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RICHARD P. ROTHWELL, C. E. M.; E., Editor
ROSSITER W. RAYMOND, PH. D., M. E., Special Contributor.
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In our advocacy of the adoption of the metric system, or, perhaps, we should say an unification of all systems of weights and measures, we have repeatedly called attention to the absurdities and inconveniences in our wire gauges, screw thread scales, etc. The chemists have one of equal annoyance in their hydrometers, some using the Beaumé, some the Twaddell and others certain less-known instruments. The thing appears still more absurd when it is reflected that the Beaumé scale differs in different countries. Thus by the American scale specific gravity 1.842 is equivalent to 66.3 degrees B., by the Dutch to 65.8 degrees B. and by Gerlach's to 67.1 degrees B. Such a thing is the more amazing in view of the fact that chemists long ago adopted the metric system for much of their work. The rational hydrometer ought, of course, to show the specific gravity of the liquid by direct reading.

The continued efforts of the strikers in adjoining mines have finally been successful in stopping work almost entirely in the De Armit mines and those of the New York & Cleveland Gas Coal Company, in the Pittsburg District. The suspension of work in that district is now practically complete. Beyond this the coal miners' strike has been without incident during the past week. The West Virginia men still continue at work, and as they do not seem disposed to give up, the chances of success of the movement are gradually decreasing. The supply of coal is still sufficient, and manufacturers are able to keep running without difficulty; there is no reason to suppose that the situation will become at all serious, so long as the shipments from the Kanawha and Pocahontas regions continue as large as they are now. The leaders of the mines have just begun a movement to extend the strike to the Clearfield and other districts supplying the seaboard trade, but their prospects of success are slight. The strike continues singularly free from violence.

It is stated in despatches recently published that some important discoveries of gold-bearing deposits have been made in the Chinese province of Manchuria by experts who were recently employed by the government of China. In reality this is nothing new. It has long been known to the Russian mining engineers that good placer ground was to be found on the tributaries which flow into the Amour from the South, through Manchuria, and some placers have been worked there by Russian miners and prospectors, when they could do so without the interruption of the Chinese authorities. Of course there is no very definite knowledge of the extent of these deposits, but no doubt has existed for a long time that Northern Manchuria was fully as rich as the southern part of the Trans-Baikal in Siberia. Heretofore mining has been strictly prohibited in Manchuria, where, as all over China, it is regarded as impious. The old tradition is slowly breaking down, but still has much influence among these conservative people.

In the new tariff the duty on coal was placed at 67 cents per ton, but anthracite was left nominally on the free list, as in the old law. We say nominally, for a difference was made in the definition of the term anthracite, which is of much importance. To come under that head coal must now contain at least 92 per cent. fixed carbon, the limit having been raised by 7 per cent. This is quite sufficient to shut out the Welsh anthracite, a considerable quantity of which has heretofore been brought to the Pacific coast, the number of ships coming to California ports for wheat cargoes ensuring its carriage at rates very little over the cost of loading and unloading. This coal, under the definition of the new law, is now rated as bituminous, and will have to pay the duty of 67 cents per ton, which will add materially to its price in the California cities, where fuel is already dearer than anywhere else in the United States. No other anthracite coal is imported into the country, and there are, indeed, no sources from which a supply can be drawn outside of the Welsh mines. The new ruling causes some unfavorable comment in California, since it not only increases the price there of the most convenient household fuel, but will also incidentally increase the ocean rates on wheat cargoes, should vessels lose a part of the return freight which has helped to pay their expenses. It will hardly increase the demand there for Eastern anthracite, since vessel rates from Atlantic ports to California are much higher than they are from Liverpool or Cardiff, owing to the lack of return freights.

The recent report of the State Inspector of Mines of Ohio does not give an encouraging view of the condition of the coal miners in that State. During the year 1896, according to Mr. Haseltine's figures, the average price paid for pick mining—that is, in mines where coal-cutting machines are not used—was 36 cents per ton. At this price the miners earned an average of \$1.47 per day, which would not be very low wages with steady employment. But none of the mines were run full time, the average working time reported being 151 days, or less than half time. Under these conditions the average earnings of a pick miner in Ohio in 1896 were only \$221.55 a year, or \$18.46 per month. This is certainly an extremely low price for partially skilled labor and contrasts very strongly with the

rates paid at the Western metal mines. It is not difficult to see why discontent became general.

At the machine mines, which are chiefly in the Hocking Valley—the coal from which has a notable advantage owing to its quality—conditions were not much better. It is true that the average price paid the machine runners amounted to \$3.45 per day, while the helpers who blast and break down the coal after the machine got \$1.80 per day. But the average working time for the year was only 132 days, so that the machine runners earnings amounted only to \$453.40, or \$37.78 per month, while the helpers received \$240.65, or \$20.05 per month. The number of machine-runners is comparatively small, so that the average in machine mines was quite as low as in the pick mines.

Unfortunately these figures are representative for nearly all the Western coal mines, and there is little reason to anticipate any improvement while the present competition for trade continues.

A Good Mining Report.

The De Lamar Mining Company, Limited, of London and Idaho, is one of those concerns which presents to its shareholders an annual report from which proper deductions as to the management and value of their property can be readily drawn. We have just received its report covering the year ending March 31st, 1897, which is in the same form as those of previous years. This gives the regular accounts shown by the company's books and reasons for extraordinary expenditures or reductions of costs. The manager of the mine reports details of milling and mining operations, costs of working per ton, and a statement of the ore reserves, which is illustrated by a plan and section of the mines. In short there is no information which a shareholder might reasonably ask which is not explicitly stated in the directors' report. It is to be regretted that all mining companies are not equally frank.

Much of the data contained in this report is of considerable interest technically. The ore fell off in grade a good deal last year, but more in silver than in gold, so that it is now more decidedly a gold ore than ever. The average assay value in 1896-97 was \$14.07 in gold and \$5.11 in silver, the metals being reckoned respectively at \$20 and 65c. per ounce. Of the total value 71.35 per cent. was saved according to bullion returns. The saving of gold, however, amounted to only a little more than 65 per cent., while that of silver was nearly 87 per cent. The cost of mining and milling, including development work and all expenses, was \$11.14 per ton, against \$11.64 per ton in the previous year. It is useless to compare these figures with those of other mines, since there is no other which operates under conditions at all similar to those at De Lamar; but the working costs are undoubtedly down to a very creditable figure. As to the metallurgy of this ore there is a very instructive article by Mr. D. B. Huntley, the manager of the mines, elsewhere in this number.

A very interesting statement in the De Lamar report is the tabulated results of the six years' working under the present owners. The capital of the company is £400,000, and, if we remember correctly, the price paid for the property was nearly that amount. In these six years the mine has produced ore and bullion worth £1,076,432 at an expense of £542,694; it has now in the treasury £37,178, and has paid in dividends £450,000, or 112.5 per cent. The mine did not by any means do so well last year as it did in previous years, its dividends amounting to only 5 per cent., but it will undoubtedly be a producer for some time yet, and the shareholders may therefore be congratulated upon the success of their investment. The instances where investors have bought mines at high valuations, and have never received their money back, are so numerous that it is satisfactory to find one of which the reverse is true.

The Klondike Placers.

Excitement continues over the Klondike gold discoveries, and it is apparent that a great many people will go to that region in the course of the next few months, though the immediate rush has been checked to some extent by the discouraging reports as to difficulties of transportation, short supplies and the restrictive regulations imposed by the Canadian government. There is a widespread conviction, however, as to the richness of the entire region, and a belief in the possibility of further discoveries of rich placers, some of which may be on the American side of the line. The country will have a considerable number of miners and prospectors added to its population this fall, and it looks as if there would be a much larger accession in the spring. The Alaska lines have put on a number of extra steamers to carry the adventurers who have made up their minds to go into the Yukon region this year and run the risks of the winter. It is quite probable that many of these will not reach their destination this year, but will have to winter at Dyea or some other point near the end of steamship navigation. The long alternative route by way of St. Michael and up the Yukon seems to find but little favor.

No additional news from the new discoveries has been gathered, and none can be received until the arrival of the next steamer which is ex-

pected to bring down more miners and more gold from the Klondike. The actual amount so far brought down has not been ascertained with any certainty. The value of that which has thus far found its way into the United States assay offices is about \$1,200,000, and it is believed that there is still a considerable quantity in the hands of individuals which has not been reported.

There is one point on which probably a number of the Klondike adventurers are deceived, and that is the labor question. Not a few of those who have gone from San Francisco have gone with the belief that if they could not locate claims within a measurable distance of the present find, they could get work at very big wages. They are probably doomed to disappointment. The truth is that there are already many unemployed men in the district, and while living is very costly, wages, with the number that are pouring in, will soon reach the mark which was paid at Circle City before this strike, and competition is bound to reduce this scale lower yet.

Naturally San Francisco and Seattle are making the most of their respective positions as points of departure for the mines, and are diligently cultivating the boom in all possible ways. A correspondent writes that "it is amusing to see what outfits are being offered to the seekers after wealth. One firm advertises, for example, its idea of a year's provisions for a prospector. It includes spices, chow-chow, dried fruits, canned vegetables and goodness only knows what besides. But there are very many who buy such outfits, and their plight when they get into that frozen district may be imagined. The average prospector is content with flour, bacon and coffee with a few beans by way of luxury, but it is no unusual thing nowadays to see a man buying a set of assayer's scales as part of his kit."

The formation of Klondike companions in the East is a flourishing industry, judging from the number of advertisements which appear in the daily newspapers of New York, Chicago and other large cities. Concerning these companies we can only repeat the caution given in our last issue.

Pig Iron Production in 1897.

The figures collected by the American Iron and Steel Association from the blast furnaces show that the production of pig iron in the United States for the half-year ending June 30th reached a total of 4,403,476 long tons, which is a gain of 757,585 tons, or 20.8 per cent., over that of the second half of 1896, but a decrease of 572,760 tons, or 11.5 per cent., from the first half of last year, when the activity of the latter part of 1895 was still felt. In the early part of the present year there was a prospect of another revival of business, and for the first quarter production increased; but expectations were disappointed and furnaces began to drop gradually out of the list again, though the decrease has not been a marked one.

Our own estimate, based upon the reports of the furnaces, has followed the course of production very closely. This estimate, carried on by weeks to July 1st—one day more than the half-year—varied only by 14,500 tons from the exact figures now furnished by the Association.

The time-honored division of the output of pig iron—according to fuel used—has no longer the significance which it formerly possessed. The great bulk of our pig iron is now made with coke; the anthracite furnaces, so-called, have been decreasing in number year by year, and nearly all of them now use a considerable proportion of coke. The charcoal iron now forms only about 3 per cent. of the total, and is made to fill only a special and limited demand. There is no longer any marked distinction between anthracite and coke iron, and the grading of pig is based upon considerations altogether independent of the fuel used in making it.

We have, however, in Mr. Swank's carefully arranged figures the basis for another and more useful classification of the output, and this will be found for three half-years in the table below:

	1896.		1897.	
	First half.	Second half.	First half.	Second half.
Foundry and forge irons.....	1,907,867 38.3	1,591,962 43.6	1,545,295 35.1	1,545,295 35.1
Bessemer pig.....	2,793,672 56.1	1,861,283 51.9	2,435,978 56.7	2,435,978 56.7
Basic pig.....	191,687 3.9	144,716 4.0	281,610 6.4	281,610 6.4
Spiegeleisen and ferro-manganese.....	83,010 1.7	48,930 1.4	80,622 1.8	80,622 1.8
Totals.....	4,976,236 100.0	3,616,891 100.0	4,403,476 100.0	4,403,476 100.0

The most noteworthy point shown by this table, is that the increase during the present year has been wholly in pig iron intended for conversion into steel, the foundry and forge irons showing a slight decrease, as compared with the second half of last year. The increase in Bessemer pig accounted for nearly the whole of the gain, while that in basic pig was very large proportionally, though the total amount of this class of iron is still small compared with Bessemer. The growth of the basic process is shown by the fact that the make of basic pig has been this year nearly 50 per cent. larger than in the first half of 1896, though there was a loss of 20 per cent. in the total output of pig iron. The proportion of iron intended for steel making, which was 61.7 per cent. of the total in the

first half of 1896, fell to 56.4 per cent. in the second half of the year, but in 1897 has risen to 64.9 per cent.

The increase in consumption of pig iron in the first half of the present year was not quite equal to that in production. The difference was about 225,000 tons, or nearly one-third the gain shown, 126,000 tons of this being represented by an increase in unsold stocks, the remainder by iron exported, which is a new feature in the statements. These exports began in the closing months of 1896, and have continued steadily up to the present time. They promise to be a feature in our trade for the future. The exports have been chiefly of foundry iron, though a little basic pig has also been marketed abroad, and some Bessemer pig was recently shipped to Germany as a trial order.

Considering the production by States, we find that in the three half-years under consideration New England, New York and New Jersey taken together showed comparatively slight change. In Pennsylvania and Ohio the output followed very nearly the general course of production, though the recovery this year was a little more marked in Ohio. In the West the greatest fluctuations were shown in Illinois, which is due to the fact that nearly the entire production of that State is controlled by a single company. The quantity of iron made west of the Mississippi has fallen to a very low point, Missouri having reduced its production, while Colorado has for the present dropped out of the list of iron-makers altogether. In the Southern States Alabama's output decreased, but only by a small quantity; Tennessee showed a good increase over both periods in 1896, while in Virginia there was a marked decrease.

Pennsylvania is still far in the lead, furnishing very nearly half the output this year, while Ohio continues second, though with only one-third of the quantity reported for Pennsylvania. The large gain in Illinois this year puts that State third on the list, Alabama dropping to fourth place. Generally speaking, however, the production of the Southern furnaces has been maintained much more steadily than that of the Northern plants, a result due partly to their greater ability to meet a falling market, and partly to their success in making sales of their iron for export.

NEW PUBLICATIONS.

COIL AND CURRENT; OR THE TRIUMPHS OF ELECTRICITY. By Henry Frith and W. Stepany Rawson. London, 1896; Ward Lock & Company. Pages 294; illustrated.

Interesting reading of a strictly non-technical character is furnished in this volume, which is largely historical. Several chapters are devoted to telegraphy in its various forms and applications. In this portion of the work, and in fact throughout, the book is quite distinctly English. The chapters on power transmission and electric traction are not comprehensive. For the reader who desires a superficial knowledge of some of the main branches of electric applications, written up in an interesting way, with numerous anecdotes, this volume will prove entertaining.

T. W. S.

TRANSACTIONS OF THE AMERICAN INSTITUTE OF MINING ENGINEERS. Vol. XXVI. Published by the Institute; R. W. Raymond, Secretary. 1897.

A volume of the *Transactions* of the American Institute of Mining Engineers is generally such a treasure store of professional papers that it is hard to single out any for special mention. The latest volume presents this same difficulty, or merit it might better be called. Perhaps its most striking feature is its catholicity; the wide range of subjects of professional interest which it covers. In this we see the hand of the eminent secretary of the Institute, who has a keen perception of what all branches of the profession are thinking about and a deft manner of drawing out their ideas to enrich the Institute's *Transactions*.

In the twenty-sixth volume we find the subject of ore-dressing treated in the paper "The Cycle of the Plunger Jig," by Prof. R. H. Richards, one of that series of papers by him which will become classic, while E. G. Tuttle contributes two papers on designs of jigs, and Charles W. Goodale describes the "Concentration of Ores in the Butte District, Montana." Both the papers of Professor Richards and Mr. Goodale brought out interesting discussions.

On lead and copper smelting there is the valuable paper "Notes on the Handling of Slags and Mattes at Smelting Works in the Western United States," by William Braden, and the interesting discussion by Mr. L. S. Austin on the design of "A Modern Silver-Lead Smelting Plant," the latter evoking an important critical paper by Mr. H. A. Vezin.

The subject of ore deposits is, as usual in the volumes of the *Transactions*, well treated. The most important paper upon it is probably that on "Vein Walls," by Mr. T. A. Rickard, in which his observations, always keen, in many parts of the world are put upon record. The admirable illustrations accompanying this paper, as well as those in the description of "The Enterprise Mine, Rico, Colo.," also by Mr. Rickard, are worthy of special mention. The other important papers on this subject are: "The Smuggler-Union Mines, Telluride, Colo." (opened on one of the strongest and most interesting veins in the Rocky Mountains), by T. A. Porter; "The Phosphate Deposits of Arkansas," by J. C. Branner, and "Some Mines of Rosita and Silver Cliff," by S. F. Emmons, an abstract of his report to the Geological Survey, in which the famous Bassick and Bull-Domingo mines are described, and the remarkable exploration work that was performed at the Security-Geyser.

On the metallurgy of silver L. D. Godshall writes about loss by volatilization in chloridizing roasting, and F. P. Dewey describes the operation at the Marsac mill of the very successful sulphuric acid process of treating lixiviation sulphides.

On gold most of the papers have to do with the cyanide process, Professor Christy's on "The Solution and Precipitation of the Cyanide of Gold," being of course the most important. A vast amount of experimental work was done before the preparation of this paper, which will be a standard reference on the subject. Mr. Furman's notes on "Laboratory Tests" for the cyanide process are thoroughly practical and up-to-date, while Geo. A. Packard contributes a general review of the cyanide process in the United States. As for the other branches of the metallurgy of gold, the most interesting contribution to this volume is that of Mr. Bayliss on "The Accumulation of Amalgam on Copper Plates," which called forth a very interesting discussion.

Iron and steel, of course, receive due attention. The most important paper in this division is unquestionably "The Microstructure of Steel and Current Theories of Hardening," by Albert Sauveur, who has already achieved much distinction and a European as well as an American reputation in this field. "The Invention of the Bessemer Process" was the subject of the presidential address by the late Joseph D. Weeks, which was a restatement of the parts that Kelly and Mushet took with Bessemer in this invention. Owing to the hostile criticism which this address received, and the untimely death of its author, the secretary of the institute has only included such portions of it as are of historical value, omitting the controversial. The paper by T. D. West, on "Standard Physical Tests for the Product of the Blast Furnace and Their Value" and "The Effect of Shrinkage and Contraction in Iron Castings," are worthy of mention.

We cannot, however, mention one-half of the valuable papers that this volume contains, though we must not omit reference to the description of the Wetherill magnetic separating process, which has already become of great industrial importance, by Messrs. Wilkens and Nitze. If any important subject has been scantily treated in Vol. XXVI., it is coal and the collieries, but in view of the full attention this has received in previous volumes its dismissal in the last may be easily overlooked.

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.

Annual Report of the Secretary for Mines and Water Supply of Victoria, Australia, During the Year 1896. Melbourne, Australia; Government Printer. Pages, 71; with diagrams. Price, in New York, \$1.75.

New South Wales Statistical Register for 1896 and Previous Years. Part I.—Local Government. Part II.—Shipping. T. A. Coghlan, Government Statistician. Pamphlets. Pages, 45 and 38, respectively. Price, in New York, 35c. each.

Annual Report of the Inspectors of Coal Mines of the State of Washington, for the years 1892, 1893, 1894; also 1895 and 1896. J. H. Price, Secretary of State. Olympia, Wash.; State Printer. Two pamphlets. Pages, 70 and 58, respectively.

CORRESPONDENCE.

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

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

Mineral Wealth of Arkansas.

Sir: Your issue of July 24th, page 93, contains a letter upon "Mineral Wealth in Arkansas." Should any of your readers think seriously of looking into the gold, silver, copper, lead, antimony, zinc or manganese mines of the region referred to, I would suggest that they first inform themselves of the reports made upon that country by the Arkansas Geological Survey. The reports on "Novaculite," on "Manganese," and on "Gold and Silver" will be especially useful. Some valuable information upon the gold mines of that district will be found in the *Engineering and Mining Journal* of August 18th and of October 20th, 1888.

The manganese of Polk County is good, what there is of it, and it is doubtless assumed that the construction of a railway through that part of the State puts a new phase on the question. But the mode of occurrence of the ore will not admit of its being worked on any considerable scale. The antimony mines have never paid; whether they will pay with a railway nearer them remains to be seen. Zinc, copper and lead have never been found in the region in any quantity.

JOHN C. BRANNER,
Late State Geologist of Arkansas.

STANFORD UNIVERSITY, California, July 30, 1897.

Kanawha and New River Coals.

Sir: I notice you speak in an editorial in the *Engineering and Mining Journal* of July 24th of the "Kanawha Region, now sending nearly all its output westward." This does not recognize the fact that there are two distinct districts comprised in the region to which you refer. The one, known as the Kanawha District, always sends by far the greater portion of its output westward, either by rail or the toll-free Kanawha River. The other, shipping entirely by rail, supplies mainly the eastern markets, and is the coal which is commonly spoken of in the East as the Chesapeake & Ohio New River steam coal. It is from this district that the large contracts taken by the Chesapeake & Ohio Railway, and referred to in your publication some months ago, are to be filled.

The Kanawha District, which is directly contributory to the Kanawha River, develops what has been designated by some as the Middle coal measures (No. XIII. of the Rogers Brothers). The coals of the New River District are from what are spoken of as the Conglomerate coal measures (No. XII. of the Rogers Brothers). The former are highly bituminous

and mainly non-coking coals, though one or more seams in the district have been successfully worked for that purpose. They furnish splint and block coals, and excel as domestic fuels and gas coals. The latter consist entirely of semi-bituminous coals usually carrying from 70% to 75% of fixed carbon. They are shipped most largely as steam coals, for which purpose they are among the best. The Navy Department order that all new vessels shall make their trial trip with "Pocahontas or New River coal" is an evidence in this respect. While the beds of the New River and Flat Top (Pocahontas) districts have not been correlated the measures have been, and this, together with a marked similarity in chemical and physical properties, gives very strong grounds for believing that the identity of certain of the beds will be established. The beds are rather thinner in the New River District than in the Flat Top, and the coal usually runs a little lower in fixed carbon, sulphur and ash. In the latter particular it is remarkable, some analyses of lump coal showing less than 1%. While, of course, the coal does not run like this it would be possible, by avoiding accidental ash, to make a coke with a minimum amount of this impurity, and it has always seemed strange to me that no special effort has been made to supply those points where the high freight rates would make this a matter of such serious moment. The seams of this district without exception make a superior coke.

The coals of the New River District burn with a moderately short, white flame, and with comparatively little smoke. The Kanawha coals, as would be expected from their larger per cent. of volatile matter, burn with a great deal more smoke. The coke from each district has distinctive characteristics.

The recent shipments from Kanawha run a little less than 1,000,000 long tons a year by river and a little more than 1,000,000 tons by rail. The shipments from New River are something over 2,500,000 long tons, entirely by rail. This will give an idea of the size of the New River District and some of the points in which it differs from the Kanawha District, and it seems a pity that they should be confounded. Yours very truly,

STANTON, Va., July 31, 1897.

