIEW.—This property, on Gold Hill, worked under lease, gives employment to 14 men. The shaft has been sunk 300 ft. At the 250-ft. level two crosscuts are being driven east and west to the boundaries to thoroughly prospect the ground. The west

crosscut looks encouraging, small seams from one-half to one inch of telluride ore being met every four or five feet. It is thought they are but feeders to a main vein in that district.

ELECTRIC TUNNEL.—This tunnel, piercing Bull Hill from the west, has now been advanced 410 ft. and another contract is about to be let for an additional 100 ft.

ELKTON.—This mine, on Raven Hill, shows steady improvement. The water can now be handled easily, and the output is increasing. The number of men employed is 82.

EL PASO.—At this mine, owned by the Gold King Mining and Manufacturing Company, they are sinking the shaft below the 300-ft. level and will sink it to 403 ft. before new levels are started. The mine gives employment to 40 men on development. This property never looked so well as at present, nor was there so much reserves blocked out.

GROUSE MOUNTAIN.—Several samples of rock have been assayed the past week from this section of the camp, with good results, yielding \$30 to \$75 per ton, and from shallow holes less than 18 ft. deep. It has long been the opinion of several prospectors that Grouse Mountain was one of the producing hills of the camp.

HOOSIER BOY.—This claim, on the divide between Poverty and Grassy gulches has a shaft 115 ft. deep and has recently been equipped with steam hoist. It is the intention to sink the shaft to the second or 200-ft. level, when stoping will be the order of the day.

LADY LOCELLA.—This mine, on Mineral Hill, owned by the Pennsylvania, Washington & Cripple Creek Mining Company, has now the deepest shaft north of the town of Cripple Creek. The shaft on the incline is 382 ft. deep, in a formation that is largely a mica schist and an altered granite containing iron pyrites.

PHARMACIST.—This mine gives employment to 37 men. The new or Jones shaft has been sunk 65 ft. The steam hoist, with 80 H-P. boiler, is at work, and a contract has been let to sink the shaft 100 ft. by machine drills; the size of shaft to be $4\frac{1}{2}$ ft. x 9 ft. in the clear. The shaft is being sunk by nine men. The old shaft yields its usual quantity of ore, the last shipment having netted \$310 per ton. A crosscut is about to be started at the eleventh level, to intersect the new vein, which has yielded high-grade ore at the 25-ft. level. It is expected that only a few feet advance will be necessary before the new vein is found.

POINTER.—This claim, situated on Blue Bell Hill, and owned by Putnam Bros., until recently under lease and bond to St. Louis people, is now being worked by the owners, who last week made a shipment of 17 tons to the sampler with gratifying results. The vein is a contact, having the phonolite on the east and the granite on the west, with the vein dipping slightly to the west. The shaft is 90 ft. deep, with two drifts being extended north and south.

TRACHYTE.—The shaft on this property is now down over 200 ft., and is being sunk at the rate of 2 ft. per day. The secretary, in a circular now issued says that "by August 1st we will start a new level, and it will require but a few days to be in ore again, with good stoping ground within a few feet of the shaft. We own the Trachyte claim of a trifle over eight acres, patented, and end lines against the Isabella properties, about 300 ft. from their new shaft."

GILPIN COUNTY.

SLEEPY HOLLOW.—At this mine they have been putting in a plant at the 800 level, and have also started to drive the east and west drifts at this depth, each drift now being in a distance of 35 ft. Sinking will still be continued, and in the shaft at present they have a crevice $4\frac{1}{2}$ ft. wide and about the same width in both bottom drifts. Sinking is being carried on with three eight-hour shifts, and a force of 22 men is now working in the property. Daily shipments of from 60 to 70 tons of ore are being made to the Eagle stamp mill.

(From Our Special Correspondent.)

CENTRAL CITY.—This mine, operated by a Denver stock company, has been closed down by the miners employed, who are behind with their pay. This sort of thing is much too frequent, and gives stock companies, particularly those hailing from Denver, a very bad name in Gilpin County.

MAMMOTH.—The air compressor and one of the boilers are being taken down from the shaft-house, where work has been entirely suspended, and re-erected at the mouth of the new Waterberry tunnel in Packard Gulch. Some prospecting is being done on the McAdams claim, near the deep shaft, and a little good-looking surface quartz is being got out.

STATE ORE SAMPLING COMPANY.—This company, of Denver, is commencing the erection of a new sampling works at Black Hawk, between the depot and the Rocky Mountain mill. For many years Messrs. Chamberlain & Co. have had a monopoly of the ore-buying business of Gilpin County, while Georgetown and Idaho Springs support several competing works. Most of the large producers in this county ship their smelting ores direct to Denver, but this is, of course, impossible for the smaller mines. There is a general feeling that competition would result in much better prices being realized for these small shippers,

and the new works are likely to attract most of the business, at any rate for a few months.

POCAHONTAS.—A commencement is being made with the repairing of the deepest shaft on this claim, with a view to permanent working.

GUNNISON COUNTY.

ARMSTRONG GULCH SILVER GROUP.—It is reported that this group has been sold for \$14,000.

CROSS.—Tanks for a cyanide mill have been ordered from Denver for the new cyanide mill to be erected at this mine to treat the tailings of the stamp mill. The foundation is under way.

DEW DROP.—This mill, at Ward, which is a concentration mill, is stated to be saving all the value in the concentrate mill except 15.7% or 84.3%. Before the mill was erected the industry made tests of the ore showing that 80% saving was practicable.

GOLD EAGLE.—A shipment of ore has been received in Denver from this mine, at Ohio City. The milling ore is being treated at the Empire mill. Twenty-four men are employed in the mine.

MILL CREEK GOLD MINING COMPANY.—The Gold King mine, owned by this company and managed by Harry Olympius, is down 72 ft. in smelting and milling ore. There are two streaks of smelting ore, one in the hauging wall and one in the foot wall, each about 6 in. wide. The milling ore is about 18 in. wide.

NEWMARKET.—A shipment of about 15 tons of high-grade smelting ore was made from this mine recently. Two drifts are being run, one to the east and the other to the west, at a depth of 250 ft. About 40 ft. have been run in each direction and the ore body is reported to be better than it was in the shaft.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

The strike has entered upon its fifth week, and as yet there are no signs of a settlement. The most important step was the seizure of the Weldon mine by Peter W. Breene, one of the co-owners, who, during the absence of Manager Schlessinger, proceeded to the property, and, demanding its possession from the watchman, installed himself as manager and began active operations. The Weldon, under Manager Schlessinger, has been paying only \$2.50 a day, and the men there walked out the night of the strike. Mr. Breene claims from the right of co-ownership to have the power to run the property, and he put on 100 union workmen at \$3 a day, claiming that the property was fully able to pay that amount. It seems that Breene owned a twelfth interest in the Weldon, and when the company incorporated he refused to go into the corporation, but it is alleged by other owners of the mine, that he agreed to sign over his interest and take stock in the company for same upon the payment of certain promissory notes held by him. Mr. Breene, however, has not yet given a deed to the property, but he did sign over his interest to the Leadville Savings and Deposit Bank, of which he was president. This bank failed, and the affairs were placed in the hands of an assignee; but as the assignee had no objection to Breene's operating the property, he still remains in possession of the same. The other owners of the mine, including C. B. Kountze, T. S. Schlessinger, G. Lightbourne, Dennis Sheedy, G. C. Bartels, and L. B. Brown, arrived in the city immediately after the trouble. They at once applied for an injunction restraining Breene from interfering with the property or from operating the same, and from selling or shipping or settling for any ore from the Weldon mine. Judge Owers granted a temporary injunction restraining Mr. Breene from selling, shipping or settling for any ore from the Weldon mine; he did not, however, restrict Breene from working the mine, and at this time Mr. Breene is still in possession and is conducting operations. In the complaint set forth by the plaintiffs they speak of the productive character of the mine and state that the Weldon Mining Company has realized a profit of not less than \$90,000 from the mine; that the different levels are 5,000 ft. in extent, and the workings are kept free from water by the pumping of the Bon Air and Penrose properties. They then call attention to the fact of the strike being in effect here, and allege that unless Mr. Breene is ousted from the property, and compelled to discontinue operating the mine at \$3 a day, the owners of the Penrose and the Bon Air properties, who are opposed to paying \$3 a day, will withdraw their pumps, in which case the Weldon workings would be flooded, causing great damage, in fact, would ruin the entire mine. The temporary injunction restraining Breene from selling or shipping ore from the Weldon was served on Saturday. The case will likely be in the courts in a few days.

ALGER GOLD MINING COMPANY.—Articles of incorporation of this company were filed this week. The incorporators are A. W. Mansur, F. H. Thompson and W. H. Young. The capital stock is \$1,000,000. Shares are \$1 each.

BELLE OF GRANITE.—A suit has been filed in this county which involves the ownership of this mine, one of the richest properties in Granite. This mine has been operated a number of years, and is considered a valuable piece of property. The suit is filed by August Pine, Joseph F. Mero and Enos Shane against Charles Parker and the Inverness Mining Company. The complaint alleges that they are owners in fee of the Belle of Granite lode, and that on February 3d, 1896, they

entered into an agreement, partly in writing and partly verbal, for the sale of the Belle of Granite mine for \$20,000, to be paid as follows: \$500 in cash, \$8,000 in shares of the Inverness Mining Company and the balance in instalments, to be paid in February, March and May. Thereupon Charles Parker went into possession of the premises. On March 31st plaintiffs extended the time of payment of the last instalment and afterward granted another extension; but they allege that Parker has wholly failed to comply with the agreement to purchase the property. They also claim that he has conveyed to the Inverness Mining Company the property in question. They therefore ask for the possession of the Belle of Granite Lode and for \$5,000 damages.

UNION LEASING AND MINING COMPANY.—At the regular meeting of this company, officers for the ensuing year and board of directors were elected as follows: S. W. Mudd, R. B. Estey, H. I. Higgins, John Harvey, F. L. Bellan, J. E. Price and J. H. Crandell. The only change in the personnel of the board is the selection of Mr. Crandell in place of N. M. Estey.

UNION SMELTER.—This smelter, which has been under lease to Kansas City parties for some months, and which was closed when the lease expired about two weeks ago, was sold this week at trustee's sale. The property was purchased by A. V. Hunter as trustee. The purchase price was \$56,000. It is not yet known what the plans of the new owners are.

IDAHO.

WARREN PLACER COMPANY.—This company has filed articles of incorporation with the secretary of the state. Offices, Camden, N. J.; Philadelphia, Boise and Warrens; capital stock, \$100,000; incorporators, Joseph Steelman and Henry Fox, of Philadelphia; William D. Lippincott, of Cinnaminson Township, N. J. George H. Roberts and William O. Taylor are designated as Idaho agents of the company.

OSTER COUNTY.

RAMSHORN MINES, BAY HORSE.—Mr. Horace F. Brown, consulting engineer of Chicago, Ill., advises us that he has gone to Idaho with Mr. O. J. Salisbury, manager of these mines, for the purpose of beginning the work of building a large mill, which will have a daily capacity of 75 tons, using the hypo-sulphite leaching process. The crushing apparatus will be dry crushing stamp batteries, using 1,000 lb. stamps. The mill will be fitted with automatic machinery complete, including salt and sulphide feeder for chloridizing, Brown's elliptical combined roasting, cooling and conveying furnace (which was described and illustrated in our issue of the 4th inst.). It will also have a complete dust collector so as to be practically dustless, and in all respects will be a thorough modern mill.

SHOSHONE COUNTY.

HECLA.—This mine, at Burke, shipped a carload of ore recently, the first in four years. D. Caidoner has leased the mine and will push work as fast as possible. There is a tunnel 700 ft. long, and he is sinking to a lower level, where he will drift into the ore.

POORMAN & TIGER CONSOLIDATED MINING COMPANY.—The pumps at this mine have lowered the water to below the 400-ft. level, and have mastery of the incoming water. The concentrator is not expected to be ready for operation before September.

KANSAS.

ALLEN COUNTY.

(From Our Special Correspondent.)

William Lanyon, of Pittsburg, Kan., and his brother, R. H. Lanyon, of Nevada, Mo., are building a new smelter at Iola, Kan.

The citizens of Iola have donated the Lanyon Brothers the site for the smelter and also two of the strongest gas wells in the city and will pipe the gas for them. Their plan is to use gas instead of coal to smelt the ore. This in a manner is an experiment with them. While the style of the buildings and furnaces will be different from those in which coal is used, they will be so constructed that the cost of changing from gas to coal will be merely nominal should the change become necessary. Two better experienced gentlemen to test the work of gas as against coal for smelting purposes cannot be found, and it is safe to say they will give gas a thorough test before giving it up. They have spent a lifetime in the smelting industry and are therefore prepared in every way to test it. They have bought several carloads of zinc ore at Carterville, Mo., and Galena, Kan., to make their run of ore, and if their smelter proves a success it will add another buyer to the Joplin zinc ore district.

CHEROKEE COUNTY.

(From Our Special Correspondent.)

AUSTIN & COMPANY.—On the Templar lease this company has struck a fine zinc ore prospect at 90 ft. in flint ground and no water. They have started a drift at 98 ft. on a good face of ore and will continue to sink.

DERFELT & COMPANY.—On the Sonneberg lease this company is drifting at 80 ft. on a large face of lead and zinc ore in hard ground and making 40 tons of crush ore, 18 tons of free zinc and 2,500 lbs. of lead each week.

FRYE & ALDRICH.—These parties have leased 4 acres of the South Side Company, have put in a pump and are sinking the pump shaft to 150 ft., getting good pay dirt while sinking. At shaft No.

2 they are drifting at 75 ft. on a large face of lead and zinc ore in hard ground, and are making a large output of ore every week.

KERR, HALL & COMPANY.—On the Crystal lease this company is drifting at 70 ft. on a large face of lead and zinc ore in flint ground. They are making 20,000 lbs. of lead, 10 tons of free zinc ore and 35 tons of rough ore each week.

LIVELY, CRANE & COMPANY.—This company has leased 15 acres of the South Side Company. They have sub-leased all the lots, and shafts are going down on nearly all of them. At the pump shaft they have the water out and are drifting at 112 ft. on a large face of lead and zinc ore in open ground. They will sink the shaft to 150 ft. as there is rich ore in the bottom of the shaft.

SOUTH SIDE COMPANY.—There are now 12 pumps on this company's lease mining steadily and more are to be put in, as the company is determined to drain the ground thoroughly to a depth of 150 ft. They have sub-leased to different companies from 4 to 15 acres with the agreement that the sub-lessee shall sink one shaft 150 ft. and put in a pump. Lead and zinc ores have been found at from 40 to 138 ft. depth and mostly in shooting ground, although some places must be timbered. There are at present 7 large producers of ore, and next week there will be 8 more to make their first shipment of ore.

LEAVENWORTH COUNTY.

LEAVENWORTH COAL COMPANY.—The State of Missouri has commenced injunction proceedings in the Federal Court against this company, claiming that it is extending its operations under the Missouri River and encroaching on Missouri State property. The value of the coal beyond the middle of the river on the Missouri side is placed at \$50,000.

KENTUCKY.

ANDERSON COUNTY.

BLACK DIAMOND COAL COMPANY.—There seems to be no prospect of a settlement between this company and its men, and the general presumption is that no immediate settlement will be made. The company has cut off the men usually employed in repairing, and has reduced the number of salesmen in the stores. This stoppage is affecting from 400 to 500 men.

KNOXVILLE IRON COMPANY.—This company is operating two mines, Nos. 1 and 2, which are running at almost full time. There are probably about 750 men employed in the mines with no visible prospect of a reduction being offered or any disturbance occurring.

BELL COUNTY.