CHARLES CATLETT.

GOLD PRODUCTION OF UTAH.

Written for the Engineering and Mining Journal by Our Special Correspondent.

In 1896 Utah's gold yield was the largest known, or 91,908 oz. as given by *The Mineral Industry*. This is an increase of 25,489 oz., or nearly 40%, over 1895. The impression quite generally prevails that the 1897 yield will show almost like augmentation, but this will lead to disappointment. Now that the second half of the year is a month gone, it seems questionable if the 1897 production will reach the figures of last year, and it is worth while to scan the field, pointing out where the falling off has occurred, as well as what may reasonably be counted on for the near future.

Last year Tintic District, or Juab County, led all the counties both in gold and silver, its gold yield being 40,470 oz., while Tooele County, or Camp Floyd District—the Mercur area—came second, with 36,604 oz. Tintic is mainly a lead-silver district, though some of the mineralized zones carry paying gold and copper ores. During the past spring and summer Tintic shipments were light compared to previous months, owing to an advance in freight and treatment, and to the ruling low prices of silver and lead. While there is no indication of ore exhaustion there is a noticeable falling off in gold contents of some products, to such an extent that the yield of Juab County for 1897 will undoubtedly fall below Tooele's yield in 1896.

Speaking generally, 60% of Utah's 1896 gold output was obtained from smelting products and base bullion and 40% from cyaniding mills. Of this latter amount all but 827 oz. came from Camp Floyd, which had an average total cyaniding mill capacity of 360 tons per day—average value of ore being \$5.60 per ton—and produced 36,798 oz. The Mercur mine supplied 25,283 oz., or nearly 70% of Camp Floyd's entire yield. That is, Camp Floyd produced almost 40% and the Mercur mine nearly 27% of all the gold mined in the State during 1896.

At Camp Floyd one 40-ton mill, the Sunshine, has been idle since December, though it is soon to resume; the Mercur plant has just been augmented from 200 to 300 tons; the Geyser-Marion has somewhat increased its cyaniding capacity, but the Marion mill was closed for several weeks; the Sacramento tonnage averaged about as last year, while the Northern Light mill is beginning to make contributions to the gold output, so that it can be said that up to October nearly, the total tonnage will practically equal that of the corresponding months of 1896. The new La Cigale mill, to treat 150 tons a day at the outstart, will begin its first campaign in September, and the Golden Gate 500-ton plant—800 or more tons when fully complete—will not be in operation before the closing days of the year. From this summary of the work in old and new mills it is evident there can be no very large increase in the output of Tooele County for the current year. On the other hand, beginning with January, 1898, there will probably be treated 1,150 tons a day instead of 360 tons, the average for 1896, besides one additional mill and possibly three in process of erection. As there is an ample supply of ore, averaging fully as well as the mineral treated last year, it would seem a conservative prediction that, month by month, Camp Floyd's gold output will be three times as great in 1898 as in 1896.

Salt Lake County stands third in gold yield for 1896, with 8,808 oz., a total which will be somewhat augmented for the current year. Primarily this is due to the Highland Boy 125-ton mill, at Bingham, which will make its first trial run in August. While Bingham's smelting products, carrying some gold, are considerably smaller in tonnage than in 1896, it would not be surprising to find Salt Lake recording a larger percentage of gold increase than any other county.

Park City, in Summit County, is known altogether as a silver-lead district, but gold in paying quantity is showing there in unexpected places. Several of the more distant districts, Gold Mountain, Ohio, Newton, State Line, Beaver Lake, Blue Mountain and others are reporting new gold finds. Many, perhaps most of them, will not add materially to the production this year or next; nevertheless there is reason to believe that the dawn of a remarkable gold era for Utah is not far distant.

COAL MINERS' EARNINGS IN OHIO.

Mr. R. M. Haseltine, Chief Inspector of Mines of Ohio, in his annual report for the year 1896, in reviewing the number of miners and day-labors, and the time that the mines of the State were in operation, etc., says that the summaries of operations show that if from the number of miners employed in the State the number engaged in operating mining machines be deducted, there were in all 17,220 men employed as pick miners, a decrease of 1,425 as compared with the year 1895. Again, it is found that by deducting from the year's total output of the coal the amount produced by mining machines, that 9,544,250 tons were produced by pick mining, a decrease of 1,019,164 tons as compared with the previous year. The average yearly production for each miner was 55½ tons of run-of-mine coal, an individual loss of 12½ tons, as compared with 1895. The mines throughout the State were worked on an average 151 days, from which it will be seen that each miner made an average daily production of 3.67 tons each day that he worked, as against 3.37 tons during the preceding year.

The scale rate for pick mining up to March 1st for screened coal was 55c. per ton, when the price was advanced to 61c., where it remained until about October 1st, when it was reduced to 45c., where it remained until the close of the year. Assuming that the production was fairly uniform throughout the year, it is found that the average price paid for mining was 56c. per ton. A rule in general use in the State assumes that two-sevenths of the State's production is fine coal. Therefore, at 56c. per ton (the average price which prevailed during the year) the daily wages of each miner will be found to average \$1.47 during the time that the mines were in operation, or a total of \$221.55 for the year's work, which would give to each miner an average pay of \$18.46 per month, as compared with \$18.48 during 1895.

In all 3,368,349 tons of coal were mined by machine. By applying the rules and customs in force in the Hocking Valley, where more than 90% of the machine-mined coal originates, it is found that 2,863,097 tons, which equals 85%, came from wide-work, as it is commonly known, and that 15%, or 505,252 tons, came from narrow-work. It has also been found that 579 persons were employed in operating machines, thus making the average yearly production of wide-work coal to each machine-man 4,944.9 tons, and of narrow-work coal 872.6 tons. The average time that the machines worked is given at 132 days, which gives to each miner a daily average production of 37.4 tons from wide-work, which at the rate of 7.4c. per ton, the average price during the year, would equal \$2.77. To this must be added the amount produced from narrow-work, which is found to be 5.06 tons per day. This at 10.4c. per ton will equal 68c. Thus it will be seen that the men who operated mining machines made an average of \$3.45 per day during the time that the mines were in actual operation. It will be further seen that the year's earnings amount to an average of \$453.40, or \$37.78 per month. There were 4,346 men employed in following the machines and blasting down and loading out the coal. Hence, as compensation for loading 2,863,037 tons removed from wide-working at 30c. per ton, there was paid \$858,929, and for shooting and loading 505,252 tons from narrow-work at 37c. there was paid \$186,943, making the total amount paid out for blasting and loading the machine-mined coal \$1,045,872. This was paid to 4,346 miners for 132 days' work. The average wages while the mines were actually working were \$1.80 per day; and for the year's work they received \$240.65, or \$20.05 per month. It will be observed that the machine miners who were engaged in following the machines worked 19 days less than the pick miners and had but \$1.59 per month more. Those who were employed to operate mining machines received more than double the wages paid to the pick miner. It is believed that the difference in the daily earnings between the pick miner and the machine miner is greater than the returns indicate, as there is no doubt that in many instances the pick miners spent much time in making coal ready when the mines were not in operation. There is no doubt that the difference between the runner and the pick miner in day's work done is less than the returns indicate, as the former under-cut a large amount of coal on days when the mines were idle, the relative time of each being not obtainable.

Were it possible to separate the coal mined by the reciprocating machines from that produced by the rotary bar or chain machine, it is thought that the earnings of the machine runners would show a slight increase over the above. The foregoing amounts fairly represent the average earnings in the several subdivisions of mine labor, as shown by the returns for the year that has just closed.

An Artificial Stone to Resist Action of Corrosive Alkalies.—W. Hempel and W. Seziarski, in *Thonwaren Industrie* 11, 148, describe experiments with artificial stones, which, like the steatite of Norway, North America and the Tyrol would resist the action of fused alkalies, alkaline sulphides and hydrochloric acid, which ordinary firebrick will not do. Mixtures of clay 142 parts, and magnesia 100 parts (44.2% SiO₂ in the mixture); clay 300 and magnesia 100 (20.7% MgO); and clay 57.83, dolomite 42.17 (44.3% SiO₂) gave excellent results.

Acetylene Regulations in Switzerland.—The Swiss International Congress for regulating the production and use of acetylene has drawn up the following prescriptions, subject to final revision: Government permission is necessary for erecting and employing plants for making acetylene. The use of liquid acetylene and portable lamps for it is forbidden. Calcium carbide should be stored in separate places, dry and easy to ventilate, into which no light must be taken. Supplies of carbide must not exceed 50 kilos. The pressure in the producing chambers, pipes and receivers must not exceed 6 cm.; and the apparatus must be fitted with pressure gauges, working automatically, for facilitating a check on the pressure. The use of pure copper is forbidden for lighting appliances. The conduct and supervision of the plant is only to be entrusted to persons who can be depended upon, and who are conversant with the properties of the gas and the use of the appliances. Each appliance is to bear a prominent notice that unauthorized persons are forbidden to touch it. Penalties are to be imposed for any contravention of the prescriptions.

THE PELATAN-CLERICI PROCESS AT THE DE LAMAR MILL, IDAHO.

Written for the Engineering and Mining Journal by D. B. Huntley.

To correct wrong impressions, and to answer fully such questions as mining men are constantly asking concerning this process, is the purpose of my paper. Heretofore, while it was in the experimental stage, I have avoided writing of it for publication, not caring to risk calling the attention of metallurgists to another new process—and possibly its failure. But work with it has now advanced so far, and the results have been such as to justify a full description.

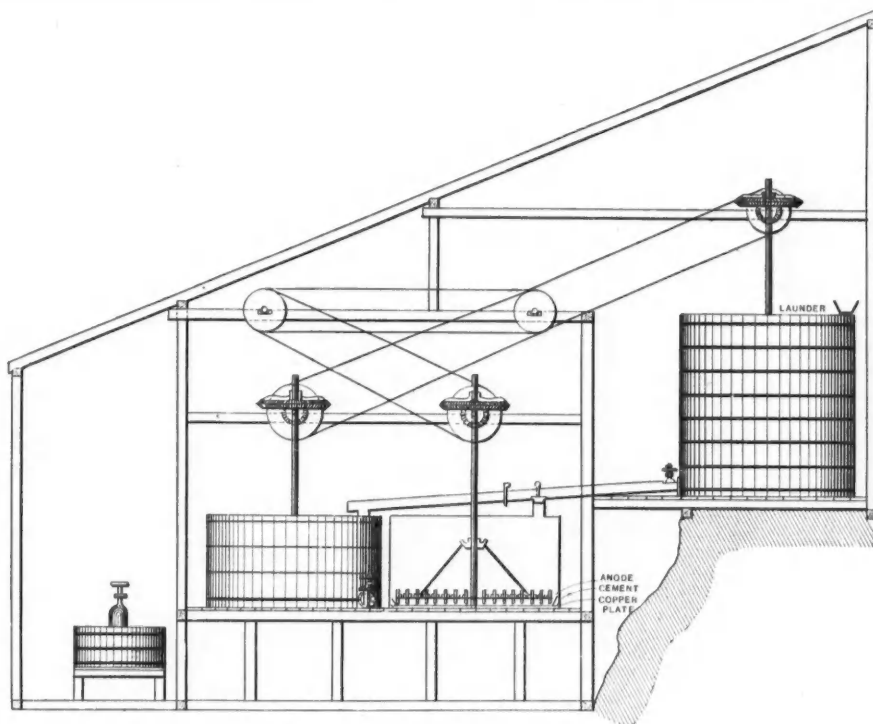
The ore of these mines is an oxidized quartz and quartz porphyry containing 15 to 20% of clay. It is comparatively soft and fine when it reaches the mill, not over 10% requiring crushing with a rock-breaker. There are practically no sulphurets in the ore, careful concentration yielding only about 0.25 to 0.50 of concentrates, which are partly oxidized sulphides of iron, copper, lead and zinc. The valuable mineral seems to be a partly oxidized, gold-bearing iron-silver sulphide. It will amalgamate raw to about 40 to 50%. The addition of salt and bluestone in pans increases the percentage saved. With the high grade ore (\$30) of the earlier days of the mine, about 80% or over was secured, but, with the present ore (\$15, or less), only about 70% of both the gold and silver is saved. The ordinary pan amalgamation process was adopted years ago, and has been steadily in operation since. From two-thirds to four-fifths of the ore values are gold, the remainder being silver. The precious metals in our ores are in very fine particles.

While seeking for a cheaper process than pan amalgamation to work

that there was not grade enough for it to run freely; five circular wooden agitator vats, 8 ft. deep and 8½ ft. diameter; 10 circular wooden agitator-precipitating vats, 4 ft. deep and 8 ft. 8 in. diameter; one ordinary mill clean-up pan; one 10-volt dynamo; one excitor dynamo, an extra of each of these dynamos being kept in place to change upon in case of emergency, which in hot weather seems frequently necessary; one 15-H. P. engine to run the dynamos; one main horizontal shaft and pulleys and belts; one short vertical shaft and one counter-shaft, each with spur gear for each of the agitators and precipitating vats.

The main mill engine furnishes all the power, excepting that for the dynamos. The total is estimated at 60 to 70 H. P. The rock-breaker and retort used are those in the main mill. The construction of the agitator precipitating vat is as follows: It is a round wooden vat 8 ft. 8 in. in diameter and 4 ft. high, having a copper plate covering the entire bottom and cement on the edge to prevent leakage of quicksilver or pulp under it. Motion is given to the pulp in the agitator by a hanging vertical shaft driven by spur gear. The shaft terminates in a frame—four arms and wooden pegs—like any old-style agitator. On the low part of each arm is a sheet of wrought iron, ½ in. thick, 14 in. wide and 4 ft. long, forming the anode plates, from which the electric current passes through the liquid to the quicksilver beneath. Each vat is charged with about 600 lbs. of quicksilver, enough to cover the bottom ¼-in. deep. There is a 2-in. opening in the copper plate to a 2-in. pipe with an iron valve, the hole being stopped with a rubber plug during operations. At clean-up time this is removed and the valve opened.

The operation of the process is as follows: The ore is crushed, using as little water as possible; about one of ore to one of water (which we



ARRANGEMENT OF PELATAN-CLERICI PLANT AT DE LAMAR, IDAHO.

their large bodies of low-grade ore, the attention of the directors of this company was called to the Pelatan-Clerici process in the summer of 1895. A large number of experiments were made at Denver on this ore, and a 50-ton plant was erected at De Lamar in the winter of 1895-96. A portion of the plant—a brick tank—was a failure in its mechanical operation. The home office of the Pelatan-Clerici Company was in London; the drawing of new plans and the making of entirely new machinery took considerable time; Capt. Plummer, the former manager of the mine, was quite unwell, and died in August, 1896; a strike of the miners occurred, and another one was threatened; all these causes delaying the work. A 10-ton experimental plant was finally completed in the fall of 1896, and working tests made on lots of 5 to 100 tons each—469 tons in all—in October, November and December, 1896. These tests gave varying results, but in general gave a yield in bullion of 78 to 83%. The many delays above referred to postponed the completion of the new 50-ton plant to June, 1897.

The entire plant was put in operation between June 6th and 10th. It has run steadily since, barring minor stoppages of the engine for repairs. On July 1st a clean-up was made showing a yield in bullion of 70.1%. There were worked in pulp 871.3 tons of dry ore of an average value of \$12.15 in gold and \$3.02 in silver; total \$15.17 per ton. The average tailings assay was \$2.33 in gold and 62c. in silver; total \$2.94 or an extraction as shown by assay of 80.62%. The screen used was 30-mesh on the Huntington mill and 24-mesh on the 10-stamp mill. Considering this as the first clean-up of new vats in which some of the precious metals in solution have doubtless been absorbed by the wooden vat staves, or plated on the copper bottoms of the vats, the result is quite satisfactory.

The machinery used for the 50-ton Pelatan-Clerici plant consists of 10 stamps; one 5-ft. Huntington mill and self-feeder; one flat chain conveyor belt, used because the pulp is thick and the mill was built so high

call 100% water) is suitable for De Lamar ore, and this makes a thick batter. This runs, and is scraped by a chain conveyor along a trough, and is emptied into one of the agitator vats. It is kept in slow motion to prevent settling by an ordinary agitator shaft and four arms (suspended from above, but not piercing the tank from below) until the agitator is filled to a mark previously established as giving the proper amount for a charge. Then the flowing pulp is turned into another agitator. When a precipitating vat is ready, it is charged by opening a 4-in. valve, allowing the agitator charge, before mentioned, to flow through a trough to the precipitating vat. It is filled in a few minutes, and the chemicals are put in. For De Lamar ore they consist of 2½ to 3 lbs. of KCy and 6 lbs. of salt per ton. The charge is kept in this vat in motion about 20 revolutions per minute, for 11½ hours. A charge is counted as 2½ tons, making the capacity of one vat 5 tons per 24 hours. The electric current is turned on by a switch, passes down the agitator shaft of the vat to the anode plate and through the liquid for a few inches to the quicksilver beneath, decomposing the solution of cyanide and precipitating the gold and silver on the quicksilver, where it is immediately amalgamated. At the end of the 11½ hours a 4-in. gate valve in the side of the vat, a few inches above the bottom, is opened, and the pulp (then tailings) flows out. No extra water is used to wash out the remainder, but the discharge valve is closed, and the vat is ready for a new charge. This is repeated with all the other vats. The plant requires two men per shift. This includes the engineer, but not the battery and Huntington mill man.

We have found it best to clean up twice per month, to prevent the mercury becoming too rich, which seems to make higher tailings. In cleaning-up two extra men are needed. After a charge is discharged, clear water is turned into the precipitating vat, the valve kept open, and the residue washed out—excepting a few buckets of sand which will hang. Then the agitator shaft is stopped by running the belt u o

loose pulley, the iron valve below the bottom opened, men get into the vat with brooms and sweep the sand, water, quicksilver and thin amalgam to the discharge hole. It runs down an inclined trough into the clean-up pan. Usually around the outer part of the pan bottom about a kettle full of fairly hard amalgam is found similar to that which is scraped from parts of an amalgamating pan. From the clean-up pan the amalgam and quick are drawn off and strained through conical duck sacks as at any pan-mill. It is retorted and melted as usual, furnishing bullion about 950 fine in gold and silver.

From the preceding it will be seen that the process is a cyanide solvent process, but the method of collecting the gold and silver is by electrical precipitation. It should be mentioned that part of the delay in installing the new process was due to the struggle to fit it to as much as possible of the old mill machinery; and also that this has resulted somewhat to the disadvantage of the Pelatan-Clerici process.

I would call particular attention to the following points which seem essential. If the pulp is not kept thick enough and fine enough, a layer of sand forms on the surface of the quicksilver, which seems to prevent the deposition of the gold and silver. The pulp should be very thick, like batter, about 1 to 1 of ore and water. This can be best secured by a Huntington mill. We find that a 5-ft. Huntington mill will crush about 30 tons of the ore daily through a 30-mesh screen to a consistency of pulp of 100 of ore to 85 of water. A stamp battery, speed 95, and 30-mesh, has difficulty in discharging such thick pulp. We find the limit to be about 100 of ore to 120 of water. Usually pulp from a battery is 100 of ore to 275 of more of water. With our double discharge mortars and 24-mesh screen, our stamps have had, ordinarily, a capacity of 3 1/4 tons daily. But with this thick pulp, the capacity is reduced to about 1 1/2 tons per stamp daily. It is possible that we shall in time add another Huntington mill and discard the stamps. For a region where water is very scarce the new process seems specially adapted. The loss of quicksilver has varied in the different experiments from 1/4 to 1/2 lb. per ton. In the month of June, for 871 3/4 tons crushed and worked in the new vats, the loss was 281 lbs. of quicksilver. In the preliminary experiments, by using 40-mesh screen, the results were the extraction of 84 to 88% of the values. At present, with 30 and 24-mesh the results are about 80%.

In general the Pelatan-Clerici process seems to be cheaper in operating cost per ton, and gives promise of saving a higher percentage—at least on De Lamar ore—than the old pan amalgamation process. It is too early yet to give with accuracy the average cost per ton. Like every installation of a new process, it is not perfect. We are finding minor defects in the construction which can be advantageously changed, but locally we believe that the process has come to stay.

The accompanying drawing is a vertical section, showing approximately the relative location of the different parts of the machinery of the Pelatan-Clerici process at De Lamar.

SOME OF THE MANGANESE DEPOSITS OF THE VALLEY OF VIRGINIA.

Written for the Engineering and Mining Journal by Charles Catlett.

The manganese deposits which lie along the western base of the Blue Ridge in Virginia, and are found at the same horizon more or less from Vermont to Georgia, apparently reach their greatest development in the region under discussion; but the marked success of the single mine Crimora, and the comparative failure of other developments along the same belt may make a description of the ores based upon recent investigations of interest. These ores are found in a well-defined belt a short distance above the Potsdam sandstone, which is so well-developed in the central part of the State to which this description more especially applies. This sandstone aids in forming the most western ridge of the mountain. Its upper bed is at times very hard, being a semi-vitrified quartzite, and its characteristic worm borings are only visible on weathering. It passes all the way from this into partially or entirely decomposed material, forming at times a clean white silicious sand and at others a very fine silicious material with a slight greenish cast, which is called "clay" by the native miners.

The mineral belt containing iron and manganese ores is found a short distance above this quartzite, often indeed in contact with it, and probably 100 ft. would mark the limit of their separation. This has not been generally accepted owing to the existence of concealed folds and displacements in the sandstone which may make the separation appear much greater, and also to the occasional extensive disintegration of the upper layer of the sandstone into the soft silicious material referred to. From the similarity of their occurrence the iron ores and the manganese ores were probably originally formed under identical conditions, and the passage of quite pure iron ore into highly manganeseiferous iron ore or low-grade manganese ore is common. While iron ore low in manganese is often associated with good manganese ore, the actual passage of one into the other has not been observed, and, without there being any known reason for it, the existence at any point of the one apparently implies an absence or marked limitation of the other.

While greatly varying in character and thickness from point to point, iron and manganese ores are found along this belt for a distance of 150 miles or more, and so persistently as to give strong support to a theory of continuity and contemporaneous formation. This is equally true of the manganese, where it predominates, as of the iron ore. At Stanley, a series of borings, some of them over 300 ft. deep, and reaching a point probably 400 ft. below the outcrop and extending over a considerable distance, have all disclosed the bed of manganese-bearing clay a short distance above the Potsdam sandstone. At Elkton, where at present the most continuous operation in Virginia is being carried on by Kendall & Flick, they have followed this bed for three-quarters of a mile or more and to a considerable depth, and while at times it has thinned out to a few inches, the lead of ore has never been lost, and there has been given to the character of their work a permanency which would appear unique to those familiar with manganese mining, as it is ordinarily spoken of. Near 120-Mile Siding borings have shown a similar condition of affairs. At other points persistent float over a long distance, together with the information furnished by extensive mining for iron ore, implies a like formation.