BRECKENRIDGE.—Smith Bros. have taken a lease under the receiver of this property at Pineville, and are operating 100 coke ovens. The analysis of Pineville coke shows it to be purer than any other coke in that section. Smith Bros. ship coke to Ducktown for copper smelting and to northern points for steam and brickyard use.

LAWRENCE COUNTY.

It is reported that an oil strike has been made in the Blaine Creek territory worth 15 barrels per day. The oil is said to be a fine lubricant, and the same quality as was found there 28 years ago, the field having been abandoned later through the great decrease in the price of oil.

MAINE.

KENNEBEC COUNTY.

AUGUSTA GRANITE COMPANY.—The stock of this company has been sold out to Wm. A. Egermann, of New York, who is making preparations to start work on the quarries, near Augusta. He will employ about 150 men.

MICHIGAN.

COPPER.

CENTRAL MINING COMPANY.—Supt. Frank M. Stanton, of this mine, considers the outlook at the property decidedly encouraging. The Central, after many years of active working, during which it paid dividends of \$2,000,000, was practically abandoned 18 months ago. It is now employing 60 men and producing 100,000 lbs. monthly, with excellent prospect of further increase in productive capacity in the near future.

OSCEOLA MINING COMPANY.—The new No. 6 shaft of this company, which was begun during March, 1895, has been connected with the workings of the 14th level. No. 6 is a large double compartment shaft, well timbered, stations cut at several levels, and is one of the largest and best shafts on the peninsula. The depth of the shaft is 1,400 ft., and, it is said, was put down in the quickest time of any similar undertaking in the history of copper mining.

MINNESOTA.

(From Our Special Correspondent.)

Iron-ore shipments from Two Harbors for the past week have been 44 cargoes, of 90,000 tons. The shipments from the two Minnesota ranges for the season to this date have been about 2,150,000 tons, of which a trifle more than half has gone forward from Duluth. At that port one day last week the record for loading was broken by the shipment of 28,400 gross tons. It is now estimated that the season's tonnage from Two Harbors will be 2,200,000 tons making a total movement from the State of almost 5,500,000 tons, which is slightly less than earlier figures.

Vessel records in the ore line have been broken with surprising regularity the past week on Lake

Superior; first came the new ship of the Bessemer fleet, in whose performance there was the deepest interest, as she was the first vessel of the Rockefeller line, the first of the new class of ore carriers to be loaded, and a departure from old lines in several ways. She took out of Ashland 4,537 net tons, which was the largest cargo ever taken from the lake. The "Queen City" had taken a few days before a load of 4,530 tons of wheat, which led till the "Bessemer." Then the barge "Aurania" loaded at Duluth 4,518 net tons of ore, and now the "Queen City" has taken a load for Chicago of 4,067 gross, or 4,550 net tons of ore. While these loads are tremendous now they will be small next year, when the same vessels that are now making the records will be carrying from 6,000 to 6,500 net tons. The new American Sault canal, with its 21 ft. of water, will be in use next month, but its full depth will not be available on account of the noncompletion of the connecting channels.

The case of the Security Land and Exploration Company, of Duluth, against a number of homesteaders, claiming to own land between the mapped descriptions of its purchases and the shores of Ely Lake, the lake not being in accord with the maps, has been lost, and the homesteaders' claims are decided good. The survey was fraudulently made, by one Howe, who put a lake where none existed, and a number of men took up land between where the meander line showed on the plats and where it was on the ground. This land the company, which had bought to the platted meander, wanted.

MESABI RANGE.

(From Our Special Correspondent.)

ADAMS MINING COMPANY.—All mining has been stopped and one shovel is loading the stock pile.

BIWABIK BESSEMER COMPANY.—This company is shipping about 2,500 tons a day, all the work being done with two shovels and one attendant locomotive, working days only. The mine is shipping some very fine Bessemer ore and a market is readily found. Its shipments for the season will be about as expected at the commencement of the year. Stripping is still going on in the mine, and will continue for a month at least.

CLOQUET IRON COMPANY.—This is the company formed to take and operate the recent purchase of the Vega mine, in Eveleth, and Jos. Scilwood and others are the purchasers. The deal is one of the most important made on the range for a long time. The property is a very valuable one. Operations will begin at once.

GENOA IRON COMPANY.—This company is hoisting ore from its No. 1 shaft and is sinking No. 2. The grade for the railway connections to the mine have been completed and the rails are being laid. When done, the mine will begin shipping. Its 1896 shipments will not be more than 40,000 tons.

HALE IRON COMPANY.—This mine is steadily shipping about 1,000 tons a day on its contract with the Thomas Iron Company of Pennsylvania. Ore has been struck at a depth of 80 ft. on Section 32-58-20, where Barnes & Upton, of Duluth, are at work.

HIBBING TOWNSITE.—Messrs. Hibbing & Trimble, owners of this property and the mineral leases in connection, have sold to Messrs. Kinney, Chisholm & Washburn, of Duluth. The prospecting for ore on the east 40 acres of the townsite will begin at once. There are excellent indications of ore there. All the interests of the sellers in the town of Hibbing, of which they were founders, also go in the sale.

OLIVER MINING COMPANY.—This company has loaded 156 25-ton cars of ore direct from the ore bed with its new shovel in 10 hours, the shovel being helped by one locomotive. Work continues very active.

VERMILION RANGE.

(From Our Special Correspondent.)

SOUTHALL MINING COMPANY.—This company has explored its property near Ely, and has sunk into fine ore 25 ft. Work is still going on. The outcroppings have been traced for about half a mile, and the vein is shown to be not far from 150 ft. of average width. Active work will be prosecuted to make it a mine.

ZENITH IRON COMPANY.—This company is shipping some 300 to 400 tons of hard ore daily.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The output of ore last week was about the same as the week before. The sale of zinc ore was larger than the amount produced and the surplus ore in the different camps has been greatly reduced. The price of ore has been increasing every week from 50c. to \$1 a ton, and quite a number of the smelting companies are stocking up on zinc ore. The price of zinc ore made a sharp advance last week, some of the operators having received \$2 more a ton. One lot of ore sold at \$23 per ton and several at \$22 per ton. The average was nearly \$20 per ton. The price of lead ore was the lowest since 1879, and a large number of the mine operators are holding their lead for better prices. The price paid was \$15 per 1,000 lbs. with 50c for hauling. The following is the output from the different camps in the district: Joplin zinc, 1,425,440 lbs.; lead, 171,110 lbs.; value, \$18,336. Webb City zinc, 302,930 lbs.; lead, 35,960 lbs.; value, \$3,436. Carterville zinc, 879,350 lbs.; lead, 176,330 lbs.; value, \$10,949. Galena, Kan., zinc, 2,540,000 lbs.; lead, 473,000

lbs.; value, \$20,127. Aurora zinc, 680,000 lbs.; lead, 50,000 lbs.; value, \$4,535. Mt. Vernon zinc, 81,410 lbs.; value, \$814. Oronogo lead, 12,050 lbs.; value, \$171. Zincite zinc, 26,010 lbs.; value, \$247. Totals for the district: Zinc, 5,938,140 lbs.; lead, 918,150 lbs.; value, \$58,813.

JOHN H. TAYLOR LAND.—The 100-acre tract of mineral land at the head of Leadville Hollow, west of Joplin, owned by Mr. J. H. Taylor, is quietly and steadily pushing to the front. This land is known to the public chiefly by the record of the "I Know," "Big Eight" and other mines on the Joplin Prospecting Company's 40-acre lease out of the center of the tract. Mr. R. B. Cholmondeley has 20 acres leased west of the Joplin Prospecting Company's lease which he named the Mingo, and Mr. Taylor has 40 acres reserved on the east which he is letting out to miners at the customary 20% royalty. Some important changes and developments have lately taken place that are worthy of note. The "I Know" Company has bought out Morris & Trimble on the south and sunk the pump shaft 15 ft. deeper for the better drainage of their land. This will also permit them to take up a 15-ft. slope to work on their deeper ore.

Mr. Cholmondeley's mine, the Mingo Discovery, is being steadily opened up and promises to be one of the best. They have been sinking and drifting by turns until now the shaft is 115 ft. deep. Drifts have been opened at various levels, the last at 95 ft., which taken together show that there is a run of ore 50 ft. high in hard ground. A steam concentrating plant will be built soon as one will be necessary to handle the ore successfully. Hacker & Co., on the reserve near the "I Know," are opening up a good mine. They have bought out Lewis & Co. adjoining them on the north, and now have a mining property that will require a steam concentrating plant. The Damifino Company, with one of the richest bodies of ore on the tract, opened ready to hoist rich pay dirt, is shut down while the company builds steam jigs. The "Big Eight" mine is a wonder in the extent and richness of its ore, both lead and zinc. They have developed a face of ore 50 ft. high and of unknown width. The upper part of their run being especially rich in lead, they are, and have been for two months past, running on that alone. Lurwick & Co., on the reserve, who have been sinking for the past few weeks, have their shaft down 145 ft. in good zinc ore and water that requires a pump. They are opening a drift at 125 ft., the top of their run being in both lead and zinc ores. Like others on this tract, they must put in machinery soon. Already this tract of land, which has been opened up less than a year, has produced over \$90,000 worth of lead and zinc ores, the principal part of which has been produced by the "I Know" mine from less than one acre of ground.

SHERWOOD COMPANY.—This mining company has leased 40 acres of land situated 6 miles northwest of Joplin on the Carl Junction road. The ground has been drained to a depth of 140 ft. They laid out 40 acres in mining lots, and are now open for prospectors to register on. Good red pebble zinc ore was found from 60 ft. down in open ground, and the miner will have no trouble in sinking a shaft on account of water. This neighborhood was at one time one of the biggest producing camps in the district, but of late years very little prospecting has been done as there were no pumps in the neighborhood to drain the ground so that a shaft could be sunk.

MONTANA.

FERGUS COUNTY.

AMMON-STIVERS MINING COMPANY, INCORPORATED.—Col. R. A. Ammon, the president, stated to a representative of the *Engineering and Mining Journal* that he purchased the property now owned by this company from the Gilt Edge Mining Company at sheriff's sale in 1894 for \$48,000, and that he has erected a cyanide plant which cost in the neighborhood of \$80,000. Colonel Ammon was the general manager of the Gilt Edge Mining Company before the sale of the property. He says that he believed he knew the best method for the treatment of its ores, but some of the other officers thinking they could manage the property better than himself, started the operations which resulted in a sheriff's sale. There were some liens in the Gilt Edge Mining Company, and these people, after the property was sold, forcibly evicted the superintendent appointed by the purchasers, and took possession of all the workings. In consequence of this a petition was filed at Great Falls by the officers of the Ammon-Stivers Mining Company to the effect that the parties who were operating the mines did not understand the cyanide process of treating the ores, and that they were ruining the machinery. Colonel Ammon says that when the matter was brought up in court he asked and was appointed receiver, and that he in turn placed Mr. L. G. Phelps, of Great Falls, in the new position. Everything is said to be in successful operation now, and it is hoped by Colonel Ammon that those who are really entitled by law to claim moneys on the mines will soon be paid. The officers of the Ammon-Stivers Mining Company, incorporated, are as follows: Col. R. A. Ammon, president; R. M. Stivers, first vice-president; E. B. Foote, Jr., second vice-president; F. B. Thurber, third vice-president; Walter Lauder, secretary and treasurer. The principal office of the company is in New York City.

JEFFERSON COUNTY.

BLAINE MINING COMPANY.—This company, operating in the Cataract District, is about ready to

resume operations on the Blaine and Garfield lodes. The former is developed by a 700-ft. tunnel, which cuts ore that is said to assay \$18 in gold and \$27 in silver and lead. There are 350 tons of ore blocked out in the Blaine and 20 on the dump. The Garfield has on it a 300-ft. tunnel.

ONLY CHANCE.—W. P. Flowers, of Butte, is at present opening up this mine, in the Highland District. A great deal of new machinery has been put in place and the old mine, which has not been working for 14 years, will again be a scene of activity.

MISSOULA COUNTY.

IRON MOUNTAIN MINING COMPANY.—At a special meeting of the directors of this company recently, President Hale was authorized to begin the work of running a tunnel to tap the mine at a depth of 1,600 ft. The tunnel will be 5,600 ft. long, and it will take a year or more to complete it. It will cost somewhere in the neighborhood of \$70,000 to do the work.

SILVER BOW COUNTY.

The returns made to the county assessor, purporting to be the net profits of the different companies operating in Butte, are as follows: Boston & Montana Company, \$2,015,655.75; Anaconda Copper Mining Company, \$1,125,379.56; Montana Ore Purchasing Company, \$291,800; Parrot Copper & Silver Company, \$93,961.84; Ellingwood & Kornberg (Hibernia), \$54,950.00; Original Mining Company, \$25,362; Colorado Smelting & Mining Company, \$9,658.96; W. A. Clark's properties, \$5,112; Old Glory Mining Company, \$5,000; James A. Murray's properties, \$4,065.38; Moulton Mining Company, \$1,617.80; Alice Gold & Silver Mining Company, \$1,217.27; Consolidated Morning Star Company, \$419; Arlington Mining Company, \$406.58. Total net proceeds, \$3,634,606.75. Companies not included in this list claim to have either run behind or the expenses and improvements were so great that they made no profit at all.

It is impossible to get a correct report of the amount of new improvements made at the mines during last year, which is deducted from the above net profits. A large amount is also taken out by leasers which cannot be secured.

More money has been expended during last year than during almost any other similar period. The Anaconda Company's three new hoisting plants alone amount to over \$250,000. The Montana Ore Purchasing Company has expended in the neighborhood of \$250,000. The Colorado Company has put a large amount of money into improvements and so has the Parrot. This is also true of the Clark's Reduction Company and mines.

BLUE BIRD COMPANY.—This old company has filed with the county clerk a statement of its financial condition showing a capital stock of \$500,000, \$25,000 of which was paid in cash, and the balance in property. The company's assets are \$60,530 in property and \$8,000 in cash. The liabilities are \$96,000 in outstanding notes.

BOSTON & MONTANA COMPANY.—This company is making great improvements in its hoisting plant at the West Colusa mine. Forty men have been laid off and the old engine is being torn out. It will be replaced by a new 20 x 60 first motion engine of the most improved pattern. Some of the miners were put to work at the Leonard Shaft, but most of them will be idle until the West Colusa plant is completed.

GAGNON.—The shaft of this mine is now being sunk from the 1,400 to the 1,500-ft. mark. When the work is finished the shaft will be on equal footing with the Alice, which is now the deepest in the district.

MARY LOUISE.—Crosscutting from a depth of 200 ft. is in progress at this property, in the southern part of Butte. The work is being done by C. W. Ellingwood and others.

NEVADA.

STOREY COUNTY—BRUNSWICK LODGE.

The following are extracts from the latest weekly reports of the superintendents:

BELCHER.—There have been hoisted during the week and stored in the orehouse at the mine 87 mining carloads of ore, the average top car sample of which shows an assay value of \$24.30 per ton.

CHOLLAR.—Shaft No. 1 was sunk 13 ft. on the incline, passing through porphyry, clay and quartz, and is down 505 ft. 200 level—The south drift on this level has been driven 26 ft. for the week, and is now in 182 ft. skirting the footwall. 300 level—The Chollar Company took the joint south drift at the Hale & Norcross south line, 144 ft. from the shaft station, and continued it 28 ft.; total length, 172 ft. south of shaft No. 1. When in 141 ft. from the shaft a streak of quartz 18 in. wide came gradually into the drift from the east, assaying from \$5 to \$75 per ton, of which not quite one-half was gold.

CONSOLIDATED CALIFORNIA & VIRGINIA.—Shaft No. 2—This shaft was sunk 8 ft. on the incline; total depth 274 ft., bottom in hard porphyry. 150 level—During the early part of the month work was resumed in the south drift. This drift was run from the west crosscut, which was run from the main south drift; at the time of its discontinuation it was extended 85 ft.; during the past week we have advanced it a further distance of 10 ft., passing through hard porphyry and stringers of quartz; total length, 95 ft.

GOULD & CURRY.—The main tunnel has been extended 25 ft., passing through porphyry and string-

rs of quartz; total length, 829 ft. The west crosscut No. 5, started in this tunnel at a point 800 ft. from the mouth, has been extended 14 ft., passing through hard porphyry and quartz; total length, 40 ft.

SAVAGE.—During the past week have hoisted 74 cars of ore; car sample average \$19 per ton. Shipped to the Nevada mill 90 tons, and milled 90 tons, the battery sample average of which was \$21.24. Have bullion on hand and at the mill of the assay value of \$1,350. Ore shipments have been discontinued for the present. The bullion yield of the mine for the month of June was: Gold, \$7,800.31; silver, \$19,205.18. Total, \$27,205.49. Net cash received, \$17,611.87.

SEGREGATED BELCHER.—There have been hoisted during the week and stored in the orehouse at the mine 29 mining carloads of ore, the average top car sample of which shows an assay value of \$29.85 per ton.

STOREY COUNTY—COMSTOCK LODGE.

CONSOLIDATED CALIFORNIA & VIRGINIA.—1750-ft. level—From thirteenth, sixteenth and the twenty-first floors and from an upraise carried up to twenty-fourth floor above sill floor of this level at north end of stope in old ground of former workings there have been extracted during week 75 tons of ore, average assay value of which, per samples taken from cars in mine, was \$80 per ton.

NEW JERSEY.

PASSAIC COUNTY.

BLESSING QUARRY.—A new quarry has been opened by J. F. & C. Blessing on their property near Oak Ridge. There is a good face of rock already uncovered.

NEW MEXICO.

BERNALILLO COUNTY.

LITTLE PITTSBURG.—An important strike has been made in this mine, in North Canon, 20 miles from Albuquerque. An assay made from rock taken across the vein is said to yield \$752 in gold per ton. The shaft is now down about 80 ft.

SOCORRO COUNTY.

GRAPHIC SMELTER.—This smelter, at Magdalena, the largest in operation in New Mexico, has been running for several weeks. There is a large quantity of low-grade ore in the mine and on the dump, which can be treated at a profit. Its capacity is 100 tons a day.

NEW YORK.

ULSTER COUNTY.

JOHNSON QUARRY.—This quarry has been opened on a large bed of bluestone lately uncovered at Mt. Prosper. The owner is George Johnson, of Wurtsboro.

OHIO.

SUMMIT COUNTY.

AKRON SALT COMPANY.—This company has commenced active operations. At a depth of 2,680 ft. the salt rock was struck, but the drill was sunk 158 ft. farther. A 10-in. pipe was put down 350 ft., then one 6½-in. pipe inside to the salt rock, and inside of that a 3½-in. pipe. Water is forced down the 6-in. pipe, and the brine is forced up the small pipe. The salt is evaporated by the vacuum process. When the second well is finished they will have a capacity of 1,500 bbls. every 24 hours, and will employ 60 men.

OREGON.

UNION COUNTY.

UNION-COMPANION.—These mines, in Cornucopia, have passed into the hands of W. J. Clark, of Montana, and John E. Searles, of New York. The payments, extending over a period of 18 months, were made in installments of \$10,000 every 60 days. The final payment was made last week, and the deeds were forwarded to Union for record.

PENNSYLVANIA.

TWIN SHAFT DISASTER.—The work of reaching the entombed miners still continues, but progress is extremely slow, as must be expected. Twenty-six days have passed since the cave-in occurred. A meeting has been called, to be held at Pittston, Pa., July 24th, at which the advisability of abandoning the search for the bodies will be discussed, and to appropriate the money that the rescue work is costing to the relief of the victim's families. Those asked to attend the meeting are prominent coal operators of the Wyoming and Lackawanna valleys and the three mine inspectors who constitute the Governor's investigating committee. What conclusion will be reached is not an easy matter to predict, for while honest opinions are held both for and against continuing the search, many who entertain the latter opinion at heart deem it unwise to openly express such views. It is easy to understand that much personal feeling must exist upon so sensitive a point as this one.

ANTHRACITE COAL.

EAST RIDGE COLLIERY.—One hundred miners struck at this colliery, Schuylkill County, for an advance of 15c. per mine car.

LEHIGH VALLEY COAL COMPANY.—The employees of this company's collieries were agreeably surprised last week when they were ordered to resume work on full time, beginning on July 20th, instead of four three-quarter days a week, as heretofore. This company has ten collieries in the Shenandoah neighborhood, and gives employment to 5,000 men and boys.

CAMBRIA COUNTY.

CONEMAUGH STONE AND MINERAL COMPANY.—This company has been organized by T. W. Lindsay, W. P. Van, John M. Davis and others to open quarries near Johnstown. The company intends to work on a large scale, and has secured some good property. The office is at Johnstown.

CHESTER COUNTY.

CHRISTMAN LEAD MINES.—These mines, in Schuylkill Township, have been abandoned after being worked for 50 years. The machinery has been moved by the Rickands, the owners of the mines, to South Jersey, where it will be used in the development of mines in that section.

CLINTON COUNTY.

Capitalists have leased 6,000 acres of land near Lock Haven, with a view to drilling test wells for gas and oil. Surface indications are said to be good. Several wells will be drilled.

SOUTH DAKOTA.

(From Our Special Correspondent.)

A number of miners and prospectors who left the Central Black Hills during the spring months to try their fortunes in British Columbia have already returned. They give varying but generally unfavorable reports of the region, a not surprising fact when the unusual attractions of the Black Hills are remembered. No other mining region has made a finer bullion showing upon comparatively limited development. Pennington County is a poor man's region. He finds ample fuel and water, a moderate altitude and an excellent climate. He may mine a portion of the season, which lasts from May to January, and raise oats, potatoes and other vegetables during the balance. He is sure of a living, and usually finds a good demand for labor and his surplus products. Every expert and mining man who visits the region in a palace car and rides out to make his examination in a cushioned carriage remarks these advantages. As a New York clubman recently put it, "That is a kid-glove mining country." That it is a mining country, the Homestake, Golden Reward, Horse Shoe, Yellow Creek and Bald Mountain attest at the north, while the Keystone, Holy Terror, Bullion, Bismarck and a score of less developed mines accumulate evidence and bullion in the Central Hills.

LAWRENCE COUNTY.

GOLDEN REWARD COMPANY.—The ore chute exposed in the Tornado workings of this company, on Bald Mountain, is now furnishing about 150 tons a day to the company's chlorination plant. The same company is making preparations for opening on the Plutus ground, and will soon have a mine in operation there. The Bald Mountain belt is supplying daily from 500 to 600 tons of rock, running from \$30 to \$100 to the ton.

PENNINGTON COUNTY.

ANNIE.—The 80-ft. prospect hole upon this Spring Creek property has been enlarged to a working shaft and substantially timbered. A hoisting engine is in place, and after reaching the 100-ft. level, drifts will be run upon the vein.

BIG HIT.—Reports from the Keystone Camp, are to the effect that a fine body of milling ore has been opened in the north drift of this property, at a depth of 120 ft. The development is being done by Milwaukee capitalists under a bond.

GOLDEN SLIPPER.—Work under the development lease upon this property has progressed to a depth of 180 ft. The shaft is upon the vein which dips to the west, with a strike northwest and southeast, the common course of the ledges in that portion of the Spring Creek District. The shaft has been in high-grade ore from the 130-ft. level, where the lessers began work. Twelve thousand dollars has been taken from limited workings above the 130-ft. level, the last mill run of 185 tons yielding nearly 200 oz. of bullion.

GOLDEN SUMMIT.—After several weeks spent in prospecting this property, Dr. Rothermel, of Brooklyn, N. Y., says that the formation of the Summit is the most difficult and perplexing that he has ever met with. The group of claims which comprise the Golden Summit property seems to be traversed in every direction by blind ledges of varying width, the majority of which carry good free gold values. The ground lies within two miles of Harney's Peak, the central mass of the Black Hills upheaval, and, as miner's express it, "there's no more order in the formations than there is in a dog's breakfast." At one point Dr. Rothermel has uncovered four intersecting veins, striking in different directions, two of which have perfect walls and carry a heavy gouge without a sign of quartz. It is said that the Golden Summit Company will explore the veins located by Dr. Rothermel by deep working. The mine yielded \$60,000 from surface workings years ago and an attempt will be made to recover the lost ore chute or uncover a similar body of high-grade ore.

JUNIPER FRACTION.—No bulletins from this famous prospect have been posted for several weeks. A tunnel is in progress to cut the vein, and when encountered rich ore is anticipated.

KRESSY PLACER.—A substantial flume about ¾ of a mile in length was recently completed by Messrs. Lampert and Kressy, to their bar lying near the I. R. Mill. They will ground-sluice the bar, and also use the water for increased power at their Custom plant.

SUNNYSIDE.—The work of sinking continues upon this property. The shaft has now reached a depth

of about 120 ft., and it is understood that the development company will continue the work to a depth of 200 ft. The vein, like many others of the narrow high-grade order in this region, contracts at some points to a mere gouge, but it invariably widens out below. The ledge in the Holy Terror mine above the 87-ft. level, pinched to a gauge but 4 in. wide, but at its present level, 200 ft., a good body of high-grade ore is being mined. Messrs. George and Kipp, of Milwaukee, Wis., who are interested in the three properties controlled by Wisconsin capital, the Sunnyside, Holy Terror and Golden Summit, paid a visit to the properties last week. The Holy Terror is said to be making an especially good showing.

WASHINGTON.

The State of Washington has made an appropriation for a wagon road extending from Skagit River to Okanogan, across the mountains, for the purpose of opening up the mines and affording an outlet for the ore of the Cascade District, where Omaha capitalists are developing the Rigby group of silver-lead mines.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

ROSSLAND.

Mr. P. A. Peterson, chief engineer of the Canadian Pacific Railway, has returned from an inspection of the line, and declares that, from what he has seen, British Columbia is the finest gold-mining country in the world. "The great drawback is lack of communication," said Mr. Peterson. "What the miners need is coke for smelting purposes, and this they do not have. I know of one case in which coke was imported from England. The notable thing about the gold fields of British Columbia is that they are not confined to one section or area, but are scattered over the country for hundreds of miles. What is needed is a railway through the Crow's Nest Pass, which would tap the finest coal producing country in the world, and by means of which the miners would get their coke, which is indispensable, and the lack of which causes them at present to labor under serious difficulties. The Canadian Pacific Railway has always been favorable to building this road, but it considers it a matter for the local and Dominion governments to interest themselves in. However, it is asserted that the road will be built at the earliest possible date, if not with the assistance of the government, then at its own expense.

TRAIL SMELTER.—It is reported that this smelter has signed contracts under which it is to smelt the entire output of the War Eagle, Iron Mask, Virginia and Poorman, in addition to its contract on the Le Roi. The company also contracted for the output of the Crown Point, which now has 3,000 tons on the dump. At present 250 men are employed at the smelter.

CARIBOO DISTRICT.

It is reported from Seattle, Wash., that J. Edward Addicks, the gas king of Delaware, is to head a corporation to work for gold in the gravel beds of the Cariboo. The company, which has been incorporated under the name of the British Northwest Gold Mining Company, Limited, has a capital stock of \$5,000,000, and will operate on the Fishback property on the Quesnelle, a gold-bearing tributary of the Fraser River.

In this tract are 700 acres, with an average depth to bedrock of 275 ft., all of which, it is estimated, will pay at least 12½c. per cu. yd. The water system of the property drains more than 45 sq. miles of mining ground.

The company also controls the property of the Maud Hydraulic Mining Company, and in addition has acquired 20 miles of the river bed of the main Quesnelle, a stream known to old prospectors as the Pactolus of British North America. The head office of the new company will be located in Seattle.

VANCOUVER.

It is reported that along the Northern Railway, between Whatcom and Goshen, bush fires have burned many farm buildings and railroad supplies. At Vancouver two fires were caused by sparks from the bush fires, a house and a steamer being burned. Dense smoke has settled down over the seaport towns, and navigation can scarcely be carried on.

Alberni is surrounded by an immense fire, which has taken entire possession of Mineral Hill, a wealthy section. The flames have destroyed all buildings in the Duke of York Mine, China Creek, and are now within two or three miles of the town. The damage to property thus far is estimated at over half a million dollars, and the loss on burned timber will reach millions.

Word received from Kaslo and points along the Arrow Lakes in British Columbia says that where the miners thought they were safe, the fire having passed over them, they now find themselves surrounded by flames. In some cases escape is almost impossible, and a number of deaths may be the result. On the north fork of the Salmon River nearly all the cabins and shaft houses have been burned to the ground, together with large quantities of provisions and tools. It is learned that Rossland is in danger.

LATE NEWS.

(Special to the Engineering and Mining Journal.)

CRIPPLE CREEK, COLO.—BY TELEGRAPH, July 24th.—Anchoria let and shipped six cars last week

which netted \$11,500. One car sampled 18 oz., yielding \$6,400. To-day some of the richest specimens in the camp were broken from an east and west vein. Moon Anchor's net output for June was \$12,800. The Arcadia still shows well; the El Paso shows rapid improvement.

BRUNSWICK CONSOLIDATED GOLD MINING COMPANY.—The following is a report of J. J. Halpin, treasurer of this company, to the stockholders:

"Since April 15th the 800 ft. level has been extended 131 ft. and it is now in 155 ft., all in good ore. The upraise from the 800 is up 103 ft. The upraise is in good ore for the whole distance.

"We have milled during the month of June 224 tons of ore, the proceeds of which amounted to \$5,496. We have also taken out seven tons of sulphurets, the estimated value of which is \$700.

"At present only five stamps are being run, but arrangements have been completed to increase the number to 10 stamps and these will be running in a few days."

FOREST FIRE.—A strong wind in the mountains to the north of Spokane, Washington, has fanned the forest fires into raging walls of flame, which are sweeping across the mountains and down into the valleys with terrible rapidity.

Meager reports have reached the city of fires on the Colville Indian reservation. Only a few people have come down, and it is feared that many have met their death.

The United States Forestry Commission is in Spokane, coming for the purpose of inspecting the forests, but the visitors find they cannot go out on account of the fires. They estimate the damage from fires at many millions of dollars.

The strike situation at Leadville, Colo., is reaching a dangerous point, and it is believed that the city will yet be under martial law, the mine owners having asked the governor for protection. The striking miners are interfering with the operations of those properties that will not accede to their demands.

The strikers aggregate 2,000 men, well armed, who have picketed the streets and surrounding country, so that no new arrivals can be brought to the city without their knowledge. Signals have been arranged for the purpose of communicating with the strikers and mobilizing at any given point should there be any show of resistance on the part of the mine owners.

It is officially stated that the governor has decided to act, and that he has sent out an order for all members of the Colorado National Guard to be ready to move at a moment's notice.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 21.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending July 18th, 1896, compared with the corresponding period last year:

	1896.		1895.
	Week.	Year.	Year.
Pennsylvania Railroad.....	61,817	1,881,052	1,902,704

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending July 18th, and for years from January 1st, 1896 and 1895:

	1896.		1895.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	40,590	1,284,740	2,186,745
Barclay, Pa.....	945	22,875
Beech Creek, Pa.....	56,469	1,705,174	1,619,606
Broad Top, Pa.....	221,563	244,140
Clearfield, Pa.....	56,315	2,743,873	2,981,660
Cumberland, Md.....	92,613	2,044,979	1,673,486
Kanawha, W. Va.....	65,302	1,795,644	1,615,591
Phila. & Erie.....	782	38,738	29,303
Pocahontas Flat Top.....	67,053	2,083,645	1,094,045
Totals.....	380,169	11,901,628	12,043,976

* For week ending July 14th.