The inference is that throughout this section there is found a short

distance above the Potsdam sandstone one or more bands of clay carrying iron ore, manganese ore and manganeseiferous iron ore, the preponderance of one of these occurring from point to point and often to the exclusion of the others. A discussion of the probable genesis of this ore, whether from decomposition *in situ* of the formation containing it, or by subsequent segregation, or deposition from solution, as is thought by some, would add too much to the length of this description. An ideal section, which is not seldom practically exemplified, would consist of a steeply inclined bed of manganese-bearing clay conforming to the dip and folds of the firmer underlying beds of sandstone. While this is often clearly recognized, it is necessarily subject to many apparent modifications, as the sandstone contains numerous hidden folds and displacements, which can but seldom be detected and defined from a surface examination. Lying as it does at the base of the mountain, and at many points occupying what was originally a line of drainage, the ore outcrop is often deeply covered with drift, while the soft nature of the enclosing clays permits many small slips and displacements near the surface. At other times the breaking up and scattering of this bed may form an amount of float entirely disproportionate to the extent of the original ore and give false ideas as to the location and value of the deposit from which it has been derived.

The ore of these beds is almost entirely psilomelane, though other varieties occur. It is commonly nodular, the spherical forms predominating, and concretionary layers are often conspicuous. The nodules are usually of small size. The ore is commonly dull in fracture, but often dark blue and bright. It passes all the way from a high-grade ore to a highly clayey or silicious material. The presence of visible free silica along this bed is not common, but the ore is sometimes accompanied by small amounts of black flint. Occasionally the nodules are joined together in a larger mass or more or less flat sheet, and at others the clay may form so small a portion of the whole as to permit it to be spoken of as a mass of manganese ore, but as a rule the nodules are well separated from each other. The persistency of this bed in extent has never been fully recognized, and if its character in other respects were as satisfactory it would warrant most favorable consideration. The variation from point to point in chemical composition and in the thickness of the ore-bearing clay is very marked. At Elkton it is said to average 4 ft., while it has at times gotten down to a few inches, and as much as 30 or 40 ft. have been encountered. I am told that at that point the chemical composition has been quite constant.

In analysis the ores of this belt are not usually of high grade, though at some points such has proven to be the case. In general they may be expected to run from 40% to 50% in manganese, from 0.10 to 0.30% in phosphorus and 10% to 20% in silica. Small quantities of copper, nickel and cobalt are common. The following analyses of well-selected samples from small openings on the line of the ore, near Vesuvius, and covering a distance of some miles, will be of interest:

	(1)	(2)	(3)	(4)	(5)
Silica.....	15.000	10.630	12.300	5.270	3.25
Iron.....	2.800	1.450	1.450	11.300	0.97
Phosphorus.....	0.114	0.116	0.125	0.196	0.10
Manganese.....	42.610	47.060	46.590	44.569	47.37

There are two forms of secondary deposits, derived in whole or in part from the above, which are of importance. One of these is simply the natural result of the breaking down and washing of this bed and may result in a concentration of the ore, though at times the opposite is the case. In the latter event, wide distribution of the ore has not uncommonly deceived prospectors or raised unreasonable expectations. Where collection has taken place these deposits may prove of special value, but must possess very great irregularity and give few evidences as to their probable location. Much of the belief in the irregularity of the manganese ores of the region is derived from limited work on such deposits. There is obviously no marked change in composition from the deposits first mentioned, though there is some indication that phosphorus may be reduced in such ores during the process of weathering.

There is also undoubtedly another kind of secondary deposit formed by solution and redeposition. That this is going on now and has gone on in the past is unquestionable, and some, if not the greater part of such ore, must come from the beds referred to—not necessarily from the beds as they now stand, but also as they formerly stood and as they have been worn down by the action of disintegrating forces. We find the ore in the process of forming and we find the water which passes from the manganese beds carrying manganese in solution and redepositing manganese in its course. The springs, which break from the Potsdam, and which are remarkable in their purity, often carry manganese in minute quantities, and may contribute their share to the formation of these secondary deposits.

Such deposits often exhibit a high degree of purity and concentration with the possibility of large quantities and the certainty of great irregularity. Where these are in process of formation they are found along the lines of surface or underground drainage, and give color to a quite common belief that manganese cannot be found except in low moist ground. Deposits of this character may, however, be found almost anywhere, as there are evidently numerous lines of former drainage through which water no longer circulates and of which there may be no visible evidence. As might be anticipated from the mode of formation, the ores of these last deposits differ considerably from the ores of the others, more, of course, in the prevalence of certain forms than in their exclusion from the latter. The existence of soft manganese (pyrolusite) of very pure quality is not unusual, but unfortunately not in very large quantities. Heavy beds of wad carrying disseminated through the mass crystals of pyrolusite and another oxide of the manganese, probably polianite, are common, as well as the occurrence in such material of numerous small quartz crystals. Under the influence of these waters there is a curious metamorphosis of fragments of quartzite into flint with a retention of the original shape; something I have not noticed elsewhere. All the steps of the change are sometimes visible in the same fragment. It must be evident that a mining operation may encounter all three forms, and this often happens, as they may often pass into each other. From the geological conditions the Crimora mine must include all three. At Elkton the original bed alone is worked.

Some of the reasons for the comparative failure and lack of development in this section are not far to seek. They are the same old ones of

lack of money, skill and careful and thorough prospecting. A hole is dug, a carload gotten out, badly prepared and shipped. The shipment runs high in silica or a little high in phosphorus, the returns are not satisfactory, and that enterprise is abandoned without thought that the former may be reduced and the latter may not represent the average of the available material. Again, deceived by an extensive display of scattered material, machinery is put up without further investigation. And so we might go through the list. The conditions are usually specially favorable for drilling by means of augers, either hand or machine, and under proper management it is possible to secure by means of such work reliable information at a moderate cost.

From the character of the float and the openings which I have had occasion to examine from widely separated localities and the analyses I have made I would be led to conclude that this horizon could only be expected to furnish medium-grade ores, but recollecting the shining example of Crimora and the less extensive though apparently permanent success of Elkton, and the absolutely inefficiency and insufficiency of most of the investigating and prospecting work, it does not seem unreasonable to believe that future developments will disclose large and profitable supplies of ore.

UNDERGROUND PHOTOGRAPHY.

Written for the Engineering and Mining Journal by James Underhill.

In the last issue of the *Engineering and Mining Journal* the methods to be pursued in taking photographs underground, with such an outfit as the engineer can conveniently carry, were carefully explained, and some specimens given of ordinary flash-light work. Some additional speci-



TAMPING IN THE MINES.



JUNCTION OF TWO VEINS.

VIEWS TAKEN IN THE PRUSSIAN MINE, COLORADO.

mens are given herewith, all of them having been taken in Clear Creek County mines.

The views shown will illustrate to the engineer the service which a camera can do him and the aid it will furnish in making reports and similar work. The record of the actual condition and appearance of different points in the mine will be a valuable one, and in some cases a single picture may more than repay all the trouble expended in carrying and using a camera for a long period. Photography was found long ago a valuable aid in surface work, such as railroad location, and it has quite as good a field of its own underground.

Standard Systems of Testing Materials.—A meeting of the International Society for the Testing of Technical Materials will be held at Stockholm on August 23d, 24th and 25th next. This meeting has for its object the establishment of uniform methods of testing building and other materials, and is calculated to do a most useful work. English members are nine in number; among these are Professor Kennedy, Mr. J. G. Stead, of Middlesbrough, and Mr. R. A. Hadfield. The United States has 60 members, while Germany contributes no less than 369 members, and Russia 191. The supply from other countries brings up the total membership to over 1,100. The importance of establishing uniform methods of testing materials is considerable, in order that results obtained in any particular case may be readily compared with others. Considerable confusion has existed in the past, the more especially in the matter of the length of the specimen bars used in tension tests. The 2-in. test-bar, at one time in favor, gives results which are in no way directly comparable with those obtained with an 8-in. or 200-mm. test piece. Similarly very considerable differences are found in the crushing strength of stones and cements, according to the material on which the sample is bedded, and to the care taken in insuring a uniform distribution of pressure over the whole effective area. If lead is used for this purpose, it has been conclusively shown that not only is the ultimate strength of the material reduced, but its method of fracture is entirely altered. In other cases the resistance and the way in which a material fails are affected by the rate at which the load is applied. This is particularly marked in the case of cement briquettes. All these considerations show the importance of establishing standard systems of testing.

ABSTRACTS OF OFFICIAL REPORTS.

Wolverine Copper Mining Company, Michigan.

The annual report of this company for the year ending June 30th, 1897, shows a total production of 2,237,698 lbs. of refined copper. The total quantity of rock hoisted during the year was 108,320 tons; transported to mill and stamped, 82,270 tons, the yield of refined copper being 27 2 lbs. per ton stamped. The product was 2,557,445 lbs. of mineral, the yield in refined copper being 87.5% of the mineral.

The balance sheet shows assets as follows: Cash, \$107,992; copper bills and accounts receivable, \$59,206; cash and supplies at mine, \$12,656; total, \$179,854. The liabilities, including agent's drafts and current accounts, were \$22,563, leaving a balance of assets of \$157,291.

Shaft sinking for the year amounted to 595 ft., of which 103 ft. was in shaft No. 2; 97 ft. in No. 3, and 395 ft. in No. 4.

The statement of receipts and expenses, giving the totals and the averages per pound of refined copper, is as follows:

	Amount.	Per lb., cts.
Sales of copper.....	\$249,846	11.16
Interest.....	2,243	0.10
Total receipts.....	\$252,089	11.26
Working expenses at mine.....	\$156,979	7.02
Smelting, freight, commissions, etc.....	27,963	1.25
Construction.....	4,546	0.20
Total expenses.....	\$189,478	8.47
Profit.....	\$62,611	2.79

The profit of \$62,611, added to the surplus of \$94,680 from the previous year, gave a total surplus of \$157,291 at the close of the year.

President Stanton, in his report, says: "Preparations are now making

for treating the rock from No. 4 shaft, now sinking in the southern end of the mine, and the required plant is in course of erection. The machinery will be ready in due season and will be of approved and economical type.

"As it is not practical to obtain sufficient water to supply another head of stamps at the site we now occupy close to the mine, we have been obliged to look elsewhere for additional stamping facilities and have leased a part of the Allouez company's stamp mill, about four miles distant, and have made a contract with the Hancock & Calumet Railroad to make necessary railroad connections and to transport the rock and other materials at reasonable rates. By this course we avoid the expenditure which would be involved in the purchase of a mill site, the construction of a mill, etc. The cost of transporting the rock, probably, will be less than to any other site now obtainable, while the rental will be less than the interest on the cost of a new mill."

De Lamar Mining Company, Limited, Idaho.

The report of this company is for the year ending March 31st, 1897. The report presented to the stockholders in London gives the receipts as follows: Mine receipts, £126,795; London receipts and exchange, £884; total, £127,679. The charges were: Mine expenses, £92,629; charged off stores account, £6,111; London expenses and income tax, £5,428; total, £104,168; leaving a surplus of £23,511. Adding the surplus from previous year, £20,373, the total was £43,884. From this £2,000 were carried to reserve and £40,000 paid in dividends, leaving a balance of £1,884.

The product of the mine was 40,453 tons milling ore, giving an average yield of \$14.07 per ton, and 116 tons of shipping ore, averaging \$378 per ton. The total receipts were, from milling ore, \$569,419; smelting ore, \$43,102; miscellaneous, \$3,205; total, \$615,726. The total expenses were \$450,920, leaving a balance of \$164,806. The details are given below.

In the milling department the table of results for the year is as follows: Number of wet tons crushed, 44,948 tons; number of dry tons crushed, 40,453 tons; average assay value of ore milled in gold, \$14.07, in silver \$5.11, making a total of \$19.18. Percentage saved according to assay was 72.16%; according to bullion returns, 71.35%. The pure gold produced as per bullion returns was 18,558 fine oz.; the silver was 276,026 fine oz. Value of the gold (realized at \$20.67 per oz.) was \$382,285; value

of silver (realized at \$0.6585 per oz.) was \$181,770; add for residues, etc., realized \$5,364, giving a total of \$569,419. This includes the ore worked by the Pelatan-Clerici process and the bullion obtained therefrom. The mill was in operation during the year (40-stamp basis), 290 days 4 hours; time lost during the strike, 42 days; ore crushed per stamp per day was 3.48 dry tons.

The average mining cost for the year, including its proportion of departmental charges and incidental expense, the costs in the prospecting department and all mine labor and supply expense amounted to \$5.30 per dry ton. A further sum of \$0.59 per ton must be added to the above as the cost of mining and marketing the shipping ore. The average milling cost for the year, including its proportion of departmental charges, etc., labor, supplies, repairs and all other mill expense, amounted to \$4.49 per ton. The extraneous expenses, etc.—the large items of which are: Taxes, \$3,500; insurance, \$5,000; F. Haggerty, compromise of suit for damages by man injured in mine, \$2,500; annual assessment work on claims, \$1,000—amounted to \$0.76 per ton, making total cost \$11.14 per dry ton. This is a reduction of \$0.50 per ton and would have been greater had it not been for the strike.

An analysis of costs per ton of ore treated in the mill for the year is given in the report as follows:

	Per ton, dry.		Per ton, dry.	
	Labor.	Cts.	Supplies.	Cts.
Superintendence and foremen.....	24.89		Chemicals.....	20.05
Crushermen.....	8.51		Lubricants.....	1.12
Batterymen.....	9.72		Illuminants.....	0.74
Tankmen.....	19.22		Fittings.....	0.35
Panmen.....	12.98		Castings.....	24.24
Pan-nelpers.....	11.41		Iron and steel.....	0.31
Repairmen.....	5.52		Lumber.....	1.99
Retortman.....	3.33		Coal and charcoal.....	3.85
Engineers.....	7.01		Belting.....	1.25
Firemen.....	4.83		Quicksilver.....	71.76
Machinists.....	8.83		Salt.....	12.14
Blacksmiths.....	3.29		Fuel.....	98.71
Watemen.....	9.26		Boils and nuts.....	0.23
Carpenters.....	8.30		Tools.....	0.36
General labor.....	7.02		Pipes.....	0.15
Wood and teams.....	6.07		Sundries.....	9.33
Oil and iron scraper.....	1.97		Assay office supplies.....	2.30
Assayer.....	4.05		Staple supplies.....	3.72
Storekeeper.....	3.78		Office and incidentals.....	1.66
Office expenses.....	5.25		Freight and expressage.....	23.54
Incidental expenses.....	1.51		Stationary and printing.....	0.48
			Telegrams and postage.....	1.57
			Legal expenses.....	2.30
Total.....	167.11		Total.....	282.21
Add supplies, etc.....	327.32		Insurance.....	10.83
			Extraneous expenses.....	16.30
			Freight and charges on bullion.....	17.98
				327.32
Total costs.....	494.43			

The prospecting and development work for the year included 254 ft. shafts, 1,953 ft. levels, 1,489 ft. drifts and crosscuts, and 407 ft. winzes and raises; a total of 4,103 ft. The ore in sight at the close of the year is estimated at 9,550 tons first-class, or over \$14 per ton, and 101,500 tons second-class, valued between \$14 and \$4, and probably averaging about \$5 per ton.

The report of Manager D. B. Huntley says: "Having formed a miners' union, and joined the Western Federation of Miners of America, on May 1st, 1896, the De Lamar miners struck for an increase of 50c. per day in the wages of all underground workmen. This was granted by the company, and work was resumed after a shut-down of about five weeks. On February 1st, 1897, mine wages, except those of carmen, were reduced 50c. per day, making a uniform rate of \$3 per day for underground laborers, skilled and unskilled. This last item is a peculiar hobby of Western American miners. The reduction was accepted by the workmen with some opposition, of course, but without a strike or loss of time at mine or mill. Had they not accepted the terms, they knew that the mill would be prepared to work tailings, and the mine be shut down.

"The new railroad from Nampa toward Silver City was opened for traffic on February 25th. It shortens the wagon haul about 15 miles. It is claimed that by July next a bridge across the Snake River will be completed and the railroad pushed still nearer—enough to reduce the wagon haul by 25 miles. This will make some reduction in general freight charges, and probably enable coal to be used, and stop the steadily increasing cost of wood fuel and mining timbers.

"Mechanical difficulties prevented the successful operation of the 50-ton Pelatan-Clerici plant erected last year, which was the first large plant ever put in operation for this process. Some changes and additions were made, making an experimental plant of 10 tons daily capacity. In this, nearly 500 tons of ore, in different lots, were worked in October, November and December, and especial care taken in sampling, assaying and cleaning up. A yield of 78% to 83% was secured. Believing that these were fair working tests, the installation of the remainder of the machinery for a 50-ton plant was agreed to. The delay in adopting the process was due to the change of managers and also to the time required for the changes, construction and transportation of the machinery. The reorganized 50-ton plant is now in operation."

A Peruvian Industrial Exposition.—An opportunity for makers of mining machinery will be afforded by the industrial exposition which is to be opened at Lima, Peru, on December 9th, 1897. In connection with this exposition the Peruvian Consul at New York has issued the following circular to manufacturers in the Eastern States, inviting their participation: "The Peruvian government, wishing to increase trade in the machinery and kindred lines with manufacturing countries, has decided to establish a permanent exposition of all classes of manufactured articles in the lines of machinery, giving preference to such as are mostly used in Peruvian agricultural implements, mining machinery, electrical appliances of every description and labor-saving machinery. The Peruvian government has never given such inducements to foster trade, and the facilities offered to American manufacturers are advantageous. All exhibits will be exempt from custom-house duties as well as from consular fees. The exhibition will be inaugurated on December 9th next at Lima, Peru. Exhibitors will have the option to show their wares for a period of six months. Should longer time be required arrangements may be made by applying to the officials in charge."

MINERAL PRODUCTION OF ALABAMA FOR JUNE.

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

The mineral production of the State of Alabama for the month of June and for the half-year ending June 30th, as reported by the producers to Dr. Eugene A. Smith, State Geologist and Secretary of the Alabama Industrial and Scientific Society, was as follows:

Material:	June.	Six months.
Coal.....	Tons 359,495	2,263,523
Coke.....	" 94,211	562,142
Iron ore.....	" 149,499	1,080,978
Pig iron.....	" 61,583	405,686
Limestone for flux.....	" 44,956	117,962
Bauxite.....	" 1,051	2,472
Building stone.....	cu. ft. 3,200	21,700

The number of employees in the mineral industries in June is estimated at 14,962, against 13,169 in May and 13,500 in April. It should be noted that coal and coke are reported in short tons of 2,000 lbs., while iron ore, pig iron, limestone for flux and bauxite are given in long tons of 2,240 lbs. Building stone is given in cubic feet. As compared with May there were considerable gains in coal and coke, a small increase in iron ore, while pig-iron production remained about the same.

The production of bauxite during the month of May from the Dykes District in Cherokee County was 727 tons. In these quantities of bauxite the shipments made by the Southern Bauxite Company have not been returned, and consequently are not included in the report. This company has changed its policy of shipping during the present year from that followed during previous years, and instead of hauling by wagons from the mines to Rock Run and shipping thence by the private railroad of the Rock Run Iron Company to Rock Run station on the East Tennessee, Virginia & Georgia Division of the Southern Railway, the haul is made to Cave Springs, Ga., direct from the mine and the railroad shipments made from that station on the same line, but about 14 miles east from Rock Run.

AN IMPROVED BICHROMATE METHOD OF ESTIMATING LEAD.

J. H. Wainwright, in the *Journal of the American Chemical Society*, XIX., 5, May, 1897, describes the following method of determining lead in "white lead," litharge, etc. Dissolve 1.0 to 1.20 g. in 10 to 15 c. c. HNO₃ (sp. gr. 1.20), neutralize with NH₄OH in excess, and add a considerable excess of acetic acid. Boil and titrate with a solution of potassium bichromate until nearly all the lead is down, when the solution should be boiled again until the precipitate of lead chromate, which at first is bright yellow, has become orange colored. The titration is then continued 0.5 cu. cm. at a time until the reaction is almost complete, which can be observed by the sudden clearing up of the solution, the lead chromate settling promptly to the bottom of the beaker.

If the solution is hot this will occur usually about 1 c. c. before the end of the reaction, which should then be completed, drop by drop, testing on a white plate with silver nitrate until a distinct red color is produced. The bichromate solution, which should be made up so that 1 c. c.—0.01 g. Ph., is best standardized against pure lead. The points to be observed in carrying out the method are: (1) the solution of lead salt should be as concentrated as possible before titration, and decidedly acid with acetic acid; (2) it should be free from other metals, especially such as may exist in lower forms of oxidation (antimony, tin and bismuth are to be avoided); (3) the titration should be performed with the solution as near the boiling point as possible; (4) the potassium bichromate solution should be neither too strong nor too weak; and (5) the solution of AgNO₃ should be dilute, not over 3%. With these precautions the objections to the ordinary bichromate method of determining lead are said to be overcome. The improved method is thought to be particularly adapted to such substances as white lead, red lead, litharge, pig lead and ores in which lead exists as carbonate. In the case of red lead, solution should be effected by HNO₃ (sp. gr. 1.20), boiling, and adding drop by drop, from a pipette, a dilute solution of oxalic acid until the oxide formed is completely dissolved.

If there is organic matter present this should be filtered off before titration. White lead may be dissolved directly in acetic acid, and titrated without filtration. In the case of pig lead, or alloys containing tin or antimony, the sample must be thoroughly oxidized and the solution filtered before titration; it is well, also, to precipitate the silver if present with a drop or two of HCl, the small amount of chloride arising thereby in the lead solution not interfering with the end reaction if the drop of silver nitrate solution on the test plate is made a little larger than ordinarily.

New Coal Deposits.—The discovery of stone-coal in the Jasina Valley of the Herzegovina is reported. Rich seams of stone-coal are also reported near Kremencz in Volhynia, Russia. The Russian Commission sent out to investigate the coal resources of Siberia found many rich fields, but especially in the valley of the Tom River, where seams of good coal, over 4 m. in thickness and only 55 to 80 km. from the line of the Trans-Siberian Railway have been exposed.