† Week ending July 11th.

	1896.		1895.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	20,427	564,532	476,924
Pittsburg, Pa.....	8,564	1,090,754	1,037,817
Westmoreland, Pa.....	27,436	1,080,971	1,024,219
Totals.....	56,427	836,257	2,532,960
Grand totals.....	436,596	12,737,885	14,576,936

Production of coke on line of Pennsylvania Railroad for the week ending July 18th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 73,441 tons; year, 2,435,603; to corresponding date in 1895, 3,067,274 tons.

Anthracite.

The summer season is well on now, and the anthracite market is naturally quiet.

The sales agents in July and August do not expect much business. Consumers do not seem to be in the buying mood, and according to the statements of those interested in the trade, the retailers have sufficient coal on hand to fulfill the demands of their customers for the present.

We understand that there is a shortage of Lehigh egg coal in both producer's and dealer's hands. One of the leading companies informs us that it has sold egg coal during the week at \$4.50, which is 50c. above the schedule price. One thousand tons are said to have been sold at this price.

Some of the Lehigh Valley Coal Company's mines have been working on full time during the past

week so as to make up its full monthly quota. It is not expected though that these mines will be so active next week or for some little time to come.

In the East some orders have been received for the domestic sizes of coal at the July circular. Not much change can be reported in the Western market and prices are not expected to advance on August 1st.

Some time ago we informed our readers that there was a probability of another advance in the price of coal by September 1st. Now it seems almost certain that this increase will be 25c. and will be made at the time mentioned.

The following f. o. b. prices are being quoted: Broken, \$3.75; egg, \$4; stove, \$4.25; chestnut, \$4, subject to the usual commission of 15c.

Bituminous.

The soft coal trade this week has not been particularly active, although the extremely low ocean freight rates have kept it from being dull. Most of the producers are holding tenaciously to their agreements as regards prices, etc., and are beginning to look forward to the fall trade.

A few contracts have been taken during the week, one from the Navy Yard, which was secured at the "Association" prices. In the beginning of the season some of the large consumers contracted for only about half of their full supply, believing that the combination would not be permanent. Now that they are realizing that this organization has come to stay, they are contracting for the remaining portions of their wants.

The greater tonnage of coal is going round Cape Cod, as usual, with the Sound ports taking comparatively little. New York harbor does not seem to change its tonnage much, but it continues with more regularity than the other consuming territories. Transient and spot business is very small.

All-rail trade is rather slack, which induces the salesmen in this line to ask for lower prices from the producers, but these are said to be refused them.

Trade local to the shipping ports is practically nil; the same may be said of South American business.

There has not been any meeting of the trade representing the Bituminous Coal Association for a week or so. Nothing of vital importance was done at the last meeting and it is not expected that anything will transpire for some time, as no meeting will be held until after the summer vacations. The Executive Committee of this organization though meets regularly to canvass the situation of the trade; that is all.

Transportation from mines to tide is fairly good and no complaint is heard in this direction. The car supply is all that the demand requires, though it is noticeable that the empty cars are not returned from the mines very promptly.

In the coastwise market, vessels are in good supply. The demand, on the other hand, is less and freights weak. The rates quoted are lower than they have been for the corresponding period in previous years. The reason of this decline is attributed to the fact that the vessel owners expect to cover their costs on their return trip from the ice ports, where they will load with ice.

We quote current rates of freight as follows from Philadelphia: To Boston, Salem, Portland and the Sound, 50c.; Wareham, 75c.; Lynn, 60c@65c.; Newburyport, 65c.; Portsmouth 55c.; Dover, 90c. and towage; Saco, 75c. and towage; Bath, 50c@55c.; Gardiner, 55c@60c. and towage; Bangor, 55c@60c. Some of these quotations have been cut 5c. to the principal ports in single instances. For Norfolk, Newport News and Baltimore, 5c@10c. above these rates are asked.

The Association prices remain as follows: F. o. b. Philadelphia, Norfolk and Newport News, \$2.35; Baltimore, \$2.28; New York Harbor shipping ports, \$2.80, alongside; New York Harbor, \$3. There is a 2c. differential in favor of Clearfield and Beech Creek coals.

NOTES OF THE WEEK.

The Norfolk & Western Railroad Company reports that it has placed in the tidewater markets during 1895, 1,789,191 tons of coal, a decrease of 634,746 tons as compared with 1894. The decrease was due to the coal strike. It is said that there was a market for much more coal in New York for steamship use than the company could supply. The company expects to exceed all its previous records in the tidewater market this year.

Buffalo.

July 23.

(From Our Special Correspondent.)

Little new in the anthracite and bituminous coal trade. The usual summer vacation of buyers and sellers is now occurring, hence the light business and lack of incidents.

Proposals for about 7,500 tons of anthracite coal were received by the Board of Works of Buffalo last week for the use of the public schools and the municipal building of our city. The figures were as follows:

For Public Schools: Jas. Hanrahan, \$4.05 grate; \$4.28 egg, stove and nut. L. Polakoff & Co., \$4.13 grate; \$4.37 egg, stove and nut. Donnelly, Dunham & Co., \$4.25 grate; \$4.49 egg, stove and nut.

For municipal building: Jas. Hanrahan, \$4.25 for egg and grate. L. Polakoff & Co., \$4.23 for grate; \$4.47 egg, stove and nut. Donnelly, Dunham & Co., \$4.26 for grate; \$4.39 for egg, stove and nut.

In addition, a proposal was made by Thomas Loomis & Co. to deliver 7,500 tons of Pocahontas smokeless coal at \$3.80 for lump and nut or broken, and \$3.65 for run of mine.

The prices of anthracite coal are as follows. For

2,240 lbs. on board vessels at Buffalo, \$4.86 for grate, \$5.95 for egg, stove and chestnut; for 2,240 lbs. delivered at Bridges, \$4.50 for grate, \$4.75 for stove, egg and chestnut; at retail for 2,000 lbs. delivered within city limits, \$5 for grate, \$5.25 for egg, stove and chestnut; \$4 for pea and \$4 for Blossburg.

Lake freight on coal unsettled; there is but little here for lake shipment and shippers will not pay higher rates. Vesselmen declare that they will tie up their vessels rather than let them go out with 30c. coal. The tonnage in port is quite large, so that there is little likelihood of an advance in freights at present.

The shipment of coal from Buffalo westward by lake, from July 12th to 18th, both days inclusive, aggregated only 57,285 net tons, distributed as follows: 21,000 tons to Chicago, 16,130 tons to Milwaukee, 6,700 tons to Duluth, 2,700 tons to Toledo, 1,000 tons to Gladstone, 1,200 tons to Bay City, 1,350 tons to Kenosha, 600 tons to Sault Ste. Marie, 1,000 tons to Green Bay, 1,005 tons to Saginaw, 1,000 tons to Racine, 600 tons to Manitowoc, 1,000 tons to Lake Linden and 2,000 tons to Ashland. The rates were lower, as follows: 40c@30c. to Chicago, 35c@30c. to Milwaukee, 40c. to Kenosha, Racine and Green Bay; 30c. to Lake Linden, Saginaw and Manitowoc; 35c. to Sault Ste. Marie, and 25c. to Duluth, Ashland, Bay City and Toledo. Closing dull and heavy; coal for shipment scarce.

The movement of coal through the Sault Ste. Marie canal from the opening of navigation to July 1st this year was 831,403 net tons of bituminous and 136,191 net tons of anthracite; in 1895, 229,757 and 81,304 net tons respectively; and in 1894, 59,724 and 187,751 net tons. Totals in 1896, 967,594 net tons; in 1895, 311,061 net tons; and in 1894, 247,475 net tons.

The New York Central Railroad contract for a million tons of bituminous coal has been let on a basis of \$1.38 at Buffalo, or possibly \$1.40. This contract "has caused much ill-feeling among the trade," says a dealer, and "the comments upon the subject are anything but nice."

The contract for the construction of the pole line for the transmission of electric power from Niagara Falls to Buffalo will be let this week, and will have to be completed by November 15th, this year.

"It is certain that the company will be delivering electricity in Buffalo by the end of November," says Manager Rankine, "probably 1,000 to 1,500 H. P. It will be the first instalment of our 10,000 H.-P. contract."

Pittsburg.

July 23.

Coal Trade.—The July rise arrived on time and was followed by a shipment of 6,250,000 bushels, employing 205 coal boats and 104 barges; destination principally Louisville, where tons are made up for the Southern and Western ports. Cincinnati seems to have less demand for Pittsburg coal than formerly. The Walton mines in the first and second pools have closed down for the present; the company states that it has not cut miners' wages. At the miners' meeting at Monongahela City, resolutions were adopted expressing the belief that only by united action can present prices be continued; several miners are working at reduced prices. Most of the mines are closed for the want of empties; some mines are running from two to three days a week to get out entry coal; the miners are anxious to get all the work they can. The conditions in the railroad coal trade show no improvement; operators continue to complain. The mining rate is altogether demoralized, and the cutting of prices to get trade appears to be the order of the day.

Report says that the New York Central contract for 400,000 tons has not yet been awarded for this reason and that other business is still being held in abeyance. Captain W. W. O'Neil, excellent authority, says that the markets of the South and West are overstocked with Pittsburg coal and that the inferior Kanawha River article is underselling the Pittsburg article.

The heavy rains caused a big flood in the Monongahela and other mines there is no coal loaded, hence there will be no shipment.

Connellsville Coke.—The heavy rains in the coke region have been a blessing to the coke companies and other operations that use water for steam power. In previous summers the Youghiogheny River, which is merely a sulphur creek below Connellsville, became so low and so thoroughly a mere drain for the sulphur streams from the mines that the water became almost useless. This difficulty was followed with more than the usual unhappy results. The plants along the river and back from below Broad Ford were the greatest sufferers; Laughlin, Jackson, Adelaide and other coke plants received permanent injury from the continued low water. The coke trade made good gains in volume; business was quite good. The time for the midsummer shut-down is drawing to a close; the mills will soon be in operation and a better trade is promised. The reduction in freight rates has already had a good effect; there is now no talk of a reduction in coke prices.

Summary of the coke regions shows 10,312 ovens in blast and 7,635 idle; there are no decided changes arranged. The production of the region for the week amounted to 100,905 tons; increase, 2,281 tons. In the running order of the mines in blast 4,952 made six days; 5,290 five days and 70 four days, an average of 547 days, as against 510 days the week previous. Week's shipments amounted to 5,922 cars distributed as follows: To Pittsburg and way points, 1,998 cars; to points west of Pittsburg, 3,070 cars; to points east of Pittsburg, 954 cars; total, 5,922 cars.

GREENSBURG, July 22.—The first shut-down by the Southwest Connellsville Coke Company occurred to-day, when 300 ovens were blown out at Mine-wood, throwing a large number of men out of employment.

Shanghai, China. June 19.
(Special Report of Wheelock & Co.)

Coal.—The trade in Japan coal is in a very unsatisfactory state; the natives do not wish to operate as the stocks of inferior quality are so large that it is impossible to maintain the price of the consumable article. Then again Japan has increased her prices owing to some of the mines being partly flooded. Cardiff sprung suddenly into demand, and a fair business resulted, a good quantity changing hands, but at the close it is somewhat quiet. In Sydney Wollongong we can only reiterate the remarks of our last circular that everything is very weak, natives having no inclination to do business. The deliveries have fallen off very considerably. We quote; 9'00 tael per ton for American anthracite; 10'50 tael for Welsh Cardiff; 9'00 tael for Australian Wollongong. Japan coal is quoted at 5'75 tael per ton for Takasima lump, 4'25 tael for Namazuta lump, and 3'00@3'25 tael for other sorts.

Kerosene Oil.—There has been a limited business done during the period under review at much easier rates, but all transactions have been among the native dealers, first hands doing nothing worthy of record. There have been arrivals of 198,000 cases of Devoe's, making a total of 480,000 cases of this oil in stock. We estimate stocks of Russian at 120,000 cases; Comet, 27,000 cases and Langkat, 17,000 cases. Quotations are as follows per case: American Devoe's, 1'60 tael; Russian Batoum bulk, 1'52½ tael; Comet, 1'57½ tael; Langkat, 1'55 tael.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 24, 1896.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	July 26, 1895.	July 21, 1896.	Jan., '95.	Jan., '96.	Tons.	Tons.
Anthracite.	39	21,501	39	21,100	621,778	768,640
Coke...	133	142,804	130	155,950	4,081,456	4,690,214
Charcoal...	17	3,731	23	6,600	11,486	153,325
Totals	189	168,036	192	186,650	4,821,740	5,616,179

The market continues very dull and there has been hardly anything worth noting. No change can be reported in the attitude of buyers, but there are some signs of weakening on sellers' part. The steel billet pool will hold a meeting on July 31st, and it is reported that there is some dissension, which will show at the meeting.

The railmakers at their meeting last week decided to make no changes in price. The reports as to orders and deliveries were not all satisfactory.

New York. July 24.

The local market is still very quiet, and no new business of importance is noted. There is a good deal of irregularity in some quarters, and the pig iron market is almost demoralized. The structural market is the only section showing any activity, and there is very little news there. The question of the big Brooklyn pipe contract is not yet decided.

Pig Iron.—No improvement manifested itself in the pig-iron market since our last report; enquiries continue light, and the prospects for immediate sales are not encouraging. A number of additional furnaces are reported as having gone out of blast in the Mahoning Valley and Pittsburgh region. The stock of iron on hand is heavy and several of the large buyers would take advantage of this and place good orders, but the furnace people are not quite ready to sell below cost of manufacture, preferring to hold back and wait for the advance that is sure to come.

Latest quotations are for tidewater delivery. No. 1 Northern, \$12@13; No. 2 Northern, \$11.75@12.25; No. 2 plain, \$10.75@11; gray forge, \$10.75@11. No. 1 Southern we quote \$11.25@11.50; No. 2 Southern, \$10.75@11; No. 3 Southern, \$10.50@10.75.

Cast-Iron Pipe.—Aside from the closing of the Fifth avenue contract, there is nothing special to report.

Spiegeleisen and Ferro-Manganese.—Market is extremely quiet, and no sales are reported. Prices are unchanged at \$19.50@20 per ton for foreign spiegeleisen and \$47@47.50 for ferro.

Steel Billets and Rods.—No change in price reported, and little or no demand. Prices are unchanged at \$21.75, and rod \$27, New York delivery.

Merchant Iron and Steel.—Only small business being done and prices unchanged. We quote for common bars 1'10@1'20c.; refined bars, 1'25@1'50c.; soft steel bars, 1'25@1'35c. Other quotations are: Steel hoops, 1'50@1'60c.; steel axles, 1'65@1'80c.; links and pins, 1'65@1'75c.; tire steel, 1'80@1'95c.; spring steel, 2@2'20c. All prices are for delivery on dock, New York.

Plates.—The demand for plates is extremely light, and no orders of any magnitude are in sight. Prices are unchanged and are quoted as follows: Universal mill plates are 1'45@1'55c. For other sorts we quote: Tank 1'40@1'50c.; boiler shell, 1'45@1'55c.; good flange, 1'65@1'75c.; firebox, 2@2'40c. Charcoal iron plates are 2'25c. for shell, 2'75c. for flange, and 3'25c. for best firebox. Rivets are 2'15@2'25c. for steel and 3@3'25c. for iron.

best firebox. Rivets are 2'15@2'25c. for steel and 3@3'25c. for iron.

Structural Iron and Steel.—No new contracts reported, but the outlook for the fall building trade is good. The mills are maintaining prices, which are quoted as follows: Angles, 1'45@1'50c.; channels, 1'70@1'80c.; tees, 1'60@1'65c.; beams, 1'70@1'80c. in quantities, with a slight advance for small lots.

Wrought-Iron Pipe.—The market remains unchanged. Prices out of store are as follows, with the usual shading for large quantities at mill: Butt black, 57, 10, 10, 10; lap black, 67, 10, 10, 10, 10; butt galvanized, 52, 10, 10, 10, 10; lap galvanized, 55, 10, 10, 10, 10.

Nails.—The mills report business as quiet and no change in prices. Quotations are: Wire nails, \$2.55 per keg; cut nails \$2.30 per keg f. o. b. Pittsburg, in carload lots.

Steel Rails and Rail Fastenings.—No business is reported from the mills. An inquiry from the South for 20,000 tons went the rounds of the market during the week, but the terms of payment were not satisfactory to the mills and it is doubtful if the order comes to this market.

Prices remain as last quoted: \$28.75 per ton at tidewater, with girder rails \$28@33, same delivery. No change in rail fastenings.

Old Rails.—No sales are reported and business in old rails is extremely quiet. Prices are unchanged at \$11@12.50, New York harbor delivery or Sound port. Old rails for relaying purposes still hold at \$19 to \$22, New York delivery. Old iron rails, \$13.50@14 f. o. b. New York.

Scrap Iron.—Demand and prices remain the same as last reported. Good machinery scrap, \$10@11.50 per ton; ordinary cast-iron scrap, \$9@10; stove-plate and mixed, \$6@7.50.

NOTES OF THE WEEK.

The Western Foundrymen's Association has authorized a series of experiments on the action of silicon, phosphorus, sulphur and manganese on cast iron. They will be conducted under charge of a committee consisting of A. Gorge, Jr., Malcolm McDowell and John K. McKenzie.

The Association of American Steel Manufacturers held a meeting at Atlantic City, July 17th and 18th. At this meeting chemical requirements were added to the standard specifications for structural and plate steel and a number of other changes and additions were also made. These revised specifications, the result of much thought and discussion on the part of the members of the association, were adopted.

At the next meeting, which will be held in New York on October 17th and 18th, among other topics discussed will be whether the association shall adopt as its standard a decimal system of gauging—namely, in hundredths and thousandths of an inch—or the United States standard gauge, legalized by act of Congress March 3d, 1833, and now in general use by the sheet manufacturers of the country.

Buffalo. July 22.

(Special Report of Rogers, Brown & Co.)

Quietness prevails throughout all branches of the iron business in this district. Sales have been a little heavier than for some time past, but nothing as it should be at this time of the year. Cast scrap is scarce, and foundries using a large percentage of this material have purchased certain grades of pig iron to take its place. Consumption of foundry iron averages about the same. Some have increased their consumption, while with others it has decreased. We quote on a cash basis f. o. b. cars Buffalo as follows: No. 1 foundry strong coke iron, Lake Superior ore, \$13; No. 2 foundry strong coke iron, Lake Superior ore, \$12.50; Ohio strong softener No. 1, \$13; Ohio strong softener No. 2, \$12.50; Jackson County silvery No. 1, \$15.25; Southern soft No. 1, \$12; Southern soft No. 2, \$11.50; Lake Superior charcoal, \$14@14.50.

Cleveland. July 22.

(From Our Special Correspondent.)

Iron Ore.—That some sales have been made during the past week below the recognized standard price, is asserted by some of the dealers. The shippers say, however, that they do not fear a slump in prices, and they seem to be of the opinion that the market will right itself in a few weeks at most. A telegram received in this city from Ishpeming, Mich., states that the ore shipments from Lake Superior and Lake Michigan ports up to June 30 exceeded the heavy shipments of last year by half a million tons, and that the purpose appears to be to get rid of the ore on hand, and to have nothing left in case a slump in prices should come. The Cleveland dealers and shippers say the heavy shipments were for the purpose of getting the ore near the market. The quotations are the same this week as last week, although, as has been said, some sales were made without regard to the standard price. Standard Bessemer are firm at \$4; standard non-Bessemer hematites are held at \$4 and \$3.25, and Mesabi non-Bessemer at from \$2.40 to \$2.60.

The lake freight rates are the same this week as last week. The vessel owners are making an effort to null the rate, but so far their efforts have proved unsatisfactory in that direction.

Pig Iron.—No change has been made in the market during the past week. The quotations are: Lake Superior charcoal, \$13.50@14; bituminous

coke No. 1, foundry, \$12.25; No. 2, \$11.75; Ohio Scotch, No. 1, \$12.25; No. 2, \$11.75; Bessemer pig, \$12.25.

Philadelphia. July 23.

(From Our Special Correspondent.)

Pig Iron.—Something akin to fright has shown itself in the pig-iron trade this week, owing, some brokers say, to the scare over the rapid outflow of gold. Yesterday there was a little recovery. Part of the bad feeling grows out of efforts of large makers to induce certain buyers to purchase large lots of pig, some from the South. Brokers think the accumulation of stocks has reached a point where there is likely to be a further rush to realize. Things look worse than last week, but some long-headed people have not given up the belief that there will be an early fall reaction and heavier consumption. No. 1 is \$13; No. 2, \$12; forge, \$11; Bessemer, \$13.

Billets.—Until after next week's New York meeting there will be nothing to say. Despite the greater anxiety to sell and weaker prices very little business is done. There is more "shaky" talk this week. The market is disturbed by rumors and apprehensions.

Merchant Bar.—Production here is still greatly restricted, and is not likely to return to June proportions for some weeks. Manufacturers are scouring the market for the larger class of orders, and prices are being worse shaded than ever. Steel bars sell well. Store stocks of iron and steel are now being increased.

Skelp.—The market is quiet. Some quotations must be made to keep pace with Western manufacturers, who have taken some very cheap work lately.

Sheets.—Just at this time there is considerable activity in galvanized iron and customers are considering the advisability of placing large fall and winter orders.

Pipes and Tubes.—Iron and steel pipe is dull and weak and no sales have been heard of for several days. Reports are lacking from two or three pipe mills in the interior. Local pipe interests say the fall trade will come out all right unless some very unusual thing happens.

Merchant Steel.—Manufacturers have met with an improving demand during the past few days, and are doing a good business in certain lines, especially in malleable work and heavy hardware. In shell and builders' hardware there is nothing to report. Prices are low, but manufacturers look for a hardening soon under a heavy Western demand, the effect of which will be reflected East.

Plate.—The iron and steel plate makers did no important business this week. Prices are steady. Brokers deny that asking or selling prices have anything to do with the slow coming in of fall orders.

Structural Material.—Expected mid-summer business is not arriving as manufacturers expected. There is much work in sight. One or two mills are crowded, as to deliveries promised to be made before August 1st.

Steel Rails.—Quotations continued at \$28 at mill.

Old Rails.—No business.

Scrap.—Car wheels and axles are wanted. Most other kinds are dealt in very sparingly.

Pittsburg. July 23.

(From Our Special Correspondent.)

Raw Iron and Steel.—Business during the week has continued generally unsatisfactory; fears about the monetary future have retarded improvement in all directions and in most departments merchants have limited operations to immediate requirements. Speculative markets have been unsettled. The iron and steel trade seems to be in somewhat better condition than it was, owing to the withdrawal from the market of many producing concerns that do not care to compete for business on the present low level of prices. The prolonged shut-down of Western mills will help the finished material branch of the business and a slightly firmer tone seems to prevail all through the trade except in certain branches and probably the pig-iron market. There is still much complaint at the small volume of business, but little improvement in this particular is expected—not until the political situation is more settled. The effort made in Philadelphia to organize a pig-iron association has not proved successful as yet and some doubts are entertained whether any such agreement can be accomplished.

For steel billets demand was extremely light. The pool seems to have suspended business for the present, as no sales are recorded above \$19.75, with other sales as low as \$19.25. There is a wide difference of opinion as to whether the pool prices will be maintained when the fall trade opens. The middlemen still have stock for sale. Production of pig iron has been further curtailed, with many furnaces reported as preparing to close down. There are still too many furnaces in operation, and the sooner the fact is realized it will be better for all parties concerned. There are several new furnaces being constructed that will be world-beaters; one is now in operation, turning out 1,000 tons pig iron daily; another will be running in October of the same capacity, their combined output being 2,000 tons daily. In this vicinity there is being constructed, and will be completed in a short time, an open

For refined and manufactured we quote: English Tough £51 10s. @ £52; Best selected, £52 5s. @ £52 15s.; Strong sheets, £50 @ £50 10s.; India sheets, £56 @ £56 10s.; Yellow metal, 5 1/2 d.

Business in refined sorts has been very dull indeed. The trade was somewhat alarmed by the political situation in the United States, and fears are entertained that exports of copper will increase. For that reason, buyers have held back, but consumption from all centers is reported to be very good.

Tin continues to enjoy a good consumptive demand, but in sympathy with London, prices have given way somewhat, and we quote for spot and August 13 65 @ 13 75.

In London the opening price this week was £61, but since then, values have given way somewhat, and they close £60 10s. for spot and £61 for three months prompt. Shipments from the East will again be heavy this month, and it is anticipated that they will be as large as at the same time last year.

Exports of tin from the Straits Settlements for the five months ending May 31st were, in tons of 2,240 lbs.

Table showing tin exports from Straits Settlements for five months ending May 31st. Columns: United States, Europe, China, India, Total. Rows: 1894, 1895, 1896.

The increase in direct shipments to the United States is notable.

Chilean Copper Market.—Messrs. Jackson Bros. write from Valparaiso, under date of June 20th: Smelters on this side have taken advantage of the rise, and our sales are again above the average. Sales for the fortnight have been 18,475 quintals. We quote for bar copper, f. o. b., \$71.74 (Chilean) per metric quintal; regulars, 50%, \$21.52 per metric quintal; copper ore, 10%, \$3.49 per metric quintal.

Lead continues very dull with more sellers than buyers. Consumption is not what it ought to be, and there is considerable pressure from certain quarters. We have to quote the market 2 1/2 @ 2 1/2 New York, with sellers over at the last price. The western markets are also flat at 2 67 1/2 @ 2 70 St. Louis. In spite of these low prices, very little desire is shown on the part of consumers to enter the market to any large extent. The London market is barely steady at £11 @ £11 1s. 3d. for Spanish and 5s. higher for English.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Market here is dull, no doubt owing to the general dullness prevailing in the seaboard territory. Nominal value 2 67 1/2 for common, and 2 70 for corrodng.

Spanish Lead Market.—Messrs. Barrington & Holt write from Cartagena, Spain, under date of July 3d: The average quotation for June has been 56 60 reales per quintal of lead, which, at present rates of exchange, is equivalent to £10 11s. 8d. per long ton, the silver being paid at the rate of 15 reales per ounce. Imports of piglead for June have been: 2,494,004 kg. to Marseilles; 2,792,628 kg. to United Kingdom; 316,454 kg. to Antwerp; total, 5,603,176 kg., of which 648,480 kg. were desilverized lead. For lead ores we quote 8s. 9d. per cwt. for Potter's ore; 6s. 9d. for Linares sulphides and 4s. 6d. for Linares carbonates.

Spelter.—The demand remains very poor, and, in consequence, prices have again given away slightly. We have to quote 3 95 @ 3 97 1/2, delivered New York. Very little business has been done.

The market abroad has given way and good ordinaries are quoted £17 5s. @ £17 7s. 6d. and specials 2s. 6d. more.

Antimony remains dull without any quotable change.

Nickel.—Business is rather light, but prices are firmly held, and we continue to quote 34 @ 35c. per lb. for ton lots and 35 @ 36c. for smaller orders. London prices are 13 1/2 @ 14 1/2 d. for large orders and 14 1/2 @ 16d. per lb. for small lots. The New York price is on a parity with London, allowing for the United States duty of 6c. per lb. on the metal.

Platinum.—Demand is steady and prices are again a little higher, say \$14.50 @ \$15.50 per oz., New York. London quotations are 57s. 6d. @ 59s. per oz. For chemical ware, best hammered metal, Messrs. Elmer & Amend, New York, furnish the following quotation, 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, 50c., 5c. and 52c. per gram. Wire and foil are 47c., 48c. and 49c., per gram. The current retail price for crucibles is 60c. per gram.

Quicksilver.—The price is unchanged at \$35.50 per flask, New York. The London quotation is also unchanged at £6 7s. 6d. per flask, with the same price from second hands also.

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

Table listing prices for minor metals: Aluminum, Iron, Steel, Lead, Zinc, Tin, etc. Columns: Metal, Price per unit.

Tungsten, pure, powder per lb. 70c. Tungstic acid, per lb. 45c. Ferro-tungsten, 60% in ton lots, per lb. 60c.

Average Monthly Prices of Metals

In New York since January 1st, 1895, and for the corresponding periods in 1895, 1894, 1893 and 1892, in cents per pound.

Large table showing Average Monthly Prices of Metals from 1892 to 1896 for Copper, Tin, Lead, and Spelter.

Imports and Exports of Metals.

Table showing Imports and Exports of Metals for New York, Week of July 16, 1896, and Year 1896.

* Metal Exchange Reports. † Week ending July 23. ‡ Includes 15 tons exported from Newport News.

Philadelphia, ††

Table showing Imports for Philadelphia, Week of July 16, 1896, and Year 1896.

†† From New York Metal Exchange Reports.

Baltimore, **

Table showing Imports for Baltimore, Week of July 14, 1896, and Year 1896.

** From our special correspondent.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, July 24.

Heavy Chemicals.—There has been no improvement in the heavy chemical market during the week; it practically remains as last reported—quiet. Those in the trade attribute much of the dullness prevailing in the market to political agitation, but it is also, no doubt, owing to the holiday season. Trade in bleaching powder is merely of a hand-to-mouth character outside of the regular yearly contracts, and prices are said to remain unchanged. Alkali is in sympathy with the quiet state of the whole chemical market; hence there is nothing new to report. The negotiations pending among the domestic makers of alkali have not fully developed as yet in regard to the proposed arrangement to improve prices, but it is intimated that a satisfactory understanding will doubtless be arrived at soon. The sodas have been in some demand, but not to such an extent as would indicate that the consumers were coming into the market more freely than usual. Prices show little or no change, and are as quoted below. Caustic soda, 60%, \$2.22 1/2 @ \$2.42 1/2; 70, 74 @ 76%, \$2.12 1/2 @ \$2.37 1/2 per 100 lbs. Alkali, 58%, 80 @ 85c. for 50-ton lots and over, and 90c. @ \$1 for smaller quantities; 48%, \$1.20 @ \$1.40 for jobbing lots. Bleaching powder, prime brands, \$1.87 1/2 @ \$1.90; Continental, \$1.70 @ \$1.80 per 100 lbs. Bicarb. soda, English, 1 1/2 @ 1 60c.; American, bulk, \$1.50 @ \$3.50 per 100 lb. Sal-soc 2, English, 70 @ 72 1/2 c.; American, 65c. (in barrels), 80c. (in kegs) per 100 lbs.