Sodium.—Sodium is made by the Castner process of decomposing sodium hydroxide electrolytically at Birmingham, England, at the rate of about 2,000 lbs. per diem, the product being worth about 50c. per pound. The process has been introduced at two or three places in Germany, and in the United States at Niagara Falls. The cost of making sodium by this process is kept a profound secret, and indeed very little of the metal is sold, the most part being consumed by the producers for the manufacture of sodium peroxide. It is said also that a good deal is used in the manufacture of potassium-sodium cyanide, it having been proved that when the yellow prussiate of potash is heated with sodium neither oxygen nor alkaline carbonates are introduced, the product being an almost c. p. mixture of sodium and potassium cyanides.

PAINT TESTS.

Max Toltz, in a paper read before the Civil Engineers' Society of St. Paul, December 7th, 1896 and printed in the *Journal of the Association of Engineering Societies*, June, 1897, has gone comprehensively into the comparative value of paints for protecting iron surfaces. The paints experimented with were (1) true asphaltic varnish paints; (2) so-called asphaltic varnishes, of inferior qualities; (3) black carbon paints, of which the vehicle is practically a varnish; (4) iron oxide paints; (5) graphite and silica graphite paints. Red lead was not tested. Within the last 10 years this material has been to a large extent discarded by progressive engineers, and although it has still warm advocates, even they are beginning to add carbon-black or graphite to it, says Mr. Toltz. One set of tests made by Mr. Toltz consisted in painting sheet-iron dishes, 12 in. diameter by 0.5 in. deep. The scale or skin was carefully removed before painting. Two dishes were then painted with each kind of paint, one receiving one coat and the other two coats, the first coat having dried at least a week before the second was put on. After the second coat had dried thoroughly, a given amount of water was placed in the dishes and allowed to evaporate at the ordinary temperature of the room, this being repeated until the dishes showed more or less rust. After most of the water had evaporated there remained at the junction around the edge a thin film of water, which in contact with the air and the carbonic and other acids of the air acted on the paint in such a way that the iron under it began to rust. In actual practice the same thing will happen, the only difference being that the rust will extend under the paint and will not show as plainly as on the dish. This is a severe test, but in Mr. Toltz's opinion, no paint which fails to withstand it is desirable for the protection of iron and steel structures. The cheap asphaltum paints and iron-oxide paints failed under this test. Another severe test consisted in exposing sheet iron coated with various kinds of paint to a temperature of 220-300° Fahr., this test being of value as showing promptly whether

30%, by weight, of the best quality of boiled linseed oil; the paste should be mixed with boiled linseed oil at the place where it is to be applied. No turpentine, no benzine and no Japan or driers should, under any circumstances, be allowed in this paint.

Fourth. There are certain parts of steel or iron bridges, viaducts or tunnels that should have an additional (third) coat of paint. These include such places, or parts of structures, as are directly exposed to the steam, fumes and gases from passing engines. For such a coat some cheaper asphalt paints, applied very thickly over the coats above recommended, would be all-sufficient. Such a coat would protect the underlying primary coats for many years, preserving their natural toughness and elasticity, and preventing atmospheric action on the structure.

From the investigations made, as well as from practical experiments, it appears that the iron-oxide paints are not very desirable, at least for the first coat or two, for iron or steel; but, as a third coat, for the protection of the underlying paints, they may be recommended.

However, the extensive investigation of the graphite paints that can be obtained in the markets to-day shows that, if properly applied, they are far superior to iron-oxide paints for the second or third coat, especially as they withstand the action of moisture and water much better than the best iron-oxide paint so far examined. Besides, a graphite paint, in paste form, well ground and mixed with boiled linseed oil, will not cost very much more per gallon than the cheapest iron-oxide paint in the market.

In recommending asphalt varnish paint or carbon paint for the first coat, great stress is laid upon the necessity of having the surfaces of iron or steel as free from moisture as possible while the structures are being painted, otherwise there is great danger that the coating will not adhere very firmly, and that it will thus actually nullify the value of the paint. This precaution is less important when an ordinary iron-oxide paint or red-lead paint, simply mixed with linseed oil, is used; because linseed oil itself has the property of absorbing moisture quite readily, whereas car-



DRIFT, ADIT LEVEL AND CHUTE, JOSEPHINE MINE, COLO.



LANDING, THIRD LEVEL, FRACTION MINE, CLEAR CREEK COUNTY COLO.

a paint will keep its elasticity or will become so brittle that it may be easily removed from the surface.

In the discussion which followed this paper exception was taken to various statements made by Mr. Toltz, but the expressions of opinion were generally in support of his conclusions.

From our present knowledge, the following system for painting iron and steel bridges and other metallic structures is recommended by Mr. Toltz:

First. Give the iron and steel a coat of the best grade of refined linseed oil, properly boiled and settled clear; or, still better, mix linseed oil with about 10% of a good grade of lamp-black; this coat to be applied at the mills, the iron or steel being first carefully cleaned from loose scales.

Second. After the structures have been erected, give them one coat of real asphaltic varnish paint, made from the best grade of asphalt, linseed oil and gum, compounded properly, so as to form a true varnish; or of a paint made from carbon black and properly boiled varnish, compounded of the best grade of linseed oil and gum. This coat should be carefully applied by a skillful painter, after the metal has been thoroughly cleaned from all loose scale, rust, shavings, filings, shriveled oil or paint, grease, dirt or any foreign matter, because it is of the utmost importance that the paint should be spread and worked in such a way so as to cover the surface properly, and be as free as possible from air bubbles and form a continuous coating. This priming or first coat should be applied fairly thick, the thickness depending, to some extent, on the nature of the paint used. Before the second coat is applied, the first one should be thoroughly dried and hardened by natural oxidation, which will require at least ten days. If practicable, it would be a great deal better, as well as more economical, to apply the second coat not less than four weeks after the first one.

Third. As a second coat, a good grade of graphite paint is to be applied as thickly as possible, working the paint thoroughly with the brush. From the examinations made of the various grades of graphite paints, as far as graphitic pigments are concerned, there appears to be but little difference between them, provided, of course, that the pigment contains at least 33% of pure graphite, the rest of the pigment being natural rock, ground very fine in pure linseed oil. The graphite paint should be bought in paste form, well ground, and contain not less than 70% of pigment and

bon or asphalt paint will not. The lack of this property in the two last-named paints is one of the principal reasons why they are superior to any other class of paints.

CHINESE GOLD AND SILVER MOVEMENT.

The movement of the treasure to and from China takes place chiefly through the Port of Shanghai. According to British Consular Report, No. 1951, Annual Series, the latest statistics of this port are as follows:

Year.	Imports.		Exports.	
	Gold.	Silver	Gold.	Silver.
	H. taels.	H. taels.	H. taels.	H. taels.
1890.....	7,830,000	1,788,000	8,975,000	5,462,000
1891.....	32,000	4,481,000	3,685,000	8,432,000
1892.....	345,000	6,585,000	7,632,000	4,130,000
1893.....	461,000	15,607,000	7,874,000	4,228,000
1894.....	40,000	30,872,000	12,748,000	3,947,000
1895.....	216,000	40,550,000	7,066,000	5,595,000
1896.....	654,000	12,225,000	8,853,000	

The net export of gold during 1896 is put down as 8,199,000 Haikwan taels, as against 6,850,000 taels in 1895. The most of this was shipped as gold bars to Germany by the German post-office as mail matter. With the opening of the mines under foreign supervision this export of gold would reach large dimensions, though not benefiting British trade unless the British post-office adopts the same policy as the German post-office.

Manganese in Russia.—The producers of manganese ore in the Caucasus have arranged an association for the control of the production and price of ore. The price has been recently about 8 kopeks per pood. A movement for reduction in railway freight has also been inaugurated, a reduction from 10 kopeks to 3 kopeks per pood being asked for.

THE WITWATERSRAND GOLD-FIELD AND ITS WORKING—VII.*

WHITE LABOR.

WRITTEN FOR THE ENGINEERING AND MINING JOURNAL BY W. Y. CAMPBELL.

Some 10,000 white men are employed by the Rand gold mining industry directly. A greater number still live on it locally, and form the towns of Johannesburg, etc. The municipal, mercantile, liquor and speculative bodies each thinks the industry is run for its benefit; none thinks he is or should be the servant or parasite of the industry, and that the interests of the industry should be put in the front rank of all. About 80% of the whites are British.

Our concern is with the white men who actually run the industry, and in the following tables we give the average wages paid. The mine equipments vary from 20 to 240 stamps. We will take an 80-stamp proposition as typical, with 90 whites and 1,200 natives employed. The native labor we will deal with separately and we here speak of whites alone.

Class.	Period. Per week.	Class.	Period. Per shift.
General manager.....	\$250.00	Mine shift bosses.....	\$7.25
Directors, town office clerks, town office rents, European agencies, stationery, law and general head- office expense.....	625.00	Blacksmiths.....	\$5.00 to 6.25
Mine manager.....	57.50	Drill sharpeners.....	5.00
Mill.....	50.00	Masons.....	5.00
Cyanide works manager.....	50.00	Bricklayers.....	5.00
Mechanical engineer.....	50.00	Carpenters and joiners.....	5.00
Mines accountant.....	43.75	Fitters.....	5.00
" clerk.....	30.00	Miners.....	4.25
Mine surveyor.....	43.75	Mine time-keepers.....	4.00
Ore sampler.....	25.00	Amalgamators.....	4.00
Storekeeper.....	22.50	Asst. amalgamators.....	3.25
Supervisor of natives.....	34.25	Cyanide workmen.....	3.25
		Engine drivers.....	\$4.25 to 5.00
		Compressor runners.....	3.75
		Surface men.....	\$2.50 to 3.00

Shifts are chiefly 12 hours gross, actually 9 to 10 hours' work in the 24. Contract work is not much resorted to at the mines, save for filling and emptying cyanide vats and for rock drilling. In the former case it is at so much a ton, in the latter per foot. Expert rock drillers from the United States can make up to double-shift wages in contract drilling. In such cases the contractor is supplied with everything and paid by the foot, or he is paid a fixed price per foot and pays for all supplies, labor and stores, the company merely finding the drills and air.

In nearly all cases housing is free, likewise fuel, light, water, sanitary appliances, part medical attendance, medicines, ambulance and hospital, reading and billiard rooms and outfits, servants in certain cases and mess-rooms. To arrive, therefore, at the true cost of white labor a further sum of about \$4.25 per head per week all around is required to cover costs or depreciation of those extras.

Lodging, etc., in the main being free, artisans and miners live well at their club messes, or co-operative boarding-houses at \$25 per month for three really good meals a day, and heads of departments mess costs about \$35 per month, alcoholic drinks alone excepted.

Compared with wage rates in other mining centers and concurrent costs of living, the Rand rate is high, and in consequence of this, and of the steady growth of a permanent industry, white workers have been coming in from the United States, Great Britain and Australia for the past two years at the rate of 500 to 2,000 a month. Last year, however, the Boer government took fright and passed two laws which have had the effect of stopping the steady influx for the moment, but the stoppage is, we believe, only temporary. Should immigration be stopped, the white artisans on the Rand could force wages to a height suicidal to themselves; since the rise would probably compel a closing down of the bulk of the mines from excessive costs, and the absence in capital and labor matters of ordinary economic laws. Besides, leaving politics entirely aside, the country is untouched in its mineral, arable and industrial resources and must have population.

The probabilities are that with a rational fiscal policy as to railroad freights, moderate tariff and consequent cheapening of board, clothing and lodging, white wages will fall considerably from the necessarily high standard fixed years back and continued since. The net income of the white artisan will not be affected, but the saving will show strongly in dividends to shareholders who are yet without interest on capital, though often crushing and mining at high pressure.

NATIVE LABOR.

About 75,000 African aborigines are employed in and on the Witwatersrand mines and their adjuncts. If other labor is not substituted, in a few years there will be probably 200,000 to 250,000. Fully 95% of them are raw and naked savages from the native locations. Their object is chiefly the acquisition of luxuries or the means wherewith to get married. A fair worker can, on the present extravagant scale of wages, earn all the luxuries he wants, plus a wife, in six months, and he then disappears from the white man's world for a year or two, probably returning after a time for more luxuries and another wife, and so on. The age of those "boys" is from 14 to 40 years, the bulk between 20 and 30. They come from hundreds of tribes and speak varying patois of the Bantu tongue, of which Zulu is the highest in the intellectual scale. They come from all points of the compass and from varying distances up to 500 miles, pluckily running the gauntlet of hostile tribes and Boer way-layers, practically foodless and on foot, and the survivors arrive at the mines emaciated and fit for little. A fortnight's feeding on unlimited maize meal sets them up as the raw material motive power of the great gold industry. In temper they are docile and easily taught barrow, truck or drill and hammer work; loud quarrelers among themselves, but orderly and deferential under good white discipline.

The industrial troubles with them are their prompt craving for the white man's "firewater," their natural tendency to loaf and desert from mine to mine, and the shortness of their stay after being trained. Fully 20% of the boys in every mine, though fed and housed, are not working; that is, one-fifth are always idle, and benevolently fed and housed free by the companies. Is native labor *per se* dear or cheap? is

the vexed question of the day on the Rand, and the replies are numberless and confusing. About 80% of the present workers are at work underground in the mines, and 20% on the surface, on the heaps, mills and cyanide works. The shift worked in the mines is, by a so-called arrangement among the mine owners, nine hours for the mine boys; as a matter of fact they, the mine boys, do not do five hours' fair work. The supply of boys is always far below the demand, and the managers fear pressing the boys for decent work, as they would soon leave the manager and give his mine a bad name. Thus on a mine with 1,000 boys on the books the average monthly analysis shows that 1,000 are housed and fed, but that only 800 units of 26 days' work are vouched for monthly. Fully 20% has to be added therefore to the cost of the 800 for the free keep of the 200. Those working, we have seen, only yield 50% of efficiency. The inclusive cost to a mining company of each boy is on the average \$22.50 per 26 working shifts of nine hours; in some companies it rises to \$25. A Pass or Regulation law was passed, but its administration so far has been limited to increasing the government revenue and decreasing the mines' labor supply. With the 500-mile radius spoken of above there are at least 1,500,000 available boys, and if the mine owners would only combine, the Rand native labor market could easily be swamped, and a fair wages level and fair work obtained. I am satisfied, and so are the leading mine managers, that it is quite possible to compass a reduction in the costs of Kaffir labor of 50% and an increase in efficiency of mining work done of 50%; all that is needed is that mine owners should pull together, and the Boer government should provide sufficient officials capable of aiding the public interest. Elsewhere I have shown that 33% of the mining cost is native labor, so that the underrated importance of this point is clear. Of course, the remedy will come, but the past and present tolerance of such a huge drain on the available yield is regrettable by the shareholders. The \$22.50 costs of native labor are made up as follows: Cash payment to native, \$15; food, \$2.50 to \$3; cost of touts and desertions, \$1.50; sanitary, medical, hospital, fuel, light, water, housing, pass law, liquor law and sundry petty items, \$3. No charge has been allowed for supervision, but doubtless to arrive at the true cost of native labor we should charge for the special trainers and the special supervision it requires, all of which is white labor and costly. In some mines there is one white to every 15 boys, and so on, till we get in others one white for every 50.

Chinese, Kuracheans, Italians, Indians are all proposed as substitutes for the native boy, but I am of opinion that if the boy question is taken up in a business-like way he will hold his own as a cheap and yet well-paid laborer. Surely an industry that is on a basis of millions sterling per month cannot long afford to drift and allow one huge department to be paid double wages for half effort in work. The expenditure in native labor on the gold-fields is put about £3,250,000 a year, and half that can be saved irrespective of better work being given.

THE DEVELOPMENT OF LAKE SUPERIOR IRON ORES.

By D. H. Bacon.

In this paper, read before the American Institute of Mining Engineers at the recent meeting, Mr. Bacon said that nearly up to 1860 the iron ore product of the Lake Superior region was handled over a mule tram road to Marquette. Now the Duluth, South Shore & Atlantic, the Chicago & Northwestern, the Wisconsin Central, the Duluth, Superior & Western, the Duluth, Missabe & Northern, the Duluth & Iron Range and the Lake Superior & Ishpeming railroads serve the shippers. Up to nearly 1870 a 700-ton ship was an enormous craft, the loading of which required two days, the unloading being seldom accomplished in that time. Now the cargoes reach 5,000 tons, the loading requiring less than three hours and the unloading 10 hours. In 1871 the largest ore barge carried 1,950 tons and made 12 trips per season. The annual shipments have grown from a few thousand to 10,000,000 tons and the ability of the mines to produce is not taxed. Lake freights are one-eighth of early prices and rail freights one-quarter.

The deeper waterways, commodious locks and large ships of to-day are in a greater measure due to the movement of ore than to any other cause. Great savings have been made in each detail of each department. The only cost that has not been lessened is the cost for money paid to men; for wages, measured by what they will buy, are as high now as at almost any time past.

As illustrating the cheapening that has been effected, ore is sold to-day at Lake Erie ports for \$1 per ton less than in early times it actually cost to mine, and this is done without loss, and further economies may be expected. Many men remember sales of ore in Pittsburgh at \$18 per ton, or about the present price of steel rails at mill.

Beginning with a few grades, the Lake Superior mines now offer ores from the purest and best to those that will not bear transportation, and within these limits can be found the varieties needed for general and special products, and in quantity equal to any demand.

The early methods were very crude. Horses furnished the power, and they were worked in all possible and almost impossible places. The little machinery then in use was poor and often but ill adapted to the work. The first hoisting plant of large size, economical design and equal to future demands was set up at the Lake Superior mines in 1880. Now single, compound, triple and condensing engines of large power are found throughout the iron ranges for hoisting, pumping and compressing. The hammer has been supplanted by the power drill, and electric motors and rope haulage are common above and below ground. Underhand, back and breast stoping, square sets, caving sets, saddlebacks, filling and milling are common. Steam shovels and locomotives have taken the places of hand shovels and carts. Every known system has been or is in use. Many mines have presented difficulties which would in the early days have been considered insurmountable, but each has been overcome. To one closely identified with this industry for nearly 30 years no single change has seemed important, and only by looking backward can one measure the advances. The early operators had little knowledge of ore deposits, their position in relation to associate rocks, their dip, pitch, strike, depth and many other facts, an understanding of which is necessary to continued success. This knowledge has been acquired, and with it have come right courage, true economy in place of parsimony, the general development of ore supplies far beyond immediate needs, and a thoughtful preparation for the future.

* No. I. of this series appeared in the *Engineering and Mining Journal* for June 19th, page 631; No. II., June 26th, page 659; No. III., July 10th, page 36; No. IV., July 17th, page 67; No. V., July 24th, page 96; No. VI., July 31st, page 130.

Nitro-glycerine and power drills have done more to reduce cost than any other two changes. In 1871 a drift was driven at the Cleveland mine at a cost of \$100 per foot. Now the cost would not exceed \$16.

In speaking of mining methods, the caving system was mentioned, which several claim to have invented or introduced. The first ore taken out by this method was mined at the Cleveland Hematite mine in 1883. The ore was very soft, with treacherous walls, and G. W. Wallace, the superintendent, tried what some of his men said was successful under like conditions in England. It proved satisfactory and is now known as the caving system. John Pungelly was sent to the Cleveland Hematite to learn the method so that he might use it at the Brotherton mine.

A look at the past may tickle our vanity, but our interests are in the future. Can we maintain the present output? Can we increase it? For how many years can buyers depend upon Lake Superior for their supply?

The discovery and quick development of the Mesabi profoundly affected the iron and steel industry of this country in every branch, and the effect may extend beyond our shores. The opening of the Mesabi does not mean idleness on other ranges, but does mean for them greater economies and smaller profits. The new range competes with itself as well as with others. But each era of depression brings a reward in the better methods that are forced upon us, and which, continued into days of prosperity, increase the volume of business, and to that extent the profits. With the low prices that are here to remain, it is more than ever difficult to estimate the annual consumption.

Speaking of the several ranges as one, the acreage of known ore is but a small part of the area that may contain ore. Discoveries are still being made in the Marquette district, the exhaustion of which was expected 20 years ago. The known ore under the bed of Lake Angeline is four times as great as was all the known ore in all of the mines of that county at any time prior to 1887. The past few years have not encouraged prospecting, but given favorable conditions we may confidently depend upon important discoveries. For 40 years this region has met all demands, and its resources are to-day, as compared with demand, greater than any time past.

German Iron Production.—The output of the German blast furnaces in May reached a total of 579,613 metric tons. For the five months ending May 31st the total production was: Foundry iron, 440,442 metric tons; forge iron, 689,602 tons; Bessemer pig, 229,938 tons; Thomas (basic) pig, 1,439,530 tons; total, 2,799,512 tons. This shows a total increase of 203,039 tons, or 7.8%, over the corresponding period last year.

The Cowper-Coles Gold Precipitation Process.—According to this an aluminum cathode is used in precipitating gold from cyanide solution instead of sheet lead, as in the Siemens-Halske method. It is claimed that the gold can be readily stripped off from the aluminum cathodes, and that they have been employed successfully with solutions containing only 0.01% KCy and 2.5 dwts. gold per ton of solution. If these claims are substantiated in practice, and unforeseen difficulties do not appear, the improvement is likely to be of considerable importance.

Testing Asbestos Board.—According to *L'Industrie*, asbestos board of good quality weighs about 1 kg. per square meter for each millimeter of thickness; it ought to resist a dynamometric tension of 400 to 500 grams per millimeter of section. In order to judge the purity of asbestos board it should be reduced to a paste for 15 mm. in 500 c.c. of warm water. The paste is then transferred to a sieve of No. 30 to 32 wire cloth, and washed several times to remove foreign matter. The residue is then dried, without calcination, and weighed. The loss in weight from the amount originally taken should not exceed 20 to 25%. Testing asbestos board by calcination is less conclusive than the washing test, since it does not show if it contains such foreign matter as China clay.

Asbestos Manufacture in France.—The French manufacturers of asbestos goods are supplied from four sources: 1. Canada, whence the asbestos is white silky, very unctuous, having supple fibers from 5 to 25 mm. in length; of all varieties it is that which spins the most easily. 2. Siberia, whence the mineral is yellowish, some species from the straw yellow. The fiber is less flexible than the Canadian, more woody and dry, but stronger. Their length is about the same as the Canadian, but large masses of long fiber mineral are rarer. 3. The Cape of Good Hope asbestos has a characteristic blue color. It comes in larger pieces than either the Canadian or Russian, and their fiber is generally longer and stronger. In spinning or other manipulation, however, it is difficult to handle them, a good deal of the fiber being reduced to powder. 4. In Italy there are different kinds of asbestos, but generally they are little adapted to spinning. There are some long silky fibers of little resistance employed for gas furnaces and others which are very short and fit only to make heat-retaining coverings.