Acids.—A market like this which displays severe competition for what little business is doing at this season of the year cannot be said to be in a very satisfactory condition. There is a constant shopping by consumers generally for low prices. The fact is acid manufacturers have been obliged so far to yield to the demands of these people in order to keep their trade, but they are trying to devise plans by which the present conditions will be improved. The smaller concerns have called meetings and invited the larger manufacturers to attend, but it is evident that nothing of importance has yet been done. We are aware of the fact that the acid manufacturers have been accustomed to cut prices wherever they could to secure business, but the figures that are now being quoted on some orders are said to be rock bottom prices. At the present time we cannot see how any satisfactory agreement can be made among the acid manufacturer, as each tries to underbid the other to get his trade. Prices are as follows: Acetic acid (in barrels), \$1.25 @ \$1.40; muriatic acid, 18%, 75c.; 20%, 75 @ 85c.; 22%, \$1.10 @ \$1.25, according to make and quantity. Nitric acid, 30%, \$3.25 @ \$4.30; 40%, \$4 @ \$4.50; 42%, \$4.50 @ \$5.50. Oxalic acid, 37.25 ex-dock and 37.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 68%, 75 @ 85c., 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 efforts of the Societa Anglo-Siciliana to secure the abolition of the export tax on sulphur have been fruitful, inasmuch as the Italian Parliament has granted the request of this trust. The cable advice states that there will be no duty on the export of Sicilian after October 1st. It is believed that the combination will adhere to its agreement with the mine owners and producers to give them the benefit of the export tax. The prices quoted this week for sulphur are nominally \$19.25 for best unmixed seconds and \$18.50 for thirds.

Fertilizing Chemicals.—No new features have developed in this market during the week, as there were no large inquiries to show that people are preparing for the spring season. The usual summer dullness confronts us, so we cannot expect much activity in the fertilizer market at this time of year. There has been no change in either blood or tankage. We quote: Sulphate of ammonia, gas liquor, \$2.27 1/2 @ \$2.30; bone, \$2.10 @ \$2.15. Dried blood, high grade, \$1.40 per unit f. o. b. Chicago. Azotine, \$1.60, basis New York. Concentrated phosphate (30% available phosphoric acid), 60c. per unit. Acid phosphate, 13% @ 15%, av. P2O5, 54 @ 65c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P2O5, 37 1/2 @ 90c. per unit. Acidulated fish scrap, \$1.00 @ \$1.11, and dried scrap with few or no sales, nominally \$16.50 @ \$17.50 f. o. b. fish factory. Tankage, high grade, \$19 @ \$21; low grade, \$18 @ \$19. Bone tankage, \$21; ground bone, \$22 @ \$22.50. Bonemeal, \$19.50 @ \$23.

Sulphate of Potash: 90-95%, New York and Boston, \$1.96 1/2; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 48-53%, New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk, \$1.02; Southern ports, \$1.03 1/2.

Muriate of potash: The new prices are 1 7/8c. at New York and Boston; 1 79 1/2c. at Philadelphia, Baltimore and Norfolk, and 1 81 1/2c. at New Orleans for 80 @ 85% (basis of 80%), in lots of 50 tons and upward.

Kainit.—Quotations for 1896 are as follows: New York, Boston, Philadelphia and Baltimore, \$8.80 per ton; Norfolk, \$9.15, and New Orleans, \$9.30 per ton, for 25 tons and upward. Sylvinit at the same ports is quoted at 36 1/2c., 37 1/2c. and 38c., respectively.

Nitrate of Soda.—Quotations are: 1 77 1/2c. for spot, and 1 80 for futures, according to position.

Shipments of phosphates from Florida for the six months ending June, 1896, were as follows:

Table with 3 columns: Port, Tons, Grade (Pebble, Rock). Rows include Brunswick, Ga., Fernandina, Fla., Port Tampa, Punta Gorda, Savannah, Ga., and a Total row.

As will be seen by the table above the shipments of pebble phosphate exceeded those of rock by 1,604 tons.

Liverpool, July 14.

(Special Correspondence of Joseph P. Brunner & Co.) There is no change in the position of heavy chemicals, and trade all round is very slow.

Soda ash in limited request at late rates. We quote spot range for tierces as to market about as follows: Lebanc ash, 48%, £4@£4 5s. per ton; 58%, £4 5s. @ £4 10s. per ton, net.

Caustic soda meets with an indifferent demand, while quotations are nominally unchanged. We quote spot range as to market as follows: 60%, £6 5s. @ £6 7s. 6d. per ton; 70%, £7 5s. @ £7 7s. 6d. per ton; 74%, £8 5s. @ £8 7s. 6d. per ton; 76%, £9 @ £9 5s. per ton, net cash.

Bleaching powder flat and prices nominal, ranging from £6 15s. @ £7 5s. per ton, net cash, for hard-wood packages; as to destination.

Chlorate of potash neglected, and 4 3/4 d. @ 4 1/2 d. is about spot value.

Bicarb. soda is unchanged, and selling at £6 15s. per ton, less 2 1/4% for the finest quality in 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia in limited supply, and quoted at from £8 5s. to £8 10s. per ton, less 2 1/4% for good gray, 2 1/2% @ 2 1/2% in double bags f. o. b. here, according to quality.

Nitrate of soda steady at £8 2s. 6d. @ £8 5s. per ton, less 2 1/4% for double bags f. o. b. here, as to quality.

Carb. ammonia, lump, 3d. per lb.; powdered 3 1/4 d. er to., n et cash.

Valparaiso, Chili, June 20.

(Special Report of Jackson Brothers.)

Nitrate of Soda.—No improvement has taken place in Europe for prompt shipments of this article, although a better feeling has prevailed for next Spring deliveries. A few sales of June, July 9 1/2% were made at the commencement of the fortnight at 5s. 6d. @ 5s. 7d. for chartered vessels, and some parcels of August and November fetched 5s. 9d., but after the meeting of the combination held June 18th, when it was declared that to comply with the total exports of 20,300,000 quintals for the year April 1st to March 31st, 1894, the quota to be assigned to each oficina would probably not exceed 35% of their productive power, an unexpected demand set in on the part of some speculators and producers, 5s. 9 1/2 d. @ 5s. 10 1/2 d. being paid for July and August, and 5s. 10 1/2 d. @ 5s. 11d. for September and October delivery, the transactions effected being mostly resale. As these prices are not in harmony with European values exporters have not followed the movement. The market closes quieter with sellers of June and July 9 1/2% @ 5s. 9d., August 5s. 10 1/2 d., and September and November 5s. 11d., the refined quality being held for 6s. July and August shipment. The prices of 5s. 9d., with 2s. 6d. all around freight stands in 7s. 7 1/2 d. per cwt net cost, and freight without purchasing commission against quotations of 4s. 2 1/2 d. Reported sales are 830,000 quintals.

MINING STOCKS.

Complete quotations will be found on pages 91 and 95 of mining stocks listed and dealt in at:

Table with 3 columns: Location (New York, Boston, Philadelphia, Baltimore, Pittsburg, Denver, Colo., Chicago and Cleveland), Company Name (Aspen, Colo., Colorado Springs, Duluth, Minn., Helena, Mont., Salt Lake, Utah, San Francisco, St. Louis, Paris, France, Mexico, Shanghai, China, Valparaiso, Chile, London, England), and Price.

New York, Friday Evening, July 24.

The mining stock market this week showed no reflection as to the intentions of either the investing or speculating public; hence there was but little buying and selling. The dullness day in the week was Tuesday when but one stock was dealt in. Saturday and to-day recorded the sales of only four stocks, while Monday showed transactions in six stocks; Thursday in eight and Wednesday, the most active day in the week, that of 11 stocks. Then again the volume of business done amounted to only 8,550 shares, which was less by 6,500 shares as compared with last week.

The Comstocks were very quiet and exhibited a downward tendency in price. The following stocks show sales: 300 shares of Sierra Nevada at \$5@57c.; 100 shares of Chollar at \$1.95; 200 shares of Consolidated California & Virginia at \$1.70@1.65; 100 shares of Hale & Norcross at \$1.25; 200 shares of Occidental at 80c.; 200 shares of Potosi at \$1.05, and 300 shares of Savage at 70c.

Of the California stocks we note sales of 200 shares of Union Consolidated at 45c.; 200 shares of Bodie Consolidated at 50@55c., and 300 shares of Brunswick Consolidated at 18c.

The Colorados were the most active of all the stocks that have been dealt in during the week. Of the Cripple Creek stocks Victor records dealings of 150 shares at \$7@87.25; Cripple Creek Consolidated, 1,400 shares at 12c.; Creede & Cripple Creek, 2,000 shares at 4@5c.; and Pharmacist, 800 shares at \$@ 10c. Of the other Colorado stocks there were sales of 200 shares of Lacrosse at 8c.

Bedford Consolidated, the Montana prospect, was not dealt in as heavily this week as it was last, although better prices were realized. The sales made amounted to 1,400 shares at \$2.80@3.10.

Boston, July 23.

(From Our Special Correspondent.)

The copper stocks have fallen in sympathy with the general decline in the market, and many weak holders have been forced to liquidate, causing a slump in prices, especially in the speculative list, and even the dividend-paying stocks show marked declines. Boston & Montana sold ex-dividend at \$78, and declined same day to \$74 1/2; a rally followed to \$77 1/2, another decline to \$75 1/2, and a further rally to-day to \$78 1/2, with the closing price \$78 1/2. Old Dominion has been active, and under free selling was forced out from \$13 to \$10 1/2, recovering to-day to \$13 1/2, and holding quite firm. Calumet & Hecla sold at \$299, but recovered to \$300 with small offerings. Quincy declined to \$109 1/2, but on the announcement of a dividend of \$4 per share, and \$2 extra, making \$14 paid this year, the stock rallied and sold up again to \$112 1/2. The total amount of dividends distributed by the company aggregate \$8,370,000.

Tamarack declined from \$78 to \$74, but rallied in later dealings to \$77. Osceola touched \$21, the lowest point, rallied to \$23 and closed at \$22. Atlantic sold at \$16. Kearsarge declined to \$9 1/2, with later sales at \$10. Tamarack, Jr., sold at \$3, same as last week. Wolverine steady at about \$7. The report of the company is considered very favorable. Butte & Boston sold at \$1 1/2 and \$1 1/2, and Tecumseh at \$2. The gold stocks have been very quiet, with only few transactions. Pioneer sold at \$4 1/2, and declined to \$3 1/2. Santa Isabel rallied from \$7 1/2 to \$9. Gold Coins advanced to 50c. on report of a dividend of 10c. per share on the new stock. Merced sold at \$3 1/2 for a small lot.

Chicago, July 22.

The following table gives the highest prices with sales of the stocks recorded on the Chicago Mineral and Mining Board for the week ending July 22:

Table with 8 columns: Stocks, July 16, July 17, July 18, July 20, July 21, July 22, Sales. Rows include Capazone, C. C. & C. C., C. C. & C. C. Group, C. C. G. M. B. & L. Co., Chi. & G. M. L., Chi. & Mont., Christmas, Chula Vista, Cosmocon, Delaware Co. Finance, Great Pressure Hawkeye, Imperial Pfd., Investors' and Prospectors', Lion's Gold, Little Gea., Lucille, Medina G. M. Co., Michigan Gold, Peerless G. M. Co., Rhyolite, Royal Age, San Pedro, Squaw Mt., Sumpter, Sunnyside, Galpin, Union Gold, Utah Mercur.

Total shares sold, 518,400.

Colorado Springs, July 18.

(From Our Special Correspondent.)

It would seem as though the bearish feeling which existed in the mining stock market last week had something to do with the business this week, as some of the stocks exhibited a further downward tendency in price. Some brokers say that the entire list of stocks broke early in the week, and were practically unchanged at the close, while another brokerage concern takes a more optimistic view of the situation, and says that the market opened and closed strong.

The Golden Fleece Mining Company has issued its monthly statement for June which shows the total receipts to be \$33,790 from ore shipped. The total expenses were \$16,576, leaving a profit of \$23,214. After paying the forty-third dividend of \$18,000, the surplus in the treasury on July 15th was \$33,514; an increase of about \$5,300 as compared with June 15th.

I understand that the Gold & Globe Mining Company will pass its dividend this month. This company has placed in its treasury the sum of \$2,500,

which is the monthly dividend accruing from the shares of stock which it holds of the Moon-Anchor Mining Company.

Business progresses moderately at both the Colorado Springs exchanges.

Cleveland, July 22.

(From Our Special Correspondent.)

The condition of the market during the past week has been quiet, although a few small sales have been made. The largest sale reported was of Lake Superior Iron Company stock. The brokers say that many inquiries have been made for good stocks, but hesitancy is shown in investing on account of the discussion of the financial question. Following are the quotations:

Table with 4 columns: Name of Company, Par val., Bid., Ask. Rows include Adams, Aurora, Bwabik, Champlain Iron Company, Chandler, Clark, Cincinnati Iron, Cleveland-Cliffs Iron Co., Jackson Iron Co., Lake Superior Iron Co., Lake Superior Consolidated, Mesabi Chief, Mesabi Mountain, Minnesota, Mountain, Pittsburg & Lake Angeline, Republic Iron Co.

Salt Lake City, Utah, July 18.

(Special Report of James A. Pollock.)

The usual mid-summer quiet now prevails in the local mining stock market, and the advice previously given that this is a far better time to buy than to sell, especially with the dividend payers, still holds good. Business was only fairly active during the week, with prices about the same as during the previous same period.

Ajax is reported to be looking exceptionally well, and shipments from the properties are quite satisfactory. The stock made little change, although toward the close there was a somewhat increased demand. Anchor continued to show a slight improvement, and closed considerably higher than it has been since the properties were closed down. The prospecting going on in the mines is reported to be making a good showing. Bogan continued dull. Bullion-Beck pays its July dividend on the 20th. The stock was quite strong and in fair demand, although the quotations were not materially changed.

The option on the Centennial-Eureka properties at \$3,000,000 was not taken up. This fact has not to date had any depressing influence upon the market value of the stock, which is still held very strongly, the offerings being very limited. The usual dividend of \$1 per share was paid on the 15th. It is understood that the main reason for the failure of the deal was the fact that the promoters added a considerable amount to the purchase price, not being satisfied with the 10% commission allowed by the company. Dalton & Lark continued quiet. The July dividend of 1/2 c. per share was paid on the 15th. Buyers were not numerous. Daly was slightly lower in the offerings, without any improvement in the bidding. The properties are making a good record, but the absence of dividends, which should be paid, continues to depress the stock. Daly-West was in good demand at the previous week's quotations. The improvements at the main shaft are being pushed with vigor.

Neither Four Aces nor Eagle did any business worthy of note. The quotations remained practically unchanged. East Golden Gate displayed no activity, although work with the diamond drill is reported to have commenced. This drill is being used for the purpose of prospecting from the foot of the shaft. Galena is making regular shipments and the properties continue to look well. The stock did some business at quotations of the previous week. Horn Silver continued active, although sellers were not willing to make any further concessions. At the delinquent sale of Lucky Bill it developed that practically all of the stockholders had paid the last assessment. Work is being pushed at the properties. Development work on the Little Pittsburg continued.

On the 20th the Mercur Company will pay its July dividend of 12 1/2 c. per share. These stocks were in fairly good demand during the week, and did most of the business, although the quotations remained about as during the previous week. The Mammoth is reported to be looking extremely well. The Mercur mill closed down for nearly two days on account of flood waters washing into the engine room, but full operations have now been resumed. The damage done by the flood was merely nominal. The properties, especially the Mattie, never looked as well as at present. Ontario continued quiet, with quotations practically unchanged. Overland is looking well. Buyers and sellers of Silver King did not get together to any marked degree, the sellers being unwilling to make

concessions. The work of increasing the mill plant of the Sunshine Company is to be vigorously pushed. The stock was offered only in limited amount. Swansea showed no improvement in price over the previous week, but on the contrary sold slightly off, although the close was somewhat stronger.

An encouraging change has just occurred in the formation at the Tetroz. It now looks as though pay ore was not far away. Utah continued making a gratifying record of production.

San Francisco. July 18. (From Our Special Correspondent.)

The market for the Comstocks has dragged along through the week with small transactions, low prices and a general lack of interest. An attempt was made to-day to close the week with some appearance of strength and activity, but it was not very successful.

Some closing quotations are: Chollar, \$2.50; Consolidated California & Virginia, \$1.75; Hale & Norcross, \$1.40; Potosi, \$1.20; Confidence, \$1.10; Ophir, \$1.05; Gould & Curry, 84c.; Sierra Nevada, 59c.; Crown Point, 45c@47c.

There has been quite a little spurt in the Bodies under the influence of reports of an important strike in the Bulwer. Bodie Consolidated was sold to-day up to 58c.; Bulwer, 45c., and Mono, 25c.

On the Gold Mining Exchange business has been very quiet also and sales smaller than for some weeks. No new stocks have yet been brought out on the board. Closing prices are: Sebastopol, 50@51c.; Savannah, 47@50c.; Lockwood, 29@30c.; Grant, 21@22c.

The monthly bullion statement of the Chollar for the month of June is as follows: Worked at Nevada mill 530 tons of ore; gross proceeds in bullion, \$10,300; cost of reducing, \$3,445; net proceeds in bullion, \$6,921; assay value per ton, \$25.31; gross average per ton, \$19.56; net average per ton, \$13.06. Mill worked 77 2/3%.

At the annual meeting of the Savage Mining Company the old Board was re-elected, with George R. Wells as president, E. B. Holmes as secretary and R. P. Keating as superintendent. Mr. Holmes reported a cash balance of \$12,084 on July 15th. Mr. Keating's report showed that during the year there had been taken from the mine 3,098 tons of ore, of which 1,000 tons were milled at the Mexican mill and 2,078 tons at the Nevada mill. The bullion yield of this ore was as follows: Gold, \$19,054; silver, \$46,053; total, \$65,107; discount, \$22,961; net cash received, \$42,146.

BY TELEGRAPH.

San Francisco, Cal., July 24.—The opening quotations to-day were as follows: Best & Belcher, 53c.; Bodie, 49c.; Bulwer, 25c.; Chollar, \$1.75; Consolidated California & Virginia, \$1.65; Crown Point, 38c.; Eureka, 25c.; Gould & Curry, 64c.; Hale & Norcross, \$1.10; Mexican, 53@54c.; Mono, 20c.; Occidental, 66c.; Ophir, 94c.; Potosi, 94c.; Savage, 63c.; Sierra Nevada, 52@55c.; Union Consolidated, 42@44c.; Yellow Jacket, 40c.

British Columbia. July 17. (From Our Special Correspondent.)

Though there has not been any general revival of stock selling, yet a few heavy transactions have taken place in this camp since the last report was made. Messrs. A. B. Mackenzie & Co. sold 13,333 shares of Le Roi at \$5 per share. This stock was formerly owned by H. G. Stimmel, of Spokane. Messrs. Mackenzie & Co. purchased for J. B. McLaren, of Ottawa. The facts connected with this purchase were reported to me by Mr. Mackenzie's partner, and I have since learned, though not from the same source, that Mr. McLaren has purchased 50,000 shares of Jumbo stock at \$1 per share.

From an authentic source I have been informed that while there are a number of investors in the camp there is a decided disposition to wait until there is a greater output from the various shipping mines than has appeared up to the present time. I have not the figures at hand to make a comparison with last year, but it is quite evident that production here and shipment are two different things and that it will be September before the greatest activity in the shipment of ore is reached. The present output of the various shipping mines will hardly reach 250 tons per day, and yet I understand the Trail Creek smelter management intends to increase its capacity to a daily output of 600 tons. Of course these figures can be easily reached when such mines as the Jumbo, Columbia and Kootenay and two or three other prolific producers of the camp contribute their quota.

The summer, like the winter, has its drawbacks in this camp. Forest fires are very prevalent all over the Kootenay country and the condition of the Columbia River for the past fortnight has been such as to materially interfere with traffic. The population of Rossland continues to increase in about the same ratio as heretofore. There has been no cessation of the activity hitherto noted in connection with the development and assessment work of the camp. Along the line of the Spokane and Red Mountain Railway the work of grading has commenced and the general activity of the camp has increased since the date of my last report, though the prevailing forest fires are doing much damage and are greatly interfering with travel and traffic.

London. July 16. (From Our Special Correspondent.)

The mining stock market has been dull in all sections during the whole week. Besides the past

week has been the end of a long account, and that has been another cause for a temporary suspension of business. The chief interest in the market has been centered in the issue of new debentures by the British South Africa Company. At first the market strengthened after the issue was announced, but afterward the general opinion was considerably altered. As I mentioned last week, there is much doubt as to whether the interest can be paid or not, and as to what will happen if the interest is not paid. These questions have evidently come home to the shareholders in the company, and after they were thought over for a few days, some very unpleasant conclusions have been arrived at. Hence many recriminations have been rife, and the directors of the Chartered Company have been much blamed for taking the course of issuing debentures privately and without consulting shareholders. If the shareholders had been homogeneous, and if there had been no fictitious buying and selling on the stock exchange, the best course would have been to take the shareholders into confidence and to issue new shares, giving the first offer to present shareholders. It is an open question whether under present circumstances such a course would have been advisable. The directors evidently thought not, but many prominent shareholders think otherwise. The result is that Chartered are falling off, and are with difficulty sustained at £3, while the quotation of debentures is not quite as high as the allottees of the issue would desire.

The South African market has not been very active. The output of the Witwatersrand for June was a trifle under that of May, being 193,640 oz., or about 1,000 oz. less than May. Judging by individual returns it would appear that some of the smaller mines have not sent in returns at all, and that other smaller ones have been handicapped by shortness of labor. Robinson has eclipsed all former records; its returns being over 20,000 oz., while Ferreira has increased its output to 13,418 oz. In spite of these and other notable increases the market for gold shares has been dull.

The West Australian market has not shown much life, though the return of Mainland Consols for its first month's crushing with 10 stamps of 1.276 oz. from 27 1/2 tons, was worked for all it was worth. A strong suspicion has lately been percolating into the public mind, that the returns of West Australian mines are cooked by hand picking of the ore before it goes to the mill. In many cases the gold-bearing veins are not more than a foot wide.

Other sections of the mining market have also been dull. Very little has been done in New Zealand, and Indians have been rather off color by reason of the prevalence of cholera in the Mysore district. Americans and British Columbians have not exhibited any feature of interest during the week.

Paris. July 13. (From Our Special Correspondent.)

The stock market has been quite uneventful for the past two weeks. The metallurgical stocks have continued high, with only a slight inevitable reaction, which did not seriously interrupt their progress. The copper stocks continue to attract much attention and generally to hold their high prices. The lead and zinc shares have been active also and have generally risen in price.

The market for the African gold shares continues dull and quiet. No one is disposed to buy just now; the holders of the dividend-paying stocks do not want to part with them, and those who have the more speculative stocks, while they would like to part with them, cannot do so now except at a loss.

L'Economiste Francais of yesterday has an article on the mineral production of the United States, based on the admirable statistics published in the Engineering and Mining Journal. It is a most appreciative paper, and is signed by M. Pierre Leroy-Beaulieu, who has traveled much in your country and understands its conditions.

I have just been examining a very curious monograph contained in the volume published by the Faculty of Law of the University of Lausanne on the occasion of the Swiss Exposition of 1896. The author of this monograph is Prof. Vilfredo Pareto, and its title is "The Curve of the Distribution of Wealth." M. Pareto, who is at once mathematician and jurist, has taken the statistics of Great Britain, France, Prussia, Switzerland and half a dozen other European countries, and using different rates of income and the number reported at each rate as ordinates and abscissæ, he has constructed for each his curve expressing the distribution of wealth. He finds that this curve is simple in form, and can easily be expressed in an equation. The remarkable point is that all the curves have a close resemblance, one might call them, indeed, almost identical. It is a pity that he could not have added the United States to his list. Though I am not so profound a mathematician as M. Pareto, his demonstrations seem to me unassailable, except in the one point that he does not allow for the cases in which x = 0—that is, of those who have no income at all. But it may be that this possession of nothing is inconceivable by the mathematical mind, just as it would be impossible for a military man to plan a campaign without reference to supplies.

But to what a condition has this lawyer-mathematician reduced us! Our economists have been for years arguing on the varying influences of national character, of laws, of material resources, of industrial conditions; and here comes this demonstrator with his curves and his equations and shows that all our discussions go for nothing; if we take

relative wealth as expressed in the final result of the yearly return enjoyed, it is a simple case of x = a + n — in which the unknown quantity is easily ascertainable.

Perhaps these philosophers are right; and there is certainly a curious similarity in men and their actions if we take the average and not the unit. For myself, I prefer to remain an individual and not an expression to be differentiated by the calculus—and to treat other men in the same way.

We find it rather difficult here to understand the declaration of your Democratic Convention in favor of the silver standard, for that is what it practically amounts to. It is perhaps well that the issue between the two parties should be defined. At this distance it is not easy to tell with which the chances of success are; but we hope that your troubles will be settled soon. AZOTE.

MEETINGS.

Cambria Coal and Iron Company, at the Waldorf Hotel, New York City, August 11th, at 12 o'clock, noon.

Iowa Gold Mining and Milling Company, at the office of the company, 301 People's Bank Building, Denver, Colo., August 11th, at 10 a. m.

ASSESSMENTS.

Table with columns: Name of Co., Loc'n., No., Dinq., Sale, Amt. Rows include Bay State, Belle Isle, West & Belcher, Bullion, Channel Bend, Chollar, Eureka Con., Korus, Gold Belt, Granite Hill, Hale & Norcross, Hartey Con., Kentuck Con., Leo, Mabelle, Marguerite, Nimshew, North Belle Isle, Pine Hill G. & S., Utah State Gold.

DIVIDENDS.

Table with columns: NAME OF COMPANY, Current Dividends (Date, Amount), Paid since Jan. 1, 1896, Total to date. Rows include Atna Con., Alaska-Mexican, Alaska-Treadwell, Anaconda, Aurora Iron, Bangkol-Cora Bell, Big Six, Boston & Mont., Bullion Beck & Ch., Calumet & Hecla, Cariboo, Centennial-Eureka, C. O. D., Dalton & Lark, Dominion Coal, Elkton Con., Florence, Galena, Gold Coin, Golden Fleece, Gold & Globe Hill, Hecla Con., Highland, Homestake, Hope, Horn Silver, Iowa, Iron Mountain, Isabella, Le Roi, Jackson, Mammoth, Mercur, Minnesota Iron, Mont. Ore Pur. Co., Moon-Anchor, Moose, Napa Con., Ontario, Osceola Con., Ottaqueachy, Portland, Quincy, Silver King, Slovan Star, Small Hopes, Smuggler-Union, Union, Utah, Victor, Victor M. & L., War Eagle.

Totals: \$2,080,750; \$8,468,340; \$11,775,111. * June dividend paid. † Extra dividend. ‡ Extra dividend of \$2 included.

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

STOCK QUOTATIONS.

BOSTON, MASS.*

Table with columns: NAME OF COMPANY, Location, Par val., July 17, July 18, July 20, July 21, July 22, July 23, Sales.

* Official quotations Boston Stock Exchange. Total sales, 49,411.

INDUSTRIAL COAL AND COAL RAILROAD.*

Table with columns: NAME OF COMPANY, Par value, July 18, July 21, July 22, July 23, July 24, Sales.

* Official quotations N. Y. Stock Exchange. Total shares sold, 151,184.

NEW YORK.*

Table with columns: NAME OF COMPANY, Location, Par val., July 18, July 20, July 21, July 22, July 23, July 24, Sales.

* Official quotations N. Y. Stock and Com. Stock & Petroleum Exchanges. Total shares sold, 8,550.

COLORADO SPRINGS, COLO.*

Table with columns: NAME OF COMPANY, Par val., July 13, July 14, July 15, July 16, July 17, July 18, Sales, Sales*.

Total shares sold: Listed, 426,810; Unlisted, 13,100. * Board of Trade Exchange.

ST. LOUIS, MO. Week ending July 21.

Table with columns: NAME OF COMPANY, Company's Office, Par Value, Bid, Asked, Last Dividend.

SAN FRANCISCO, CAL.*

Table with columns: NAME OF COMPANY, Location, Par value, July 18, July 20, July 21, July 22, July 23, July 24.

* Official telegraphic quotations, San Francisco Stock Exchange.

BALTIMORE, MD.* Week ending July 23.

Table with columns: NAME OF COMPANY, Locn, Par value, Bid, Ask, NAME OF COMPANY, Locn, Par value, Bid, Ask.

* Official quotations Baltimore Stock Exchange.

BRITISH COLUMBIA.* Week ending July 17.

Table with columns: NAME OF COMPANY, Par value, Selling price, NAME OF COMPANY, Par value, Selling price.

* From our special correspondent.

LONDON.

July 11

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations (Buyers, Sellers), and various company names like N'th Americans, Alaska-Treadwell, etc.

DENVER, COLO.

Table with columns: NAME OF COMPANY, Par val, July 13, 14, 15, 16, 17, 18, and various company names like I'd Mines, Andonada, Banke, etc.

PARIS. Week ending July 10.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Divs. last year, Prices (Op'ning, Closing), and various company names like Acleries de Creusot, Anzib, Boleo, etc.

MEXICO. Week ending July 16.

Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Prices (Opening, Closing), and various company names like Amistad y Concordia, Guanajuato, etc.

VALPARAISO, CHILE.

July 2.

Table with columns: NAME OF COMPANY, Capital, Share value, Last Dividend, Prices (Bid, Asked, Last sale), and various company names like Arturo Prat, Caracoles, etc.

SHANGHAI, CHINA.

June 12.

Table with columns: NAME OF COMPANY, Country, No. of shares, Par. Paid up, Last dividend, Price, and various company names like Jelebu Mg. & Trnd., Punjom Mg. Co., etc.

SALT LAKE CITY, UTAH. Week ending July 12.

Table with columns: Name of Company, Par value, Bid, Asked, Actual selling price, and various company names like Ajax, Alliance, Annie, etc.

PHILADELPHIA PA.

Table with columns: NAME OF COMPANY, Location, Par Val, Bid, Asked, Selling price, and various company names like Cambria Iron, Choc & Gt. Cifs, etc.

PITTSBURG, PA.

Week ending July 22.

Table with columns: NAME OF COMPANY, Location, Par val, Bid, Ask, Selling price, and various company names like COAL, N.Y. & C. Gas Co., etc.

HELENA, MONT.

Week ending July 18.

Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bid, Asked, Shares sold, Price, and various company names like Am. Dev. & M. Co., Butte, Helena, etc.

* Special Report of J. P. Bissett & Co.

The prices quoted are in Shanghai taels.

* Special Report of Samuel K. Davis. Total shares sold, 18,987

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 \$42,390,000. Note.—Corrections to this table are made monthly. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

POSITIONS VACANT.

FREE ADVERTISING

Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE, whether subscribers or not.

The labor and expense involved in ascertaining what positions are open, in gratuitously advertising them and in attending to the correspondence of applicants, are incurred in the interest and for the exclusive benefit of subscribers to the ENGINEERING AND MINING JOURNAL.

Applicants should inclose the necessary postage to insure the forwarding of their letters.

1463 WANTED - A GENTLEMAN FAMILIAR with railway supplies and specialties, knowing the manufacturers and comparative merits of their products. Address H. G., ENGINEERING AND MINING JOURNAL.

1467 WANTED - ASSAYER AND ASSISTANT Chemist, by a firm of refiners of precious metals. Address, stating age, experience and wages expected, REFINERS, ENGINEERING AND MINING JOURNAL.