Electro-Chemical Works in Sweden.—Although there are several plans to the fore in Sweden about important electro-chemical manufactories, to which the abundant water power lends itself admirably, says *London Engineering*, there are not yet many in operation, the most important being the one for manufacture of chlorate of calcium at Mansbo, where the process used is the one patented by Mr. O. Karlson. The Mansbo waterfall represents the aggregate power of about 5,000 H. P., of which, to begin with, only a smaller portion was utilized. There were eight turbines of 220 H. P. each, revolving at a speed of 260 revolutions per minute; they have horizontal axes, and are directly coupled with their dynamos. The normal capacity of the latter is 1,200 amperes, 115 volts, and they are being worked both day and night. The machines work independently of each other. The current is conveyed from the dynamos to the electrodes, of which the one is of carbon, the other of iron. The original output was fixed at 690 tons per annum, but this has been found altogether inadequate; the installation has therefore been extended very materially, and now represents 3,000 H. P., and an annual output of some 1,300 tons. The whole installation has cost rather more than \$400,000, the cost of machinery and plant being about equal to that of the necessary construction, which were required in order to utilize the water power.

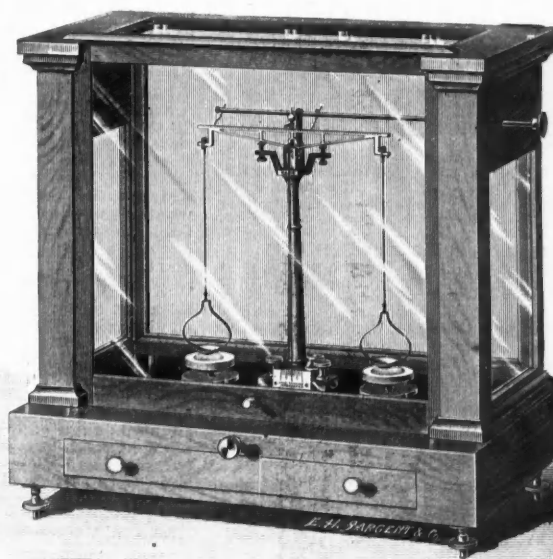
RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

COAL LANDS AND STOCK SUBSCRIPTION.—The promoter and president of a corporation capitalized at \$5,000,000 subscribed for substantially all the stock and undeveloped coal land, for which he had just paid about \$70,000, was taken in full payment of the stock. The court held that under a statute requiring the capital stock of a corporation to be subscribed before it can do business, in the absence of any explanation of the over-valuation, such subscription was fraudulent.—*Manhattan Trust Company vs. Seattle Coal and Iron Company* (48 Pacific Reporter, 333); Supreme Court of Washington.

THE SARGENT SHORT-BEAM ASSAY BALANCE.

The great popularity of the Sargent analytical balance, which was described in the *Engineering and Mining Journal* for March 5th, 1895, has led Messrs. E. H. Sargent & Company to place upon the market a short-beam balance for assay work. The balance is made by Henry Troemner after designs furnished by them. The beam is about 7 in. long, made of pure aluminum, and graduated upon both sides. The bearings are of agate; it is sensitive to the one-hundredth part of a milligramme; the case is made of polished French mahogany, with glass top for admitting light to the beam and heavy glass bottom upon which rests the balance.



THE SARGENT SHORT-BEAM ASSAY BALANCE.

This balance is so constructed that much time can be saved without loss of sensibility. It is shown in the accompanying illustration.

Spanish Lead and Silver Mines.—According to the *Revista Minera*, the mining industry of the province of Badajoz is making rapid strides. Important deposits of lead ore have been discovered in the district of Puebla de Alcocer and at Penalsordo, Capilla and Garlitos. At the last-named locality mining is to be started on a large scale, as the ore contains 70 oz. of silver to the ton. At Penalsordo several mines are being worked with very satisfactory results.

Blast Furnaces in Great Britain.—The total number of furnaces in the United Kingdom on June 30th was 692, of which 380 were in blast. The number of furnaces on March 31st was 683; on December 31st, 1896, 685; on September 30th, 1896, 690; and on June 30th, 1896, 690. The number of furnaces in blast on March 31st was 379; on December 31st, 372; on September 30th, 1896, 373, and on June 30th, 1876, 375. As in this country, the list contains a number of old furnaces which have been practically abandoned and will never be in blast again.

An Aluminum-Zinc Alloy.—W. F. Durand in *Science*, 5, 396, states that of the alloys of zinc and aluminum, one composed of two-thirds aluminum and one-third zinc gives the best results, showing itself equal to good cast iron in strength, and superior in many other qualities. It melts at about 800° Fahr., does not really oxidize, takes a fine finish, and perfectly fills the smallest parts of a mold. Like cast iron it is brittle, but it is recommended when lightness and strength, combined with good finish and resistance to corrosion, are among the desiderata.

The Estimation of Zinc.—Messrs. L. L. de Koninck and Eug. Prost have made an elaborate investigation of the volumetric determination of zinc by potassium ferrocyanide, which is described in *Chemical News*, July 9th and 16th, 1897. In summarizing their results they state that the reaction is more regular and its termination more sharply marked if the ferrocyanide is always in excess with respect to zinc, e. g., if the zinc solution should be run into the ferrocyanide. This involves inverse titration, which is not very practicable, or else to titrate back. The latter method has the advantage of showing the approaching termination of the reaction by the diminution of the intensity of color produced by the indicator; for these reasons the authors give preference to this method.

PERSONAL.

MR. K. C. BARTON, of the Omaha & Grant smelter, has gone on a visit to Salt Lake City.

MR. BERNARD McDONALD, mining engineer of Butte, Mont., was recently in Rossland, B. C.

MR. NAPOLEON WELLS, of New York, is visiting some of his mining ventures on the Pacific Slope.

MR. AL. DICKERMAN, of Colorado Springs, Colo., has left for Utah to make an examination of the Meicur mines.

MR. G. H. ROBINSON, mining engineer, of Salt Lake City, has been spending a short time in New York City.

MR. FRANK HUNTER, deputy mine inspector of Montana, has been investigating the Zosel and Colona districts.

MR. BENJAMIN THAYER, who has charge of the mining interests of the Hearst estate, is now in Butte, Montana.

MR. H. P. SWANBECK, of Cripple Creek, Colo., and others have been visiting the western parts of Bernalillo County, New Mexico.

MR. H. E. PORTER, a man who has been prominently connected with the Kaslo section of British Columbia, has left for Klondike.

MR. H. P. LOWE, of Denver, has been examining one of the big properties at Idaho Springs, Colo., for a syndicate of Eastern capitalists.

MR. GEORGE GOODERHAM and MR. T. G. BLACKSTOCK, who are largely interested in the War Eagle mine, have been on a visit to Trail Creek and Nelson, B. C.

MR. HOWARD C. WALTERS, a prominent mining man of Trail Creek, has returned to Rossland, B. C., after an absence of six months in the Eastern provinces.

MR. W. E. RENSHAW, of Idaho Springs, Colo., and owner of the Gem and Gem Extension mines, is in New York this week conducting important mining negotiations.

MR. G. M. KING, until recently superintendent for the Work Mining Company at Cripple Creek, has gone to the Klondike gold fields in the employ of a Colorado Springs Syndicate.

MR. J. E. CHESTER, of Idaho Springs, Colo., for many years in charge of the Joe Reynolds mining investments in Colorado, is now in Boston completing some mining negotiations.

MR. H. PENGELY, of Nevada City, Cal., has been appointed Superintendent of the Good Title Mine at Dobbins' Ranch, in Yuba County, Cal., in place of MR. J. J. DAILEY, who has resigned.

MR. A. E. PALMER, of Vancouver, B. C.; MR. D. RYAN, of St. Paul, Minn., and MR. S. P. DONNELLY, of Lakeview, Minn., have recently visited Seattle, Wash., after paying some attention to the mining region to the north of that city.

MR. W. H. WILEY departed this week from Idaho Springs, Colo., to examine certain Western properties for the Rothschild syndicate. He has devoted much of his time the past year to this work for these people.

MESSRS. HENRY BRATNOBER, NATE FULLER and T. SUNNY have left San Francisco for the Yukon. They are all extremely well-known mining men, and their report will be looked forward to with much interest.

MR. S. P. MAHAN, the manager of the Albemarle mine, Cochiti, N. Mex., is in Los Angeles on a visit to his family. During his absence the extensive work on the Albemarle is under the superintendency of MR. B. D. WILSON.

MR. HENRY R. WALCOTT, of Denver, is visiting Butte City, Mont.; he is on his annual tour of inspection, looking after the interests of the Colorado Smelting and Mining Company, of which he is an official, as well as a large stockholder.

MR. GEORGE E. HARMON, of Chicago, president and general manager of the Pulaski Mining Company, owning the Pusin, has been in Telluride, Colo., superintending the construction of a steam stamp mill in close proximity to the mines for the treatment of the ore.

MR. E. McNEILL, receiver of the Oregon Railroad and Navigation Company, was in Dillon, Mont., last week on his way to Bannack to inspect the property of the Chicago Mining and Development Company, whose president he is. He was accompanied by M. B. CAMPBELL, W. H. HURLBUT and GEORGE McNEILL.

MR. H. C. HOOVER has been appointed manager for Bewick, Moreing & Company, in Coolgardie, Western Australia, succeeding Mr. H. P. WOODWARD, who has resigned. Mr. Hoover is an American engineer, who has had charge of mines in California, Arizona and New Mexico, and who was recently connected with Mr. Louis Janin in San Francisco, as a consulting engineer.

MAJOR IRVING A. STEARNS assumed charge of the Delaware, Susquehanna & Schuylkill Railroad and all the coal interests of Coxe Brothers & Com-

pany on August 1st, succeeding MR. ALFRED WALTER, who is now president of the Lehigh Valley. Major Stearns is well qualified for his new position, being thoroughly familiar with the anthracite trade. He graduated from the Rensselaer Polytechnic Institute in 1868, and was for some time in the office of Mr. Richard P. Rothwell as a mining engineer. He was subsequently connected with the McNeal Coal and Iron Company at Mahanoy City, and later entered into partnership with Mr. Bowden, now chief engineer of the Susquehanna Coal Company. In 1885 Major Stearns was appointed manager of the anthracite coal companies controlled by the Pennsylvania Railroad, and held that position until a few days ago.

OBITUARY.

JOHN RUDBERG died at Idaho Springs, Colo., July 26th. He was one of the best known characters in that section of the State and for a number of years has been identified with the various mining undertakings. At the time of his death he was operating the Silver Age mine, on Seaton Mountain, and the Newton mine, on Chicago Mountain, both numbered among the big producers of the district.

SAMUEL LEWIS, one of the oldest—if not the oldest—of the ironmasters of Eastern Pennsylvania, died in Allentown, Pa., August 1st, aged 92 years. He founded the Allentown Iron Works in 1846 and continued as superintendent until 1878, building five furnaces and the Lehigh Rolling Mill. He was also a fire-brick manufacturer and interested in the Old Bangor Slate Company.

THOMAS WATSON, one of the best-known railroad contractors and coal mine operators in the United States and Canada, died August 3d in Chicago. He built the Caughanauga Railroad, now part of the trunk line from Montreal to New York. He built the Montreal & Lachine Railway. He also widened the Lachine Canal and built piers and wharves at Montreal. In 1858, at Cleveland, he built the piers for the Lake Shore Railroad. In 1871 he became interested in the coal business in Indiana. He organized the Delta & Pine Land Company, with property in Mississippi.

FRANK HIBBING, one of the pioneers of the Mesabi Range and the discoverer of the properties of the Lake Superior Iron Company, about Hibbing, now being worked by the Consolidated Company under contract, died last week at his home in Duluth, Minn., after an operation for appendicitis. He was a German, about 40 years old and leaves a wife and adopted daughter. After being told that he had but a few hours to live Mr. Hibbing sent for his stenographer and dictated business matters for an hour, with perfect clearness and self-control. He was a man of strong character and a general and great favorite in the iron country and in pine land circles in Michigan.

SOCIETIES AND TECHNICAL SCHOOLS.

CIVIL ENGINEERS' CLUB OF CLEVELAND.—A meeting was held July 13th, President Ritchie in the chair. Mr. Wm. E. Reed presented the paper of the evening, entitled "The 40-in. Equatorial of the Yerkes Observatory." It was a very complete description of the great telescope and the observatory in which it is mounted, illustrated by half tones from photographs taken during the erection, and of the completed structure. An interesting discussion followed in which Dr. Dayton C. Miller, W. R. Warner, and others took part. Messrs. George Isaac Allen, William Sanford Biddle, Lord Mortimer Coe, John Nash Coffin, Charles Ithamar Dailey, Ernest Winfield Hulet, Arthur Cameron Johnston, Francis Henry Prentiss, William Emerson Schroeder, George Edgar Titcomb and Rollin Henry White were reported as elected to active membership. It was voted to adjourn to the September meeting.

INDUSTRIAL NOTES.

St. Charles Furnace, at Columbia, Pa., has been dismantled. The stack was 52 x 14 ft. and was built in 1853. It has long been idle.

The Youngstown Bridge Company, of Youngstown, O., has secured the contract to construct a bridge over the Pymatuning Creek, on the Ohio-Pennsylvania State line.

The Reading Iron Company, of Reading, Pa., has abandoned its two Reading furnaces. The stacks are each 55 x 14½ ft., and were built in 1854 and 1873 respectively.

The new brick addition to the Stewart Enameling Works at Bellaire, O., is being pushed forward to completion. The output will be much larger when this additional room shall have been gained.

The two furnaces of the Port Henry Furnace Company, at Port Henry, N. Y., which were abandoned some time ago, have been dismantled. The stacks were each 66 x 16 ft., and were built in 1853 and 1861.

The two blast furnaces of the Hudson Iron Company, at Hudson, N. Y., have been abandoned. The stacks are each 50 x 15 ft., and were completed and put in operation in 1851. They have been idle for a long time.

Norway Furnace, of the Norway Iron and Steel Company, at New Castle, Pa., has been put in blast. At present the furnace is running on Washington coke, but will be operated before long on by-product coke exclusively.

Lynchburg furnace, at Lynchburg, Va., has been abandoned. Mr. Lee, the owner, expects to dismantle the furnace at once. It is 60 x 11½ ft., and was first put in blast in 1880. It has not made any iron for several years.

The plant of the Linden Steel Company, of Pittsburgh, has been sold for \$86,000. It was bought by the plaintiffs in the suit, H. Sellers McKee and the Pittsburgh Bank for Savings, whose executions against the property amounted to \$104,196.

The Cleveland Brass and Manufacturing Company, Cleveland, O., has equipped a plant to manufacture all kinds of castings in brass, copper, bronze and aluminum, and particular attention given to pattern and jobbing work in these lines.

The Hoffman, Billings & Weller Manufacturing Company, of Gadsden, Ala., are working about 100 men on full time, and often at night. This plant is the largest of its kind in the South and has enough orders ahead to keep running for the next two years.

The State Department has granted a charter to the Jeanesville Iron Works Company, Jeanesville, Luzerne County, Pa., to manufacture mining machinery, capital, \$200,000. Directors: J. C. Hayden, V. N. Rood, A. Bartholomew, T. M. Morris and Samuel Garner.

The Oliver Snyder Steel Company, of Pittsburg, has torn down its Rosena furnace, at New Castle, Pa., and is building an entirely new furnace on the site of the old stack. The company expects to have the new furnace completed and ready to blow in about October 1st.

The steel plant of the Birmingham Rolling Mill Company is now running. The analysis of the first "run" has proven a success. The mill is making one every day, and the ingots are being laid up to go to the rolling mill. There are intimations of other industries using steel locating in that section.

An order from Russia for four large blast-furnace blowing-engines has been received by the Southwark Foundry and Machine Company, of Philadelphia. The engines are to be of the vertical compound type, and will probably weigh upward of 504 tons. These engines are for two blast furnaces which are at present under construction.

The Beaver Valley Traction Company, of Pittsburg, Pa., has decided to remove its car barns from Beaver Falls to a point just outside of New Brighton borough line, beyond Third avenue. The new building will be almost 500 ft. in length, and will be large enough to accommodate all the cars belonging to the company. The plans are now in the hands of contractors.

The Hoffman-Billings-Weller Pipe Company, of Gadsden, Ala., has received an order for pipe which will keep the plant in operation for two years. This is the largest oil-pipe factory in the South with one exception, and was recently moved from Milwaukee. The concern will be enlarged immediately and 125 extra men will be put to work. These works may soon be the largest oil-pipe works in the world.

Okura & Company, of Kobe, Japan, have just contracted to have three 500-H. P. Pelton impulse water wheels built. This machinery, with other purchases which are yet to be made by the above Japanese firm, are to be used in an electric railway plant. The contract, our informant says, was secured by the manufacturers in this country in the face of severe competition with German and other European firms.

Napier Furnace, at Napier, Tenn., has given up the manufacture of charcoal pig iron, and will hereafter produce coke pig iron only. The furnace is 60 x 12 ft., was built in 1891 and blown in early in 1892. An experimental blast with Virginia coke as fuel was made in May last, but the boiler power was found to be insufficient and the furnace was blown out in order that additional boilers might be put in.

The annual meeting of the stockholders of the Ohio Steel Company, Youngstown, O., manufacturers of Bessemer steel billets, sheet and tin bars, was held in Youngstown recently and the following directors were elected: J. G. Butler, Jr., James Parmales, Henry Wick, George D. Wick, Myron C. Wick, E. L. Brown, E. L. Ford and Tod Ford. Henry Wick was chosen president, and W. H. Baldwin, secretary and treasurer.

The board of directors of the Youngstown Foundry and Machine Company, of Youngstown, O., formerly known as the Girard Stove and Foundry Company, recently organized by electing the following officers: Thomas Parrock, president; W. J. Wallis, vice-president and manager; F. A. Williams, secretary and treasurer. It is understood that great alterations and additions will be made to the plant in order to increase the manufacture of rolls, castings, etc.

The King, Gilbert & Warner Company, Columbus O., has abandoned and dismantled its Moxahala furnace at Moxahala, O. The company has completed a new stack at South Columbus, it will b

known as the Steelton Furnace, will be 80 x 18 ft. and will be equipped with three Massicks & Crooke hot-blast stoves. Pocahontas and New River coke and Lake Superior ore will be used, Bessemer pig iron will be produced, for which the furnace will have an estimated annual capacity of 120,000 gross tons.

The Colbert Iron Company, operator of the Hattie Ensley and Lady Ensley furnaces, at Sheffield, Ala., has made an assignment, naming R. J. Thurmond, Jr., of Sheffield, assignee. The company also operated extensive ore mines near Fusselville, Ala., and individual members are largely interested in the West Point (Tenn.) Mining Company, but it is claimed that that company is not involved. The company employed 600 men at its furnace and in the mines. The liabilities are estimated at \$60,000, while the assets are not known.

Articles of incorporation of the Taylor Air Compressor Company have been placed on record at Spokane, Wash. Its object is to operate the patent rights of the Taylor Hydraulic Air Compressing Company of Canada in the States of Washington, Idaho, Montana and the Province of British Columbia. The trustees and directors named are: R. L. Murchison, Joseph S. Fair, Charles H. Taylor, all of Montreal, Canada; and Lane C. Gilliam, W. S. Norman, Charles G. Reeder and M. M. Cowley, of Spokane. The capital stock is \$1,000,000, divided into 1,000,000 shares of \$1 each.

The Pittsburg Reduction Company is in receipt of an order from the Atlantic & Pacific Aerial Navigation Company for 120 sheets of aluminum, hardened with 1% of copper. These sheets are 16 ft. long, 2 ft. wide and 0.01 in. in thickness. They are intended for an air ship. At the Pittsburg Reduction Company's works at New Kensington, Pa., extensive improvements have just been completed. An iron floor, 125 x 75 ft., has been put up by the Shiffer Bridge Company, of Pittsburg, in the calcining house. The building of the new floor required about a month's time. It greatly facilitates the handling of material in the calcining-house.

At a meeting held recently at the office of the Etna-Standard Iron and Steel Company, in Etna-ville, O., the consolidation of the Etna-Standard Iron and Steel Company and the Junction Iron and Steel Company of Wheeling was completed, and the Junction Company has been absorbed by the Etna-Standard. To make room in the board of directors of the Etna-Standard for three representatives of the Junction Company, three directors tendered their resignations. They were Alonzo Loring, Joseph Bell and J. A. Topping. Their places are taken by George Dean, Ambrose List and Captain Urquhart. Mr. Topping, however, remains in his position as secretary of the Etna-Standard Company. The agreement provides that the capital stock of the Junction Company shall be replaced by the same amount of stock of the Etna-Standard Company, \$700,000. This makes the capital stock of the Etna-Standard \$5,000,000.

The Denver Engineering Works, of Denver, Colo., has just shipped to the Esperanza Mining Company, of El Oro, Mexico, one of their new patent mine-timber framing machines. This machine will cut the timbers on mine timbers round or square, cutting both ends at one operation any size up to 16 in. diameter and 10 ft. long between shoulders. The machine can be operated by one man and a boy, and will do the work of 22 men in getting out mine timbers. Most of the large mining companies in the West are commencing to use these machines. They are at present unable to fill their orders for the New Denver crushing rolls, and are now erecting a 100-ton crushing and concentrating mill for the Yellowstone Mining Company, who are using these rolls entirely for crushing purposes. They are running their works full time and report prospects as very good for this fall's trade.

The Newport News Shipbuilding and Dry Dock Company are making extensive additions to their already large plant at Newport News, Va. One of the additions under way is the erection of an extension to their machine shop. It will be 100 ft. wide and 200 ft. long. This building will be used for the finishing and erecting of marine engines and other large machinery necessary in connection with the mammoth steel vessels which this company have under way. The central portion of the building will be 30 ft. high, and is to be supplied with an electric traveling crane capable of lifting and carrying a load of 50 tons. On either side of this central space will be located a gallery arranged for small machines and fitting tools. The building is to have a steel framework throughout, and the roof is to be covered with corrugated iron. The Berlin Iron Bridge Company, of East Berlin, Conn., have the contract for furnishing and erecting the steelwork of the building.

TRADE CATALOGUES.

The Barnes Tool Company, of New Haven, Conn., have just caused to be printed a useful illustrated circular and price list of the E. F. B. self-feeding hand-sawing machine, as well as one of the plumbers' tools they manufacture.

The well-known firm of James Lefell & Company, Springfield, O., has issued a neat, new pamphlet "D," replete with numerous illustrations and descriptions of the throttling and automatic engines,

with portable and stationary boilers, which they are building in a variety of sizes and styles.