1468 WANTED - A MAN WHO IS A THOROUGHLY competent Mechanical Draftsman and Chemist, who is willing to start with low wages, where chances for advancement are good; steady position. Address, stating references, experience and salary expected, XY, ENGINEERING AND MINING JOURNAL.

1469 WANTED - A THOROUGHLY EXPERIENCED furnace man who understands manufacturing Ferro-Manganese and Spiegel. Address, with full particulars, O. R. E., ENGINEERING AND MINING JOURNAL.

1470 WANTED BY AN ENGLISH COMPANY a competent and experienced mine manager, to open up gold mine near Rat Portage, Ontario, Canada, and to erect stamp mill. Must assay and have chemical knowledge. Age not less than 35. References to persons in London, England, desirable. State salary. Address R. E., ENGINEERING AND MINING JOURNAL.

1472 WANTED - A FIRST-CLASS MILLWRIGHT accustomed to quartz mill for mine in Central America. Contract three years. Give terms and references. Address MILLWRIGHT, ENGINEERING AND MINING JOURNAL.

1473 WANTED - A GOOD BLACKSMITH for mining camp in Central America. Must understand mule shoeing. Contract three years. State terms and references. Address BLACKSMITH, ENGINEERING AND MINING JOURNAL.

1474 WANTED - ANALYTICAL CHEMIST, for position at a blast furnace. Young man with a few years' experience preferred. Send references and salary expected. Address CARBO, ENGINEERING AND MINING JOURNAL.

1475 WANTED - MINING ACCOUNTANT in California, age about 30, unmarried and Scotch preferred. Undeniable references as to personal character and practical experience. Able to arrange and control the accounts, returns and general commercial business of a large concern. Good salary to a first-class man. Address CALIFORNIA, ENGINEERING AND MINING JOURNAL.

1476 WANTED - A FIRST-CLASS ASSAYER and engineer in the operating of a large deposit of manganese of the kind known as "wad" or "bog." Address with full particulars, references, etc. PRINCIPAL, ENGINEERING AND MINING JOURNAL.

1477 WANTED - A PRACTICAL MINING engineer and metallurgist to take charge of a gold mine and mill in one of the Northern States. Send references and name salary wanted. Address M. & R. Co., ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

Advertisements for SITUATIONS WANTED will be charged only 10 cents a line.

YOUNG MAN, THIRTY YEARS OF AGE, desires position as foreman or assistant superintendent of copper or lead silver smelter. Has practical knowledge of reverberatory and blast furnace work; practical builder of both furnaces. Address COPPER, ENGINEERING AND MINING JOURNAL. No. 17,463, Aug. 22.

WANTED - A FIRST-CLASS ASSAYER for custom sampling works in the Northwest; experience and credentials of the best class indispensable; acquaintance with the business of custom sampling would be an advantage. Reply, stating record, references and salary, to NORTHWEST, ENGINEERING AND MINING JOURNAL.

YOUNG AMERICAN, ENGINEER, TECHNICAL graduate, with long experience as assistant manager with large concerns, having office in downtown New York, would like to act as representative of manufacturing concern, mechanical line preferred. Address J. X., ENGINEERING AND MINING JOURNAL. No. 17,470, Aug. 8.

WANTED - POSITION AS SUPERINTENDENT to sink shafts, drive tunnels, open up mines, etc. Fifteen (15) years' experience with largest companies in America. Can give best of references. Address H. J. S., ENGINEERING AND MINING JOURNAL. No. 17,472, Aug. 22.

MILLMAN DESIRES CHANGE. - THOROUGH experience in milling, concentration and chlorination. Considerable knowledge of cyanide process. Now in charge of successful reduction plant. Address MILLMAN, ENGINEERING AND MINING JOURNAL. No. 17,458, August 8.

WANTED - POSITION AS RESIDENT manager or superintendent; 15 years' practical experience; now with the largest company in Northern Mexico as mine superintendent; Spanish American country preferred; highest recommendations. Address AMERICANO, ENGINEERING AND MINING JOURNAL. No. 17,452, Aug. 1.

MINING ENGINEER AND METALLURGIST of high standing is open to engagement. Large properties or works preferred. Specialties made of successfully treating low-grade ores. Address CONCENTRATOR, ENGINEERING AND MINING JOURNAL.

GRADUATE, C. E., '95, WANTS POSITION during August and September on geological reconnaissance, exploration and mapping of undeveloped mineral property. Experience in geology and surveying. Address GEOLOGIST, ENGINEERING AND MINING JOURNAL. No. 17,461, Aug. 1.

HYDRAULIC AND MECHANICAL ENGINEER, 18 years' experience in designing and erecting hydraulic-power plants, including dams, canals, buildings and machinery, is open to engagement. Best references. Address M. R. B., ENGINEERING AND MINING JOURNAL. No. 17,464, Aug. 1.

WANTED - POSITION WITH COMPANY intending to adopt the cyanide process. Large experience; good references. Address CYANIDE, ENGINEERING AND MINING JOURNAL. No. 17,465, Aug. 15.

A CIVIL ENGINEER WANTS TO REPRESENT manufacturers of mining and other machinery and supplies in the south and west part of the United States. Address J. C. E., ENGINEERING AND MINING JOURNAL. No. 17,466, Aug. 29.

CHEMIST AND ASSAYER, SIX YEARS in responsible positions, now in charge of a Lake Superior laboratory, desires position in Southwest. Refers to present employers. Address "V.", Box 399 Ironwood, Mich. No. 17,468, Aug. 29.

MECHANICAL ENGINEER AND METALLURGIST would like a change after July 31; has charge of furnace and concentrating works. Address F. H. A., care W. Hoegner, Indiana Hotel, Cincinnati, Ohio. No. 17,469, Aug. 22.

YOUNG MAN, GRADUATE LEHIGH UNIVERSITY School of Mines, desires a position as chemist, assayer or assistant to the superintendent. Good references; willing to go anywhere. Address L. U., ENGINEERING AND MINING JOURNAL. No. 17,471, Aug. 1.

A POSITION WANTED IN SPANISH SOUTH America as chief accountant or representative of a mining or manufacturing concern. Experience for a number of years with one of the largest mining enterprises in Mexico; full knowledge of English, Spanish and German; also some French; 30-31 years; single; best references. Address SPANISH SOUTH AMERICA, ENGINEERING AND MINING JOURNAL. No. 17,461, Aug. 22.

Contracts Open.

TREASURY DEPARTMENT, OFFICE SUPERVISING ARCHITECT, Washington, D. C., July 28th, 1896. - Sealed proposals will be received at this office until 2 o'clock p. m., on the 28th day of August, 1896, and opened immediately thereafter, for all the labor and materials required for the erection and completion (except heating apparatus) of the U. S. Post Office Building at Beaver Falls, Pa., in accordance with the drawings and specifications, copies of which may be had at this office or at the office of the Superintendent of Construction at Beaver Falls, Pa. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any and all bids and to waive any defect or informality in any bid if it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for Erection and Completion (except heating apparatus) of the U. S. Post Office, Beaver Falls, Pa.," and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

TREASURY DEPARTMENT. - Office Supervising Architect, Washington, D. C., July 17th, 1896. - Sealed proposals will be received at this office until 2 o'clock p. m., on the 14th day of August, 1896, and opened immediately thereafter, for all the labor and materials required for the erection and completion (except heating apparatus) of the U. S. Post Office Building at South Bend, Ind., in accordance with the drawings and specifications, copies of which may be had at this office or at the office of the Superintendent at South Bend, Ind. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for the erection and completion (except heating apparatus) of the U. S. Post Office Building at South Bend Ind.," and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

PLANS FOR BRIDGE. - Bridge Engineers are requested to submit designs for the superstructures of a new bridge over Newtown Creek, between Manhattan avenue, in the City of Brooklyn, and Vernon avenue, in Long Island City, to the Joint Bridge Committee of the Board of Aldermen of the City of Brooklyn and the Board of Supervisors of Queens County, at a meeting to be held at Common Council Chambers, City Hall, Brooklyn, on the 23rd day of July, 1896. These designs are to be for the superstructures of a bridge to replace the present Vernon avenue bridge. The style and dimensions of the new structure, the method of moving the same and the clear waterway are to be determined by each designer, and are to be in accordance with the regulations of the United States War Department. Each competitor is to submit drawings showing the general design of the proposed structure, with length of movable span or spans, and of stationaries, if any, width of clear waterway, and of roadway and footways, loads proposed to be sustained and carried, dimensions of all the parts and modes of construction, and strain sheets showing the forms and construction of typical members with strains sustained; also the metals proposed to be used, style of flooring and motive power, with sufficient detail to indicate the manner of the application and operation of the same, and a typewritten description of the proposed structures. The length between the bulkhead lines measured on a line from the intersection of the center of Manhattan avenue and the bulkhead to the intersection of the center of Vernon avenue and the bulkhead is 280 ft. The angle of intersection of this line with the bulkhead lines taken down stream, on the Queens County side, measured from south to west, is 74 degrees 30 minutes. The width of Manhattan avenue is 70 ft., and of Vernon avenue is 80 ft. The grade of the avenue at the bulkhead line is 17 ft. above high water. The committee will make no compensation to any engineer competing excepting to the one whose designs are accepted and approved. Each engineer will be requested to submit in writing with his designs the price of the same, and by submitting his designs each engineer agrees to make no charge therefor, or for any work done or expense incurred, unless his designs are approved and adopted, and in no event shall such charge or price exceed the price submitted with the design.

Any desired detail or site not herein contained may be had upon application to JOHN J. McLAUGHLIN, County Engineer of Queens County, N. Y.

WATER-WORKS. - The President and Board of Trustees of the village of Cerro Gordo, Platt County, Illinois, will receive sealed bids for a complete system of water-works until July 23d, 1896. The works will consist of a brick pumping station, brick tower and tank, one gasoline engine and a vertical power pump, and a system of water main pipes, hydrants and valves. The contractor will be paid cash for all of the system except the water main pipes, hydrants and valves, for which he must receive special assessment bonds. Specifications may be obtained of the village clerk or Chas. F. Sturtevant, Consulting Engineer, at whose offices the plans will be on file after July 10th. The Board will receive bids on any division or the entire system; but must be written on the printed forms attached to the specifications. A properly endorsed certified check of \$200 on any division, or \$500 on the entire system, must accompany each proposal. All checks shall be made payable to the order of the "Treasurer of Cerro Gordo, Illinois." Any contractor failing or refusing to enter into a contract, if awarded him, within 10 days of such award, will forfeit his check to the village. A solvent and satisfactory bond of \$1,000 on any division of this work, or \$5,000 on the whole system, will be required.

ENGINEERING AND MINING JOURNAL. ADVERTISING RATES. (NONPAREIL MEASUREMENT.) Table with columns for Line, Inches, Regular Edition, One Month, Three Months, Six Months, Nine Months, Twelve Months. Includes SPECIAL POSITIONS section at the bottom.

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Situated on State Ridge, Harford County, Md. This is a fully-equipped plant between 5 and 6 acres. The quarry is in a paying and working condition and must be sold to settle an estate; will be sold at a BARGAIN. Reference, J. A. BARNETT, Delta, York Co., Pa. For full information address G. A. WOLTMAN, Real Estate and Insurance, York, Pa.

FOR SALE.

MONO MINE, UTAH.

NOTICE OF SALE OF MINING PROPERTY.

Notice is hereby given that the undersigned, Receivers of the Charter Oak Life Insurance Company, acting under authority and in pursuance of an order passed on the 12th day of June, 1896, by the Superior Court of Harford County and State of Connecticut, will, between the hours of 12 o'clock, noon, and 2 o'clock P. M. on Saturday, the 29th day of August, 1896, at the west front entrance to the City and County Building, in the City and County of Salt Lake, in the State of Utah, offer for sale, and sell at public auction, to the person or persons who shall make the highest bid therefor for cash, upon delivery of the deed therefor by said Receivers, within thirty days after said sale, all the right, title and interest vested in, and which they now as Receivers as aforesaid have, of, in and to the following described mining claim and machinery, and tunnel claim and other property connected therewith, situate in Ophir Mining District, Tooele County, State of Utah, described as follows, to wit:

That certain mining claim situate in said district, commonly known as and called the Mono Mine, being more particularly described as follows, to wit: Mineral entry No. 115 in the series of the Land Office at Salt Lake City, Utah, designated by the Surveyor-General as lot No. 46, containing 3.67 acres of land, more or less, and according to the return on file in the General Land Office in said City of Salt Lake, described and correctly described, with magnetic variation at 16° 30' east, as follows, to wit: Beginning at corner No. 1 a post marked No. 1, Lot No. 46, thence south 83° 30' east, 1,600 feet to corner No. 2 a post marked No. 2, Lot No. 46, from which a fir tree 17 inches in diameter marked B. T. bears north 71° 30' west at the distance of 21.5 feet; thence from said corner No. 2 north 6° 30' east, 100 feet to corner No. 3, a post marked No. 3, Lot No. 46, from which a fir tree 17 inches in diameter, marked B. T. bears north 76° west at the distance of 13 feet, and U. S. Mineral Monument No. 6 a fir tree 17 inches in diameter, marked U. S. M. No. 6 on the south side, and U. S. Mineral Monument No. 6 on a board nailed on the east side bears north 59° west at the distance of 462 feet; thence from said corner No. 3 north 83° 30' west 1,400 feet to corner No. 4, a post marked No. 4, Lot No. 46; thence south 6° 30' west 50 feet to a point from which discovery stake bears north 83° 30' west, at a distance of 800 feet, 110 feet to the place of beginning. A description of which is also found recorded in the Recorder's office in said county of Tooele, in Book BB of records on pages 632 to 636, inclusive. Nevertheles, however, reserving and excluding therefrom all that part thereof which is situate east of the center of the ravine crossing said premises nearest the eastern boundary thereof, which ravine is further designated and identified as the one in which a living spring rises a short distance above the north boundary of said premises, together with all and singular the tenements, hereditaments and appurtenances thereunto belonging or in any wise appertaining, including all hoisting works, engines and machinery, tailings and property therein and thereon also in the same district and nearby the same, and once worked in relation to said mine, that certain mining tunnel commonly known and called in that vicinity "The Aetna Tunnel."

Upon such sale being so made and the purchase money paid, said Receivers will convey said property to the purchaser within thirty days after said sale.

Dated this 7th day of July, 1896
ISAAC W. BROOKS & EDMUND A. STEDMAN,
Receivers as aforesaid.
MARSHALL & ROYLE, Salt Lake City, Utah,
Attorneys.
GROSS, HYDE & SHIPMAN, Hartford, Conn.,
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COLORADO SPRINGS, Colo., July 10th, 1896.

DIVIDEND NO. 7.
A dividend of ONE CENT PER SHARE (\$22,500) has been declared, payable July 25th, 1896, to stockholders of record July 15th, 1896.
The stock transfer books will be closed July 18th, 1896, at 3 o'clock p. m., and will be re-opened on the morning of July 26th, 1896.

PERCY HAGERMAN,
Vice-President and Treasurer.

QUINCY MINING COMPANY,

NEW YORK, July 22d, 1896.

DIVIDEND NO. 56.

SIX DOLLARS PER SHARE (4 semi-annual, and \$2 extra) will be payable August 17th next, to registered holders, 25th inst.

Stockholders residing in Massachusetts will be paid at the office of Mr. N. H. Daniels, Transfer Agent, 35 Congress street, Boston.

WM. R. TODD, Treasurer.

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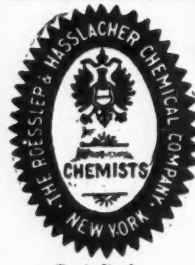
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