A very full line of hydraulic tools, cranes and machinery is manufactured by R. D. Wood & Company, Philadelphia, Pa. All these are very fully described in a catalogue just from the press. The Camden Iron Works, controlled by this company, is equipped with modern tools, from boring-mill to small lathes, so that facilities for production are most excellent.

For those about to open and develop a mine from the "grass" a careful study of the new illustrated catalogue of "Common Sense Mining Machinery," just issued by the J. H. Montgomery Machinery Company, of Denver, Colo., may be recommended. Every mining requisite from an agitator to a pipe wrench is catalogued, and the prices are invariably down to bed rock.

The "Illustrated and Descriptive Catalogue of Hardware Specialties" manufactured by the Phoenix Hardware Manufacturing Company, of Phoenix, N. Y., has reached us. Everything illustrated is manufactured in the company's own works, so they are able to guarantee the quality of all they sell. Vices, sash chains, lathe dogs, clamps, door springs and many other articles of a similar character are figured in this pamphlet.

Presses, foot, drop and screw, are the subjects of which mention is made in the catalogue of the Waterbury Farrel Foundry and Machine Company, of Waterbury, Conn. These are, of course, only some of the many lines manufactured by this well-known concern, and any inquiries relative to hydraulic machinery, bicycle machinery, rolling-mill machinery, hardware machinery or tube-mill tools will receive prompt attention.

NEW PATENTS.

UNITED STATES.

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

WEEK ENDING JULY 27TH, 1897.

586,970. METHOD OF AND APPARATUS FOR MANUFACTURING CARBURETED WATER GAS. Alexander C. Humphreys, Philadelphia, Pa., and Arthur G. Glasgow, New York, N. Y. The method consists in passing the water gas formed in the generator upward through a preliminary carbureting chamber, and thence through main carbureting and fixing chambers, thence through a surface condenser or condensers, injecting into the main carbureting chamber liquid hydrocarbons and introducing into the preliminary carbureting chamber the heavy hydrocarbons condensed in the surface condenser.

586,981. GRINDING MILL. James F. Winchell, Springfield, O. Assignor to the Foss Manufacturing Company, same place. The combination with a base having standards rigidly secured thereto at one side of its middle, a shaft mounted in the standards and having a grinding head, and having on the other side of the middle two bearings depressed in its upper surface at or near the corners and a standard plate fitted to rest upon the latter portion of the base, and having two rounded projections forming journals fitted into the depressed bearings, standards rigidly secured to the standard plate, a shaft mounted in the standards and a grinding head on the shaft.

586,982. PROCESS OF AND APPARATUS FOR MAKING GAS. William F. Browne, New York, N. Y. The process consists in burning a combustible gas or vapor in contact with a body of carbonaceous fuel, thereby heating it to incandescence, and passing the resulting products through the incandescent fuel, producing water-gas, and, by means of such hot water-gas, heating generating-coils, and, at the same time, generating hydrocarbon gas by forcing water and hydrocarbon oil or carbonaceous material through the heated coil.

587,052. APPARATUS FOR MANUFACTURING OR PRODUCING METALS FROM THEIR ORES. Wladimir F. Berner, St. Petersburg, Russia. Patented in Luxemburg, October 14, 1893, No. 1,916. The combination of twin blast-furnaces, valved gas-ducts connecting the furnaces at different levels, means for supplying a combustible gas to the furnaces, and appliances constructed, arranged and operating so that one of the blast-furnaces can be operated as a reducing-furnace, and the other as a decarbonizing furnace, and the furnace-gases utilized in such operations.

587,055. BORING APPARATUS FOR DEEP BORINGS WITH OSCILLATING BEAMS. Anton Raky, Rupprechtsau, Germany. Patented in Germany August 24, 1896, No. 91,566, and in Switzerland August 5th, 1896, No. 12,891. In an apparatus having an oscillating beam supported by its support, of another support for the oscillating beam; the other support being carried by the springs, and means for changing the distance between the beam and the supports.

587,068. PROCESS OF AND APPARATUS FOR ROASTING ORES. Charles W. Suckney, Ketchum, Idaho. The process of recovering sulphur in solid form from ore, by forcing currents of steam, and air under pressure, and gaseous fuel, composed largely of hydrogen under pressure, simultaneously into contact with the red-hot ore, and regulating the quantities of steam, air and fuel in such proportions that the ore is maintained at or above a red heat, while there is approximately no excess of either free sulphureted hydrogen, or free sulphurous acid in the final resulting gases, and cooling the vapors below the vaporizing point of sulphur.

587,079. PROCESS OF EXTRACTING GOLD FROM GOLD ORES. Wilhelm Majert, Falkenberg, Germany. The process consists in treating the ore in a finely divided condition with a solution containing free hypobromous acid, in the presence of such a quantity of an alkaline salt of an alkali metal as contains a sufficient amount of alkaline metal to combine with all of the free acid present, and precipitating the gold from the solution.

587,105. MANUFACTURE OF STEEL INGOTS. Niven McConnell, Munhall, Pa. The process consists in tapping steel from the furnace in which it has been refined, pouring it into an ingot mold, and adding to it in the mold a small percentage of aluminum.

587,128. PROCESS OF TREATING ARGENTIFEROUS SULPHIDE ORES. Ernest F. Turner, Adelaide, South Australia. The process consists in disintegrating the sulphide ores by the combined action of aqueous and gaseous hydrochloric acid, whereby sulphureted hydrogen is produced, passing the acid gases successively through fresh batches of the ore until the hydrochloric acid is neutralized, and utilizing the H₂S as fuel in the process of extraction.

587,138. PROCESS OF AND APPARATUS FOR MANUFACTURING METALLIC CARBIDES. Isaiah L. Roberts, Niagara Falls. The process consists in establishing between electrodes within a non-conducting mixture of pulverized or granulated ore or oxide and a reducing agent, a conducting path of material which will be heated to incandescence by the passage of a current, passing electricity through the path and by the heat therefrom conveying the adjacent portions of the mixture into a conductive body, and gradually drawing the mixture between the electrodes in the direction transverse to the direction of flow of the current through the path, whereby successive portions of the mixture are successively brought into the heating-field and thereby converted into a conducting-body and caused to act as an incandescent conductor to reduce the adjacent portions of the mixture.

587,171. CENTRIFUGAL SEPARATOR. Edward W. Beach, Elgin, Ill. Assignor to the De Laval Separator Company, of New Jersey. A centrifugal separator bowl having an independent compartment in connection with a charging inlet, the main body of the bowl being divided into a series of compartments by shells having a vertical portion and a portion extending toward the center of the bowl, provided with passages projecting into the contiguous compartments whereby the heavier liquid is delivered from compartment to compartment beyond the heating-field and into the heavier liquid of the compartment, and openings from the independent compartment to one or more of the compartments of the bowl.

587,179. TREATMENT OF GOLD AND SILVER ORES. Joachim H. Burfeind, Salt Lake City, Utah. An improvement in the extraction of precious metals from their ores, consists in the treatment of the cyanide product or precipitate containing the metals, preparatory to melting the product with sulphurous acid.

587,182. ELECTRIC FURNACE. Guillaume de Chalmot, Leaksville, N. C. Assignor to the Wilson Laboratory Company, New York, N. Y. The combination with a carbon pencil, of a crucible or hollow hearth into which the pencil may enter, and independent mechanism connected thereto for agitating or jarring the crucible in order to shake down the granular material fed thereto, and facilitate the feeding thereof into the arc.

587,220. OIL WELL PUMPING RIGGING. John N. Maher, Franklin, Pa. The combination with a base, a bevel gear wheel mounted thereon, a bevel pinion also mounted thereon, a crank on the bevel gear wheel, and means for rotating the pinion; of a standard mounted on the base, a spindle formed on the standard, a shoulder at the junction of the spindle and standard, a drum mounted on the spindle and connected with the crank on the bevel gear wheel, and means for connecting the drum with the pump rods.

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.

THE COAL MINERS' STRIKE.—The main interest of the past week has centered on the efforts made to bring out the men at the DeArmitt mines and those of the New York & Cleveland Gas Coal Company, in the Pittsburg region. These have been partly successful, and work has been very nearly stopped there.

In West Virginia the situation is unchanged, and the miners are generally working with the exception of those at Monongah and part of the Fairmont men. The Kanawha and Flat Top mines are making a large and steady output.

The next attempt to extend the strike is to be made in Central Pennsylvania. The miners in the Reynoldsville District, which ship chiefly to Buffalo, have decided to strike. The Westmoreland region, on the Pennsylvania Railroad, has been attacked, and the Clearfield and Broad Top regions will be taken next. Strikes there will affect the seaboard coal trade, which has not been touched so far.

Neither side can be said to have gained any advantage this week, and the situation has shown no material change.

ALASKA.

In view of the general interest in Alaska, the General Land Office at Washington publishes a statement as to the land and mineral laws applicable to the Territory. The following laws have been expressly extended to Alaska:

(1) The mineral land laws of the United States; (2) town site laws, which provide for the incorporation of town sites and acquisition of title thereto from the United States government to the town site trustees; (3) the laws providing for trade and manufactures, giving each qualified person 160 acres of land in a square and compact form. The coal land regulations are distinct from the mineral

regulations or laws, and the jurisdiction of neither coal laws nor public land laws extend to Alaska, the Territory being expressly excluded by the laws themselves from their operation. The act approved May 17th, 1884, providing for civil government for Alaska, has this language as to mines and mining privileges:

"The laws of the United States relating to mining claims and rights incidental thereto shall on and after the passage of this act be in full force and effect in said district of Alaska, subject to such regulations as may be made by the Secretary of the Interior, and approved by the President," and "parties who have located mines or mining privileges therein, under the United States laws, applicable to the public domain, or have acquired or improved or exercised acts of ownership over such claims shall not be disturbed therein, but shall be allowed to perfect title by payment so provided for." There is still more general authority.

The patenting of mineral lands in Alaska has been going on, as the cases have come in from time to time, since 1884.

ALASKA-TREADWELL GOLD MINING COMPANY.—Mr. Benj. J. Hall, one of the proprietors of the Pioneer Reduction Works, Grass Valley, Cal., will be in charge of the chlorination works here for the next three months, while Emile Ott takes a vacation.

COOK'S INLET.—All returning miners from Cook's Inlet are dissatisfied. They did no more than clear expenses by their winter's work. Very few of them, however, were experienced miners.

EBNER GOLD MINING COMPANY.—Following along the covered tramway in this mine one enters the lower level of the mine by a tunnel driven straight into the mountain until the ore body is encountered. The fountain is unique. There does not appear to be any well-defined ledge of quartz, but on the contrary a bunch of quartz stringers from 1 in. to 4 ft. wide traverse the range of mountains. There is only one wall visible and against this wall the quartz stringers congregate. This quartz sphere is followed and the material is brought to the surface and sorted. Up the mountain it has been attacked from the front. The face is nearly 100 ft. wide and consists of innumerable quartz stringers so close together that the entire face is mined and worked. A steam drill does most of the work. The excavation is as thick as it is wide and the quartz appears to dip into the mountain. The aggregation of stringers from the level approach made in excavating is solid to the tunnel level below, and will provide the mill of 10 stamps for years to come. The mill is in a substantial building, and contains 10 stamps and four concentrators.

GLADHUGH BAY DISTRICT.—F. C. Lawrence and J. G. Collins have found a 70-ft. ledge, running 880 in gold and 30% copper.

SHEEP CREEK.—A great many of the Sheep Creek miners have got the Yukon fever, and the mines are running short handed. Experienced miners may obtain steady employment at this camp.

WYNDHAM BAY.—The tunnel on this company's property is being pushed ahead rapidly. Stringers of ore are being constantly met with and one fair-sized ledge has been cut. Work will be pushed by the contractors as quickly as possible. They replenished their stock of powder in Sumdum last week and returned to the bay to prosecute their work.

ARKANSAS.

SEBASTIAN COUNTY.

KANSAS & TEXAS COAL MINING COMPANY.—This company has started up its coal mines near Huntington with a full force of miners.

PRAIRIE CREEK COAL MINING COMPANY.—The mines of this company at Huntington are now running, and a large force is at work.

ARIZONA.

PIMA COUNTY.

SAN XAVIER MINING COMPANY.—This company is building an assay office and making other improvements. The water is nearly all pumped out of the 200 ft. shaft and the new hoisting plant will be put up in a few days. Sixty-five cars of ore have been shipped since work was started. Eighty men and 200 mules have been hired. As soon as they get things in shape the managers expect to ship 50 tons of ore per day.

YAVAPAI COUNTY.

A rich strike of cinnabar is reported from Walnut Grove. J. C. Henry, of Phoenix, is said to be the lucky finder, and his report is that the ledge runs very heavy in quicksilver. This news has created almost as much excitement in the neighborhood as though the find were of gold ore, for quicksilver is used in large quantities in this Territory, and all of it is brought from the New Almaden mines in Santa Clara County and from the Johnstown and Knoxville mines in Lake County, Cal.

BUSTER MINE.—Superintendent Treadwell has been running a crosscut tunnel to tap the ledge in this mine, and has succeeded in striking it, as well as an ore body, at a distance of 200 ft. He has cut into the ore body 3 ft. No assays have as yet been made of the ore, but it shows very rich.

WEAVER DISTRICT.—S. E. Fuller, who has been in the Weaver District, says that placer miners are taking out in all between \$2,000 and \$3,000 a month in that district. Fair-sized nuggets, worth from

\$2.50 up to \$5 and \$10, are still found quite frequently, and not long since one was found worth \$200.

CALIFORNIA.

Twenty-three miles of the Sierra Railroad, which is to provide an outlet for the mining sections of Tuolumne, Calaveras, Amador and Mariposa counties into Stockton and the San Joaquin Valley, have been completed and are in actual operation.

As the mining section which will be tapped is almost destitute of timber the advent of the railroad will do much to cheapen the cost of mining operations and will tend to stimulate mining development in the counties through which it will run. At the present time it is an exceedingly difficult and expensive matter to bring timber and other mining supplies into this territory.

AMADOR COUNTY.

(From Our Special Correspondent.)

KRUEGER & VAUGHN.—This property, located about three miles south of Jackson, has been bonded by William Craib, of Oakland, Cal. The old shaft, put down over 45 years ago, is being cleaned out, and sinking will be continued to a greater depth. The ore from this shaft milled from \$7 to \$8 per ton, but this did not pay under the old methods of working.

CALAVERAS COUNTY.

O'NEIL CREEK PLACER MINING COMPANY.—Articles of incorporation have been filed. The headquarters for business purposes will be at San Jose. The life of the corporation is to extend to 50 years. Seven directors have been elected—L. O. McKenney, B. F. Garrison, Robert Summers, E. E. Cumis, Geo. E. Craft, J. M. Ely and James F. Butterfield. The capital stock is 25,000.

EL DORADO COUNTY.

PLACERVILLE.—A rich strike has been made. Thirty-two ounces of coarse gold were shown at Folsom yesterday as a result of three hours' work by one man.

KERN COUNTY.

(From Our Special Correspondent.)

LITTLE BUTTE.—A strike is reported at this Randsburg mine. The vein encountered at the bottom of the shaft is 3 ft. in width, assaying very rich in free gold.

RANDBURG DISTRICT.—The Kinyon mine is producing some good ore. Eight tons sold to the sampling works brought \$4,064.

The Little Philadelphia, an extension of the Butte at Randsburg, has been purchased by Los Angeles parties, who have commenced active development work.

The shaft at the Wedge is down 400 ft. A new hoist is to be put in to enable them to sink to the 1,000 ft. level.

NEVADA COUNTY.

(From Our Special Correspondent.)

MONTANA.—This mine, three miles south of Nevada City, has been pumped out by the lessees, who have repaired the incline shaft, and are taking out good ore.

REWARD.—In the 500-ft. level at this mine a ledge has been cut which averages 9 in. of rich ore, 200 sacks of which is being shipped to the smelter. On the 400-ft. the same class of ore was struck. The shaft is down almost 600 ft., and a station will soon be cut. The mine is one mile southwest of Nevada City.

UNION.—The bedrock tunnel at this drift mine, on Relief Hill, $3\frac{1}{2}$ miles from Bloomfield, is in 2,400 ft. The pay gravel, which contains coarse gold, is from 100 to 200 ft. in width. Thirty men are employed. The claims comprise about 90 acres.

PLUMAS COUNTY.

(From Our Special Correspondent.)

GREEN MOUNTAIN.—The mine is one-half mile west of Crescent Mills. A 30-stamp mill is to be erected, and the mine worked on a large scale. Tunnel No. 6, which is in over a mile, is to be extended 2,000 ft. further.

ROUND VALLEY CONSOLIDATED MINING COMPANY.—This company's property, known as the Arcadian mine, is located on the east side of North Canyon, two miles southeast of Greenville. It contains four claims and a mill site. During the past two years more or less development work has been done, consisting of a main crosscut tunnel 700 ft. to the vein, thence a drift 500 ft. to the north, and the Taylor tunnel, 450 ft. long. A ledge containing fair-grade ore has been developed.

SHASTA COUNTY.

(From Our Special Correspondent.)

THREE SISTERS.—At this mine, in Dutch Gulch, near French Gulch, owned by the Ellery Bros., \$40,000 was taken out some time ago by sinking an 80 ft. shaft and then drifting west on the ore body. The vein pinched out and the mine was shut down for a time. Recently John L. Cannon took a six months' lease and ran a drift east on the vein, finding a ledge of very rich free-milling ore 18 in. in width.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

MORNING STAR.—This mine, together with six other claims containing in all 280 acres, with a frontage of $2\frac{1}{2}$ miles on the Klamath River, all located in the Cottage Grove Mining District, have been purchased by Charles Hutchinson, of Chicago, who

will develop the property on a large scale. Water is to be brought from the Coon and Swellup creeks, TUOLUMNE COUNTY.

(From Our Special Correspondent.)

DUTCH.—At Quartz Mountain drifting continues on the third and fourth levels, and the 20-stamp mill is being run night and day on high-grade ore. Sinking will be resumed in a few weeks.

GOLDEN STAR.—At this pocket mine, near Big Oak Flat, which has been developed by a tunnel, a large body of rich ore has been opened up; \$75,000 is reported to be in sight.

GRIZZLY.—Work at this mine, which is situated one mile southeast of Curtis, is progressing rapidly, the new shaft being down 400 ft. to the bottom of the old works. The vein averages about 6 ft. in width, and mills \$10 per ton free gold. The new hoist ordered some time since is being placed in position.

JUNCTION.—This property is on Yost Ranch, one mile south of Soulsbyville. It has been developed by a 75-ft. shaft, a crosscut and a drift to find the true trend and width of the vein. The result shows a $4\frac{1}{2}$ -ft. ledge of high-grade ore, 12 tons of which milled \$2,400. The management intends to erect a modern plant very soon.

PROVIDENCE.—This mine, on the north fork of the Tuolumne River, 15 miles from Sonora, has been bonded for one year. The shaft is down 140 ft., showing rich ore in the bottom.

RIVERSIDE.—This mine, in American Camp, 11 miles north of Soulsbyville, on the south fork of the Stanislaus River, which has been idle for the past 15 years, has been reopened by San Francisco parties. The 20-stamp mill will be repaired and its capacity doubled.

TRIO.—The three-compartment shaft at this mine, one mile northwest of Jamestown, is down 60 ft. Drifting on the ledge is being pushed.

COLORADO.

BOULDER COUNTY.

MODOC.—Mr. C. W. Betts, the manager, has recently opened a body of ore 220 ft. long in the third level, with more than a foot of smelting ore with from 2 to 3 ft. of mill dirt on the sides. He is sacking about 20 sacks of the smelting ore every day, that will run $3\frac{1}{2}$ oz. gold to the ton, and 15 stamps are pounding out the mill dirt, which runs from \$15 to \$20 to the ton, the concentrates being worth about four ounces.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

ALICE MINING COMPANY.—At the annual meeting of this company, held at Yankee Hill, on Monday, August 1st, the contract for the sale of the property was confirmed, and the mine and mill now pass into the hands of George Crocker for New York people. The consideration is understood to be a quarter of a million dollars.

CURLEW.—The Eastern people operating this group of claims, at Yankee Hill, have begun work for the erection of buildings, and the installation of air compressors for driving a crosscut to reach the more prominent lodes of the groups.

GOLCONDA MINING AND TUNNELING COMPANY.—After a big delay in reorganizing this Buffalo company, work has finally started on the big bore which is to be driven from a point on Fall River to the lodes of North Spring gulch. The group of claims owned by the company will be cut within a distance of half a mile at a depth exceeding 1,000 ft. An air compressor driven with water power supplies the air drills.

JOE REYNOLDS.—This property is at Lawson. It is understood it will be taken out of the hands of the administrator by one of the heirs and be worked on a more extensive scale than under the leasing system. The mine has several miles of drifts and in the shaft at a depth of 900 ft. a big body of silver ore is showing.

ROCKY MOUNTAIN MINING COMPANY.—In the P. T. shaft at Idaho Springs a part of the streak has changed to a native copper, the first of its kind discovered in a Clear Creek mine if not in the State.

SODA CREEK.—Some recent discoveries of gold-bearing quartz in this section of the county have begun to attract attention and a number of prospectors are covering the hills, hoping to find other leads. Those discovered carry lead, copper, gold and silver. An assay from a 12-in. streak of quartz ran 40 oz. gold per ton.

STANDARD MINING COMPANY.—Pennsylvanians recently bought the Miller group of claims, near Idaho Springs on Fall River, and have installed an air compressor with power drills for opening up the nine lodes already encountered in the crosscut. The company is also erecting a mill at the same place for treating the vast bodies of mineral by concentration.

EL PASO COUNTY.

(From Our Special Correspondent.)

COLORADO ORE SAMPLING AND REDUCTION COMPANY.—This company's plant has been sampling ore for the past two weeks, and is now ready to treat oxidized ore by the cyanide process. It is estimated that the roasters will be in working order in about 15 days. The chlorination plant also will soon be running.

GOLD COIN MINING AND LEASING COMPANY.

The enlarging of shaft No. 1 of the Gold Coin mine of this company to one of three compartments will soon be completed, as but 35 ft. remain to be enlarged. The new hoister, which, however, is only temporary, has arrived and will be put in place at once. The vein is in granite and is widening out considerably with depth. At the second, or 228 ft. level, the ore shoots, which near the surface were some distance apart, have come together, making one continuous shoot. The new hoister was purchased from the Mine and Smelter Supply Company, of Denver, and is of 125 H. P. One hundred and twenty men are employed. The mine is a regular shipper and the amount will be materially increased when the new shaft is in working order. It is 320 ft. deep.

GOLD DOLLAR.—A new shaft-house is being built on the lower workings of this property. This shaft is thought to be on the same vein as the Lindsay and other leases, on the Aregua townsite. As soon as connection is made between the upper shaft and the tunnel the hoisting plant will be moved to the new shaft house. The property consists of about 15 acres of ground on Beacon Hill. Regular shipments are made from this property.

EL RENO MINING COMPANY.—This company's property, consisting of about 18 acres of patented land a short distance south of Cripple Creek, is being operated under lease by Moses & Fisher, of Pueblo. The ground is being actively prospected by about 15 sub-lessees. The main shaft, which is about 160 ft. deep, has just been pumped out, and sinking will be commenced again, also drifting along the vein. Some of the leases have a very good showing, and have run into ore. The El Reno, the Comstock, and the World's Fair are the claims owned by this company. Considerable ore has been shipped in the past from this property.

MINERAL HILL.—There is considerable excitement about several reported strikes on the south side of the hill. It lies just north of the town of Cripple Creek, and no ore has yet been shipped from it. There is much prospecting on the hill, but nothing definite can be learned.

MOON-ANCHOR GOLD MINING COMPANY.—The new hoister on this company's property is now in running order, and work is proceeding as usual. The development work is being done on the lower levels. At present the shaft is not being sunk.

RAILWAY CONDUCTORS' MINING AND MILLING COMPANY.—Two sets of lessees are at work on the J. J. L. claim of this company. Considerable work has been done on the Home lode of the same company. The property is on Guyot hill not far from Beacon. No ore has yet been shipped.

ST. THOMAS.—The lessees on this property, adjoining the lease of Dr. Shaw and others, have put up a small hoist and a new ore house.

LAKE COUNTY.

(From Our Special Correspondent.)

The fall in the price of the white metal has caused general alarm here this week, and it means a setback in work that was to be inaugurated unless a few points in price are gained. There are great bodies of low-grade ore in the camp which cannot be worked even at 60c. silver, and there is much more that is barely worked at a profit at that price and this simply because there are other metals associated with it which go to make up a remunerative value. The pumping propositions are, as is well known, very expensive, and even with silver at 60c. there is but a small margin left after paying expenses. In many cases propositions cannot be handled at all at the low prices now ranging. A continued fall in the price of the white metal must therefore necessarily affect many of the silver propositions of the camp, and it is but natural that the fall should be viewed with alarm.

AMY.—Lessees on this property are operating a good body of iron ore and are now shipping regularly from 20 to 30 tons of this ore per day.

CENTURY MINING COMPANY.—This company has just filed with the recorder its certificate of paid-up stock of \$1,000,000.

ELK.—W. T. Harris, Sam Thomas and other lessees who are operating this property will have the same on the regular shipping list at an early day, at which time shipments will be considerably increased. The boys are working on a vein of good lead ore that is opening up nicely and which assays about 50% lead and 33% in silver.

GUNNION.—This property, lying in the Sugar Loaf District, will be extensively operated this month. The owners have been doing prospecting work for some time, and have opened up a vein of good silver and gold which is to be developed and shipped.

LITTLE GIANT.—This property, on Carbonate Hill, operated by Doddridge, F. C. Williams, et al., is being worked at the 500-ft. level, where they are drifting on a small streak of rich lead ore which assays from 50 to 700 oz. silver to the ton and 35 to 60% lead. The lessees have just made a shipment of 30 tons, and are following on the streak with very good indications of opening up a fine ore body.

MONARCH MINING COMPANY.—Articles of incorporation of the new Monarch Mining Company have been filed. The capital is \$1,000,000 and the incorporators are J. W. Henney, of Freeport, Ill.; Wm. A. Miles, Columbus, O., and Chas. L. Thayer. These gentlemen and John C. Kortz and Timothy Goodwin constitute the board of directors of the new company, which is organized for the purpose

of operating the Australian, Virginus, Little Winnie, 1892, and Jessie Clark claims, located on Little Ellen Hill, and now owned by the Australian Mining Company.

MOUNTAIN STAR COMBINATION.—According to papers just filed the Mountain Star, American Eagle, Bull Hill lodes and Bull Hill mill site have just been sold for \$5,000 to J. W. Beam. The properties are located in the Twin Lakes Mining District and it is understood that the new owners are to carry on important work.

PITTSBURG No. 6.—This is doing good work under the management of lessees, who are shipping about 50 tons per day.

SEDALIA.—On June 7th these people started sinking on their shaft from the 700-ft. level, and have sunk it 70 ft., and are now cutting their second station. From his point drifts are being run back to the original ore body. In the meantime shipments are steady, and some 30 tons a day are being hoisted and shipped.

TIGER MINE.—After 18 years of litigation, the Supreme Court has issued a decree in the Tiger mine suit this week. This property lies in the Sugar Loaf District, and is a very valuable silver property. In 1879 Thomas Fisher, a prosperous banker of Memphis, purchased into the Flag property, which was at the upper end of the Tiger. The property yielded well, but just about that time Fisher died, and when Mrs. Fisher came out to settle up the estate a litigation began, and she has never received a cent out of the property. It appears that the American Flag was later relocated as the Tiger by G. M. Seymour and other Minneapolis people, and the case was at once thrown into court. A receiver was appointed, Geo. P. Brown, and he was instructed to lease the property, which he did. Something like \$50,000 was paid to the receiver in royalties, but as the rights of the owners was in litigation none of this money was paid over to any of them, but was invested by the receiver. Now the court decides that Mrs. Fisher is entitled to one-half of the property, and one-half of the royalties that have been paid to the receiver. But while the litigation over the ownership is decided, it seems very probable that more suits will follow, as it is stated that much of the money invested by the receiver cannot be realized upon at this time. The court orders the receiver to turn over all moneys and make settlement by August 15th.

TRIUMPH.—Sinking on this shaft has been commenced, and it is to be put down just as fast as possible, there being three shifts operating on the property.

GEORGIA.

LUMPKIN COUNTY.

PREACHER.—The drift is in 200 ft. and has struck the famous Wallace vein. It is 2 ft. thick and rich.

TAHLONEKA.—The shaft of this mine is down 50 ft. At 80 ft. crosscuts and levels are to be driven.

PAULDING COUNTY.

YORKVILLE GOLD MINING COMPANY.—Application for the appointment of a receiver has been made by J. L. Hudson, Robert McMillan and others, of Detroit, Mich. The applicants are stockholders and claim that they have advanced \$24,000, which has been spent in buying property, leaving nothing to develop the mine and put up a mill. The intention, it is understood, is to reorganize the company.

IDAHO.

BLAINE COUNTY.

CAMAS No. 2.—Vice-president and Treasurer Jerome B. Frank, of the American Cyanide Company; Carl Andersen, a mining and mechanical engineer, and W. H. Wickham, a chemist, have left Hailey to begin operations on the tailings at the Camas No. 2 mine and mill. A plant for the treating of the tailings by the cyanide process is being erected.

CASSIA COUNTY.

(From Our Special Correspondent.)

BLACK PINE MINING COMPANY.—Articles of incorporation were filed July 27th; capitalization \$300,000, shares par \$1; allotment of 50,000 shares is set aside as treasury stock. Annual meeting first Monday in February. It is a Utah company with head office in Salt Lake, where reside the incorporators and officers. John Beck is president, Henry Dinwoodey vice-president, Frank Y. Taylor secretary-treasurer, who with Hyrum Beck and M. W. Taylor compose the directorate. The realty consists of Telluride, Aspen, Lake View, Climax, in the Black Pine Mining District.

WASHAKIE MINING COMPANY.—Articles of incorporation were filed with the Secretary of State, Utah, July 29th. Capitalization \$300,000, shares par \$1, with 100,000 shares set aside as treasury stock. Head office at Salt Lake City; annual meeting first Monday in February. Officers and directors are: Moses W. Taylor, president; H. R. Richards, vice-president; Alex. S. Campbell, secretary-treasurer; O. B. Berglund, Martin Christopherson. The realty consists of the Bullion and Iron Horse claims and also the chloride in Box Elder County, Utah. It is understood that, for the present, the main operations will be on the Cassia County property, on which a 200-ft. tunnel has exposed an ore body, said to carry 25% lead, 12 oz. silver, \$4 gold. Means of concentrating the mineral are under consideration.

IDAHO COUNTY.

BANNER MINE.—Harry Glidden, the manager, writes: "We have struck another streak of good ore that will average 14 in. in width, and alongside of it in the cross-cut 22 ft. below the McLean shaft in the upraise, about 18 in. of decomposed ledge matter. Shots disclosed from 10 in. to 1 ft. more ore of a character similar to the ore above, and very good. The crosscut is in from the footwall between 26 and 28 ft., and the last ore is rich—will run about \$30. We are saving all the stuff across the ledge, and I believe from pan tests it will average at least \$10 across the whole 20 to 28 ft. There is still ore in the face, but I believe the next 5 ft. will give us the hanging wall. I think we shall begin to catch the ledge in the lower crosscut at the bottom of the raise inside of the next 10 or 15 ft."

LATAH COUNTY.

BISHOP.—This mine, in Jerome Creek Camp, has made a strike that is considered by far to be the best-looking rock yet discovered there. The ore runs very high in copper and silver with a showing of free gold that, it is estimated, will go from \$60 to \$120 per ton. The find was made in the shaft at a depth of 58 ft., and is growing better as the work progresses. The lead is between 3 and 4 ft. wide, with strong indications of its widening very fast. The Bishop is the north extension to the Gold Bug and the two companies propose drifting both north and south from the 100-ft. level and taking the ore from both mines out of the Bishop shaft, which is only 60 ft. from the dividing line.

DAISY.—This mine recently made its second clean-up. The first was satisfactory, but the second was reported much better than was even hoped for. The exact figures have not been given out yet.

EARLY BIRD.—The manager reports a favorable return from the ore milled as a test.

SHOSHONE COUNTY.

PIERCE DISTRICT.—Reports from this district are of the most encouraging nature, according to local papers. Word reaches us that another promising strike has been made on a ledge which measures about 2 ft. in width and panned \$200 to the ton. The strike, coming so soon after the recent rich strike made on the Mussellshell and in the French Creek District, has created enthusiasm for the camp's future. A noticeable feature of the recent discovery of the ledges is that they have been found in the vicinity of rich placer diggings, and as a result prospectors and miners are turning their attention toward the old diggings which made the camp famous in the '60s, to look for ledges.

ILLINOIS.

FLUOR-SPAR COMPANY.—This company informs us that it has opened up three mines in Hardin and Pope counties, owing to an increased demand for fluorspar. Among the largest consumers of this mineral are the smelting and steel furnaces, the steel foundries and the chemical and glass works. The company's headquarters are at St. Louis, Mo.

INDIANA.

MADISON COUNTY.

STANDARD OIL COMPANY.—This company, on August 1st, is said to have developed the record-breaking natural well of the Indiana field, running 600 bbls., or \$275 a day, with every indication that the flow will be steady. The only unleased land, 80 acres, lying near, commanded a cash bonus of \$1,000. According to our informant the Standard will build a pipe line into the field.

KANSAS.

CHEROKEE COUNTY.

(From Our Special Correspondent.)

BEN BUTLER MINING COMPANY.—On the De Graff Brothers' lease they are drifting at 115 ft. on a good run of lead ore in open ground. They clean up the ore on hand jigs, and are producing 42,000 lbs. of lead ore weekly.

CONSOLIDATED COMPANY.—They were hoisting zinc ore from the 115 ft. level, when the water came up in their drifts and they came up to 70 ft. where there was a small streak of lead ore, and commenced to drift, and now they are producing 45,000 pounds of lead ore weekly.

E. C. HUFF.—One of the best paying mines in the camp is owned by E. C. Huff, of Erie, Pa., and is located on the Ruby lease. He and his brother, A. L. Huff, selected the lot and made the contract for sinking a shaft. At 28 ft. chunks of lead ore weighing 25 lbs. began to be taken out, and the dirt to increase in richness the deeper they went. The shaft was sunk to 53 ft. in rich lead and zinc dirt, and has good dirt in the bottom. The shaft cost Mr. Huff \$120 for sinking, and he sold \$198 worth of ore. A drift was started at 40 ft. and the mine is already making Mr. Huff \$650 per week, clear profit. The output this week will be 20 tons of free zinc ore, 18,000 pounds of lead ore and 40 tons of crush ore.

GEO. McCULLAGH LEASE.—On this lease of the Williams land there are seven producing shafts that are making an output of ore every week. They are working on the 90-ft. level. Last week in sinking the pump shaft deeper they opened up a large body of zinc ore at 100 ft.

LARABEE & SONS.—This week they will put in a large double Wonder pump in the pump shaft on the Windsor land, and this will drain the ground to 130 ft. They will sink another pump to 150 ft. and put in a second Wonder pump, and these two will

drain the ground to 150 ft. where there is a large body of zinc ore. There are 20 prospect shafts going down on the land, and seven of them are taking out pay dirt. On the Houghney land they have the ground drained to 76 feet, and 10 shafts are producing pay dirt. They are lowering the water with Chinese pumps.

MASTIN & KIRBY COMPANIES.—These have at last lapped the heavy body of water on the Mastin tract. The water began to come into the pump shaft very lively last Wednesday, and the pumping capacity will have to be increased to handle it. The work of sinking the pump shaft to 150 ft. and drifting out to the open ground has been very expensive, having cost the two companies \$20,000, including the pumping plant, but if they have succeeded in tapping the water they will be fully repaid for the expense as there will be no more drown-outs on these companies' lands, and the ground can be mined to a much lower depth than before.

ORONOGO MINING COMPANY.—The company put an 8-in. lift pump in one of its shafts, and has the ground drained, and is drifting out 95 ft. on large bench of zinc ore in open ground. The plant is producing 40 tons of zinc ore weekly.

PUMP SHAFT COMPANY.—On the DeGraff Brothers lease the company sunk their shaft to 165 ft. and developed a large body of zinc ore and built a fine large concentrating plant. They are hoisting pay dirt from two shafts and are producing 100 tons of zinc ore and 18,000 lbs. of lead ore weekly. They only have just enough water to run the plant.

ROWE, MOORE & COMPANY.—Sam Rowe, of Joplin, is interested with Geo. Moore and Alba Stough in a rich prospect on the Maggie Taylor land. It promises to be a big producer. They put a 6-in. pump in an old shaft that had been worked in the upper ground for lead ore 12 years ago; drained it to 60 ft., and have developed an 8-in. vein of solid lead ore underlain by 8 ft. fine zinc ore bearing ground.

MICHIGAN. COPPER.

ARNOLD.—The present workings are on the ash-bed belt, which crosses the property from west to east. It is also crossed by numerous fissure veins, which run at about a right angle to the ash-bed. No. 1 shaft, which is sinking on the ash-bed, is now down about 625 ft., or below the sixth level, which is just being started both east and west. The character of the lode is good and the last 100 ft. sunk has certainly been the banner lift. Superintendent Clark estimated that the stock pits contain about 25,000 tons of rock, much of which is quite rich. It is intended to start another shaft some 1,200 ft. west of No. 1 at an early date.

QUINCY MINING COMPANY.—This company reports the output of its mine for July at 851½ tons copper.

WOLVERINE COPPER MINING COMPANY.—At the annual meeting, held in New York, August 2d, the old directors and officers were re-elected, Mr. John Stanton being president; J. R. Stanton, secretary and treasurer.

IRON—GOGEBIC RANGE.

TILDEN MINE.—The Tilden has closed down, throwing 250 men out of work. The reason is that sales have been slow. The mine is a Rockefeller property.

IRON—MARQUETTE RANGE.

SALISBURY.—The Cleveland-Cliffs Company has begun to make some necessary improvements at the Salisbury mine. The most important will be the removal of the engine-house and plant from its present location to a point immediately east of the old pit. The plant will be only a short distance from the shaft, with plenty of room for shaft house, trestles, etc. It is expected that the shaft will be completed about the first of the year. It is the wish of the management to have the new place fitted up by that time, so that the hoisting can be done with the big plant immediately after the shaft-house is finished and the tracks in the shaft are completed. With the new shaft in operation the Salisbury will be much better equipped than ever before. Its output can be increased considerably, and if necessary a much larger force than is at present employed can be put on. They also expect to have better air underground.

MINNESOTA.

(From Our Special Correspondent.)

Shipments of ore from Minnesota this year to date are about 300,000 tons ahead of the same time last year, the increase coming from the mines of the Minnesota Iron Company and the Mahoning, there having been a falling off of about 100,000 tons from the line of the Duluth, Missabe & Northern, because of the floods early in July. Total shipments have been 2,650,000 tons, of which the Duluth & Iron Range has handled 1,260,000 tons; the Duluth, Superior & Western, all from the Mahoning mine, about 300,000 tons, and the Rockefeller road, 1,100,000 tons. Of the latter very much more than half came from the mines of the Carnegie syndicate. Shipments are proceeding with great rapidity and August is likely to see a larger movement than July. The Duluth & Iron Range road sent down in July 525,000 tons, and on one day its receipts were 1,038 carloads of 26 tons each. Freight rates are still at a low point, 50c., and the loss of upbound coal has had some effect in tying up a few vessels. The Duluth, Missabe & Northern road has leased

400 ore cars from the Wisconsin Central line and is now operating 2,200 cars. Its shipments will be increased in consequence.

Rivalry for cargo records at the docks at Two Harbors, Duluth & Iron Range road, has led to some enormous loads the past week, the *Maricopa*, *Crescent City* and *Carnegie* having taken out 5,400, 5,386 and 5,300 gross tons respectively. These loads made a total of 18,075 tons net, for three boats, an unprecedented quantity.

There is some shortage of miners on the Minnesota ranges because of the number who have gone to the harvest fields and those who have taken the Alaska fever. It will be but a few days, however, before there will be plenty of men.

ITASCA COUNTY.

OLIVE.—This proposition, on Little Turtle Lake, is already making a good showing. The ore dump is growing rapidly and the mill is to begin operations on August 15th. Hoisting and pump machinery is now on the ground. Two shafts are being sunk. The mine saws all its own lumber.

RANDOLPH.—The main shaft is now down 75 ft.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

COMMODORE MINING COMPANY.—Work at this mine is carried on with about 100 men, and No. 3 shaft, which is some little way from the ore body, is being cut to it through very hard rock. It is supposed mining operations will continue during the winter. About 400 tons a day are being hoisted.

FRANKLIN MINING COMPANY.—It is rumored that the three mines operated by this company under fee and lease will pass into the control of the J. D. Rockefeller interest, they now being in the hands of Franklin Rockefeller and Corrigan, McKinney & Company. The truth of the rumor cannot be learned here.

MAHONING ORE COMPANY.—This company has let another heavy stripping contract to Winston & Dear, by which that firm will maintain its present force at the mine another year. The mine is shipping about 5,000 tons a day now.

OLIVER MINING COMPANY.—Shipments from this property for the season to August are 350,000 gross tons.

PENOBSCOT IRON COMPANY.—This new company, after a year's work, has its fine mine at Hibbing ready for shipment and is hoisting ore. The mine has a good many labor-saving devices that are a little the nicest things of their kind on the range.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

MINNESOTA IRON COMPANY.—This company's mines at Tower and Ely are loading about 400 cars of ore daily for the docks, making a total of 13,000 tons going forward from the range.

WALSH MINES.—Thomas Walsh, of Duluth, who has just closed a five-year contest with the Minnesota Iron Company for the title to valuable mineral properties near Tower, is now leasing them to an Eastern syndicate which proposes mining on a large scale, if terms can be agreed on. A rich vein of hard ore has been found to run a half mile through the property.

ZENITH MINING COMPANY.—It is rumored that this company is to pass into the possession of the J. D. Rockefeller interests, but no confirmation of the report can be had.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The weather during the past week was good for mining operations and the output of ore was a little larger than the preceding week. The sales were an increase of four carloads of zinc ore and eight carloads of lead ore over the previous week, and compared with the corresponding week of 1896 it was a gain of 14 cars of zinc ore and eight cars of lead ore. There is very little surplus zinc ore and the surplus lead ore was reduced to 1,000,000 lbs. The top price paid for zinc ore was \$22 per ton, practically the same as last week, when \$2 was top price for all except four carloads. Fifteen cars of Joplin ore, 18 of Webb City and Carterville ore, the Oronogo, Alba, Carthage and Stott City products sold at \$22 per ton. The average price was fully as strong as during the preceding week.

Lead ore sold at various prices during the week; 21 cars selling at \$23 per thousand in the bin—purchased by the agents of the Argentine smelter. The Picher Lead Company quoted the price at \$23.25 per thousand pounds all the week, and \$24 was paid for some lead ore in the bins at Carterville. There was an uncertainty about the price all the week, and while the price was apparently strong a wavering tendency indicates a possible drop in the price to adjust it to St. Louis quotations of pig lead. The corresponding week of last year a few choice lots of zinc ore sold at \$22.50, but the ruling price was \$21.50 per ton. Lead ore sold all the week at \$15.50 per thousand pounds, or \$7.50 less than it is now bringing.

Following are the sales of lead and zinc ores for the week ending July 31st, 1897: Joplin zinc, 1,155,030 lbs.; lead, 221,430 lbs.; value, \$17,900. Carterville zinc, 1,320,060 lbs.; lead, 465,800 lbs.; value, \$24,150. Webb City zinc, 501,000 lbs.; lead, 58,860 lbs.; value, \$6,391. Galena zinc, 2,560,000 lbs.; lead, 448,180 lbs.; value, \$33,460. Aurora zinc, 720,000 lbs.;

lead, 20,000 lbs.; value, \$5,465. Alba zinc, 126,000 lbs.; value, \$1,386. Stott City zinc, 116,780 lbs.; value, \$1,285. Carthage zinc, 109,110 lbs.; lead, 2,090 lbs.; value, \$1,248. Oronogo zinc, 84,820 lbs.; lead, 4,860 lbs.; value, \$1,030. Belleville zinc, 22,300 lbs.; lead, 7,150 lbs.; value, \$399. District totals for last week: Zinc, 6,715,160 lbs.; lead, 1,228,280 lbs.; value, \$92,723. District totals for 30 weeks: Zinc, 194,869,360 lbs.; lead, 33,339,780 lbs.; value, \$2,485,628.

BUDD IRWIN COMPANY.—They are working in the cavern of the Blue Belle mine on the Chatham lease, and have put in an incline of which one end is 60 ft. below the surface. Last Friday two shots broke enough dirt to make 4 tons of zinc ore. They have opened up a large face of ore and will make a good turn-in.

DERING, KELLY & COMPANY.—This firm, on the Roaring Springs land, is drifting at 75 ft. on large face of zinc ore in open ground with hardly enough water to wash the ore. With five men employed it is producing 10 tons of free zinc ore, and 30 tons of crush ore weekly.

EDYTH MINING COMPANY.—This company, on the old Orchard lease, is taking out rich dirt that will pay for the sinking of the shaft. They struck pay dirt at 118 ft., and went through 12 ft. of very rich zinc ore, and, as they have good ore in the bottom of the shaft, will sink through the ore before commencing to drift. This is one of the best strikes made on the lease so far.

JACKSON MINING COMPANY.—This company, on the Jackson land, has one of the richest looking prospects in Chitwood Hollow. The dirt that is being hoisted is very rich, and there seems to be a large body of it. In sinking they went through 24 ft. of very rich ore-bearing ground, and in drifting the face is getting larger. A contract has just been let for a complete concentrating plant of 100 tons capacity every shift, to be finished in 45 days. Next week operations will be stopped to put in a new boiler and as soon as it is in place they will start to drift so that they will have lots of dirt to hoist when the plant is finished.

SOUTH JOPLIN LEAD AND ZINC COMPANY.—This company owns 40 acres of land in the southwest part of the city of Joplin, on which has been built a good concentrating plant. This company is hoisting pay dirt from two shafts and will sink another. This week men will start to drift in the fourth on a good face of ore. They have been working this land since 1899, and have made a good output of ore nearly every week since that time, and have only developed five acres. They run drifts at 75, 90, 120 and 155 ft., and have taken out ore in paying quantities from each. They employ 20 men and make from 25 to 35 tons of zinc ore, and from 5,000 to 8,000 lbs. of lead weekly.

MONTANA.

GRANITE COUNTY.

HOPE MINING COMPANY OF ST. LOUIS.—This company paid on August 1st a dividend of 10c. per share, amounting to \$10,000. This makes a total of \$70,000 paid in dividends thus far in 1897 and a total of \$702,252 paid by the company up to date.

JEFFERSON COUNTY.

YORK DISTRICT.—Large bodies of low-grade ore are being discovered and as they are thought to be singularly well adapted to the conditions of cyanide treatment, that process is likely to take the place of the mills. The ores run from \$4 to \$20 to the ton.

LEWIS & CLARKE COUNTY.

MONTANA MINING COMPANY.—This company's new cyanide plant has been started up working on the accumulated tailings. The plant is complete in equipment and is the largest in the State, having a capacity of from 400 to 500 tons a day. A part of the equipment consists of a narrow-gauge railway extending from the plant to the lower dam from which the tailings will first be worked. There are sufficient tailings to run the plant at its present capacity for about 10 years. A force of nearly 40 men is employed at the plant. A large amount of dirt may be handled with comparatively little expense, owing to the complete arrangements at the big vats where the process is carried out.

PARK COUNTY.

BUTTE & YELLOWSTONE COAL AND COKE COMPANY.—A. O. Newton is to be the new manager for the Butte & Yellowstone Coal and Coke Company. The company is capitalized for \$50,000, with H. L. Frank, of Butte, as president. The company will erect 21 ovens, and by December it is expected coke will be burning and shipments made to Butte. There has already been erected a 50-ton bunker at the foot of the mountain, where the ovens will be built, and to which point a 3,000-ft. spur will be laid from the terminus of the Park branch at Cinnabar.

SILVER BOW COUNTY.

A conclusion has been reached in the disagreement between the Montana Ore Purchasing Company and the Boston & Montana Company. The Ore Purchasing Company having the right to use certain property for the purpose of a dam and pond, attempted to build ditches from the same to its smelter. The Boston & Montana people tore up the flumes and filled the ditches, claiming their rights had been invaded, whereupon the Ore Company secured a temporary order from the court restraining them from further interference. Then the Boston & Montana Company secured a writ

preventing the Ore Purchasing Company from doing any further work on the premises until the rights of the respective contestants were determined in the courts. The decision of the court now holds that the right to store water carries with it the right to pipe it away, so long as the property over which the flumes or pipes pass is not injured. Judge Lindsay's opinion is one of interest to mining men generally, who are affected by water rights, and is as follows: "From the testimony introduced at the hearing upon the motion to dissolve the injunction heretofore issued, it appears to the court that the invasion of the alleged rights of the plaintiff will not result in serious injury to its property, and that such injury, if any, as has ensued can be adequately compensated in damages, and it being furthermore admitted that the premises upon which a ditch was being constructed by the defendant is barren and of no immediate use and of little material value to the plaintiff it would seem that no permanent injury to the soil can result. By the lease under which the Montana Ore Purchasing Company, the grantee therein, is given the right to flood and store water upon the portion of the premises of the plaintiff therein designated, the latter company is not restricted with regard to the construction of ditches, by means of which it may store such water; as a matter of fact, nothing is written in the lease concerning the construction of any ditches, but, so long as the right to store water is granted that certainly carries with it, as an incident, the right to the construction of ditches, by means of which it may store such water; as a matter of fact, nothing is written in the lease concerning the construction of any ditches, but, so long as the right to store water is granted, that certainly carries with it, as an incident, the right to the construction of such dams and ditches as may be necessary to an attainment of the primary object of the lease, and so long as the defendant in pursuance of what seems to be its right restricts itself to the exercise of its easement upon the property described in said lease, the plaintiff cannot complain. The court will not at this time endeavor to construe the lease under which the defendant claims, although it is manifest that the Montana Ore Purchasing Company has not exceeded its rights thereunder; the Butte & Boston Consolidated Mining Company is not using the ground in controversy and evidently has no present use for it, and if the court undertook to refuse to dissolve the temporary injunction such action would unquestionably result in much more injury to the defendant than to the plaintiff."

(From Our Special Correspondent.)

In all the big copper-silver properties preparations are in progress to mine on a large scale at depths below the 2,000-ft. level. Hoisting engines run by air, capable of hoisting 1,000 ft., are in place on the bottom levels of some of the principal mines, while on the surface larger hoists are displacing powerful engines. Steam plants are increased, higher head frames erected, etc.

ALICE GOLD AND SILVER MINING COMPANY.—This company has been operating its mines and mill at Walkerville continuously, and for the last two years has earned dividends, with silver at a very low price. It also expected to declare a dividend of \$20,000 the 1st of August (the second year), but in view of the extremely low price of silver it is doubtful whether the money will be divided among the shareholders or left in the treasury. At the mines considerable improvements are in progress. At the Valdimere the shaft has been timbered 120 ft. preparatory to sinking it 300 ft. deeper. At the mills the boiler power has been increased and the plant throughout put in first-class condition for a long run; but, with silver at 57c. an ounce, it is probable that the mill will be shut down and the mine work limited to what is barely necessary to keep it in good condition and carry on the improvements already commenced. Several of the employees are already paid off.

ALEX. SCOTT.—This mine, operated under lease and bond, has an 18-ft. vein, with irregular streaks of high-grade copper-silver ore assaying 60% copper and 120 oz. silver. The shaft is down 500 ft., and will be sunk 200 ft. more.

ANACONDA COPPER MINING COMPANY.—A steel head frame, to be 120 ft. high, is almost completed at the St. Lawrence, and five 100-H. P. Berry safety boilers are ready for duty.

ANACONDA COPPER MINING COMPANY.—A fire in the hoisting works of this mine on July 27th did some trifling damage, but had not the Anaconda employees shown great activity and determination much valuable machinery must have been lost and a long shut-down would then have ensued.

BIG BONANZA.—Sinking below the 100-ft. is in progress. The ore is about 18 in. wide and will assay 150 oz. silver.

BOSTON & MONTANA CONSOLIDATED MINING COMPANY.—At the Mountain View mine sinking below the 1,200-ft. level will commence August 1st. At the West Colusa new boilers will be put in with an iron smokestack 8 ft. in diameter.

BOSTON & MONTANA CONSOLIDATED MINING COMPANY.—About 3 a. m., August 1st, this company's ore chute, located at the Leonard shaft, was found to be on fire. The flames spread rapidly to an adjoining ore chute, but owing to the prompt action of the employees the fire was confined to the ore bins, which were completely destroyed. In addition to the actual loss, amounting to some thou-

sands of dollars, the company will be put to considerable expense in handling the quantity of ore (about 500 tons daily) which was loaded from these chutes into the railroad cars. The origin of the fire is unknown. This is the third mine fire in this county in less than a week, the Clinton hoist having been destroyed by fire July 28th. This fire is supposed to be of incendiary origin. Fire broke out in the roof of the Anaconda shaft-house July 27th, but was speedily extinguished and the damage done was slight.

BUTTE & BOSTON CONSOLIDATED MINING COMPANY.—At the East Gray Rock a new air compressor is partly in place. The 1,400-ft. station is being enlarged to hold a hoisting engine to sink with.

COLORADO SMELTING AND MINING COMPANY.—At the Betsy Dahl, which this company is working under bond, development work is still in progress. At the Gagnon mine, which is located within 500 ft. of the county courthouse, some inconvenience has been caused by the lack of dump room. At present a powerful hoisting engine is on the ground to haul the waste on surface to a suitable dumping ground.

MONTANA ORE PURCHASING COMPANY.—It is stated that this company has secured a lease on the Cambers, Henry George and Westlake mines on Gaylord street.

PARROT COPPER MINING COMPANY.—This company has shut down the Moscow mine, and hauled the machinery to the Little Minah mine. At the Gaylord smelter appearances indicate that it will not be ready for operation this year.

NEVADA.

LANDER COUNTY.

(From Our Special Correspondent.)

AUSTIN COAL MINES.—The only coal mines worked within the limits of Nevada are those of the Austin Mining Company, 18 miles southeast of Battle Mountain. A 7-ft. seam of semi-bituminous coal of splendid quality has been sunk upon 300 ft. on the dip. The company has just erected a steam hoisting and pumping plant, and will proceed with development.

OLD BATTLE MOUNTAIN MINING COMPANY.—The property of this old English concern, which suspended operations in 1883, passed to John Jory, of Copper Canyon, who purchased it for the exterior machinery and appurtenances. Six months ago J. H. Clive, James Johnston and M. H. Browning, of Salt Lake, obtained a lease and bond on three patented claims, Virgin, Marie Louise and Mountain Rock, intending to work the dumps containing many thousand tons of 7% to 19% copper ore. An examination of the shaft of the Virgin, 500 ft. deep, showed old stopes filled with copper ore that is of high enough grade to pay in these days. The old company had hand jigs and shipped over 5,000 tons native copper to Swansea, the cost of haul to Battle Mountain, 18 miles, being \$6 per ton. Tailings from their operations assay 8% copper. The lessees have located 17 claims adjoining, and in one of these, the Lake Superior, native copper was discovered 37 ft. from the surface, and continued, mixed with azurite, bornite and green carbonates to 133 ft. The vein appears to be between quartzite walls, filling being porphyry with occasional masses of quartz. Copper is mixed with porphyry, and native is usually in a conglomerate, or cement of porphyry, though fine specimens, octahedral in form, frequently occur. A steam hoist is to be erected and old stopes to be reopened. Two shipments have already been made of assorted ore from dumps.

NYE COUNTY.

RESCUE.—Work has been suspended in this mine. Three successive managers have failed to make this mine pay, although the ore is said to be fairly good grade and to exist in abundance.

STOREY COUNTY.

AMERICAN FLAT DRAINAGE AND DEVELOPMENT COMPANY.—The San Francisco Report says: "The failure of the Comstock Tunnel Company to take up the company's proposition to extend the Suro Tunnel into American Flat has turned the attention of the latter to Silver City and Dayton as feasible localities from which to run a drainage tunnel. It is, therefore, now contemplating tunneling from one of these places. Members of the Flat Company and Silver City and Dayton mine owners held a conference recently to devise means looking to the construction of a drainage tunnel from either Silver or Dayton to American Flat, in which these parties and others should be jointly interested. The conference resulted hopefully, and the claim owners of Silver and Dayton along the route of the proposed tunnel will meet again to discuss the proposition submitted to them by the Flat Company, which is substantially the same as that proposed to American Flat claim owners."

STOREY COUNTY—BRUNSWICK LODGE.

CHOLLAR MINING COMPANY.—The latest weekly official letter says that shaft No. 1 has been sunk 11 ft. on the incline; total depth, 1,003 ft. The bottom is in porphyry. On the 300-ft. level the stopes on and above this level are looking about the same as at last report. On the 400-ft. level the winze started on this level has been sunk 7 ft. The bottom is all in quartz, some of which is being saved for pay. There is no change in the appearance of the stopes from the upraise. On the 500-ft. level advanced No. 2 crosscut west 17 ft.; total length, 67 ft. The face of this crosscut is yet in

quartz, giving low assays. Advanced No. 3 west crosscut 22 ft.; total length, 38 ft. The face is all in low-grade quartz. The winze has been sunk 10 ft.; total depth, 56 ft. The bottom is all in quartz of low grade. On the 600-ft. level have advanced the main south drift 35 ft.; total length from north line, 203 ft. The face is in quartz and porphyry. Are doing considerable repairing throughout the mine. Have extracted and shipped to the Nevada mill during the week 189 tons of ore, assaying as follows: Top-car sample, gold, \$15.89; silver, 17.03 fine ounces; wagon sample, gold, \$17.59; silver, 18.67 fine ounces; battery sample, gold, \$17.28; silver, 17.24 fine ounces.

STOREY COUNTY—COMSTOCK LODGE.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—The latest weekly official letter says that on the 1,000 level, west crosscut No. 1 started from the north drift from the Consolidated Virginia shaft on this level, at a point 200 ft. north from the station, has been advanced 35 ft., passing through softer porphyry showing clay seams mixed with quartz; total length, 484 ft. On the 1,550 level the south drift started from the double compartment incline upraise No. 1, at a point 178 ft. on the slope above this level, has been extended 18 ft., passing through porphyry, clay and quartz; total length, 27 ft. From this south drift 10 ft. south of the incline an east drift has been started and advanced 25 ft., passing through porphyry and clay with lines of quartz. 1,650 level, from the ninth floor south drift, at a point 265 ft. in from its mouth, the upraise was carried up 109 ft.; during the week advanced 7 ft., passing through quartz assaying 70c. per ton. From incline upraise No. 1, at a point 60 ft. above the sill floor of this level, from near the end of the north drift, the upraise has been carried up on the footwall 10 ft., passing through porphyry and clay; total length, 109 ft. From the end of the north drift 42 ft. in from No. 2 upraise on the sill floor of this level we have worked upward 7 ft., passing through quartz and streaks of ore, from which we have saved 31 tons of ore assaying, per mine car samples, \$37.17 per ton; total height, 23 ft. The total extraction of ore for the week amounted to 31 tons, the average assay value of which, per samples taken from the cars when raised to the surface, was \$34.49 per ton.

SIERRA NEVADA MINING COMPANY.—Late news is that a vein of ore assaying as high as \$40 to \$50 per ton in gold has been unexpectedly found in east crosscut No. 5, started from the northeast drift at a point 444 ft. north from the Layton tunnel. The crosscut was into the ore about 8 ft. and samples gave the above assays. On the Comstock the new discovery is regarded as important, not only because it is gold ore, but as it occurs in a large area of unexplored ground. The Layton tunnel, from which the northerly and easterly openings were made, penetrates Cedar Hill just above the Geiger grade road, on the eastern slope of that eminence. Cedar Hill has been noted for its veins and deposits of gold-bearing ore in past years. The new discovery was not expected, as attention was being paid chiefly to west crosscut No. 3 on the 900 level of the mine, which is being run to tap a promising vein of ledge matter giving assays of from \$1 to \$3 per ton in gold, which was opened by west crosscuts 1 and 2 some time ago.

NEW YORK.

ROCKLAND COUNTY.

ROCKLAND LAKE TRAP ROCK COMPANY.—This company has been organized to quarry trap rock at Rockland Lake and prepare it for market. The directors are Jacob E. Conklin, James C. Conklin and Wilson P. Foss, all of Haverstraw.

OREGON.

BAKER COUNTY.

BONANZA.—A writ of injunction has been granted by Judge Prather, of the Spokane Superior Court, prohibiting further proceedings in the sale of the Bonanza mining properties, near Baker City. The property had been sold for \$750,000. The action in the court is brought by Thomas C. Griffiths and W. J. Thayer, attorneys for C. W. Brawner, and against H. L. Phillips, O. A. Moeglich and others.

PENNSYLVANIA.

ANTHRACITE COAL.

CONTINENTAL MINE.—The Lehigh Valley Coal Company has decided to reopen the old Continental mine at North Ashland, which was abandoned several years ago. Thos. Reese, assistant foreman at Centralia colliery, has been appointed foreman and he has a large force of men at work retimbering and getting the mine in workable shape.

SOUTH DAKOTA.

LAWRENCE COUNTY.

CROOK CITY CYANIDE PLANT.—William Ridell has recently put in a leaching process at Crook City, with which he proposes to treat the tailings that have accumulated at the old mill dam just above the old town by the cyanide process. He has built four storage tanks, each having a capacity of 30 tons. A tank is loaded every day. Mr. Ridell has been having trouble with his tanks, and has lost one or two heavy loads by the cement in the bottom of the tanks giving way. He has remedied this at last and hopes to have everything in good working order again soon. Fred Mosher, of the assaying firm of Joy & Mosher, of this city, is staying at Crook City and is doing the assaying for Mr. Ridell.

DEADWOOD ASSAY OFFICE.—Mr. P. J. Minter, of Chicago, who has been appointed assayer in charge of the proposed United States assay office at Deadwood, has arrived there. He states that the appropriation of \$20,000 for the assay office made by Congress last winter is available, though part of it has been used. With this it is intended to equip the plant and subsequently secure an appropriation for its maintenance. It will be a complete concern in every sense, and only men whose ability and responsibility have been demonstrated will be employed. The office will receive bullion, refine it and pay the owner in currency, the bullion value less transportation charges and expenses. Assaying will be done at commercial rates; in fact the institution will be conducted just as all other government offices are. Mr. Minter hopes to get it in operation this season before snow flies.

MAY.—During the last two weeks the new three-compartment shaft in the claim known as the May, a part of the Hoodoo group, at Galena, has been put down to a depth of 60 ft., which is the fastest work of which any note has ever been made in the Black Hills. That is a little less than $4\frac{1}{2}$ ft. a day in the hardest kind of rock. As the shaft is built of two compartments, or more properly two compartments and a man way, and is 6×16 ft. surface, the miners have removed 5,760 cu. ft. in 14 days. In addition to this the shaft has been timbered all the way down. Three shifts of men have accomplished this, but they have been handicapped in hoisting, having only an ordinary whim instead of a steam plant. A steam hoist has been purchased. The purpose of this shaft is to penetrate this formation and reach the contact of the two ore veins that have been followed with inclines.

It is calculated that they will come together at the depth of about 200 ft. The company proposes to sink this shaft to the depth of 1,000 ft. or at least the hoisting apparatus has been purchased with that end in view. Most of the ore in the two veins, as far as they have been explored with inclines, is said to average \$25 per ton, free milling and concentrates. The company is continuing its mill construction uninterruptedly at both Galena and Edgemont. The former is to be the 120-stamp mill, for which the machinery has begun to arrive at Pluma; the other is a 400-ton smelter, for which the machinery is all on the ground at Edgemont. The machinery will be able to handle 200 tons of ore daily. The company expects to have the smelter shipshape and ready for business by the time winter sets in.

TENNESSEE.

CARTER COUNTY.

STONE CREEK.—Mr. John N. Adams, mining and civil engineer, of Philadelphia, Pa., came here a few weeks ago to develop some copper fields, and not succeeding in finding copper, his attention was directed to other possible resources of profit. He was rewarded by finding a rich vein of iron pyrites.

Mr. Adams now has a considerable force of hands at work mining it, and grading a railroad track for bringing the ore from the quarry to a point where it is transported at present by teams to railway for shipment. At an early date he will largely increase his operating force to at least 500 men, with a weekly expenditure of \$10,000. A railway connecting with both the Southern and Norfolk & Western is now under project and will be constructed just as early as possible. He is said to have orders now from South Carolina, Virginia and Georgia mills for a total of 350,000 tons annually.

UTAH.

(From Our Special Correspondent.)

GENERAL MINING SITUATION.—Utah is a prolific silver-lead region, five out of six of the foremost districts being large producers of these ores; therefore any change in the ruling price of those metals is immediately felt in local business circles. The recent silver drop is probably a harder blow to Utah than to any other State, but it is in a measure compensated for by the rise in lead—fully so for a number of mines.

While the ore reserves in the leading districts show greater bodies of mineral month by month than in 1896, the tonnage for the corresponding current months is less. It would be overwhelmingly disheartening were it true that the mines are nearing the end of their production, and although happily this is not the case the danger line of vanishing profits is to-day very close for many a dry silver property. As the yield of silver and lead falls away gold is certain to show a substantial increase, and copper ore long can be counted on to follow in the wake of the nobler metal. While temporarily under a cloud Utah's mining future is assured, and, in comparison, its past is of small moment.

SHIPMENTS FROM SALT LAKE.—During the week ending July 24th there were shipped East 33 cars, or 1,211,493 lbs., lead-silver bullion; 1 car, or 41,023 lbs., copper bullion; 62 cars, or 1,362 $\frac{1}{2}$ tons, lead-silver ore, and during week ending July 31st 28 cars, or 1,020,362 lbs., lead-silver bullion; 1 car, or 47,442 lbs., copper bullion; 27 cars, or 591 tons, lead-silver ore. Shipments East for July were 147 cars, or 5,557,159 lbs., lead silver bullion; 4 cars, or 181,855 lbs., copper bullion; 193 cars, or 3,860 $\frac{1}{2}$ tons, lead-silver ore.

BEAVER COUNTY.

(From Our Special Correspondent.)

CACTUS MINING COMPANY.—The annual meeting, scheduled for July 31st, at the office of the company in Salt Lake, did not take place. It stands postponed to August 14th.

HORN SILVER.—For seven days in July, mine and mill were closed to allow the men to attend the Pioneer Jubilee. The present force consists of 125 at mine and 35 at mill. Shipments during July were made up of 800 tons of concentrates, from about 3,000 tons of mineral, and 400 tons smelting ore. There is no indication of any changes being contemplated. Manager Farnsworth intimates that if silver holds about at the closing July quotation, the mine can still do fairly well.

JUAB COUNTY.

(From Our Special Correspondent.)

EMERALD.—A report is passed about, of a valuable find on the 400-ft. level, of which no definite particulars are to be had. Color is given to the story by the sudden demand for the shares among those who are best advised.

GALENA MINING COMPANY.—At the annual meeting, on July 28th, 80,000 shares of the 90,000 issued were represented. The election resulted in a radical change of the directorate, which for the current year is composed of Charles Van Alstine, president; H. T. Spencer, vice-president; Harry S. Joseph, secretary; Josiah Barnett, treasurer; Frank Pierce, Dora Van Alstine and Isadore Morris. Hereafter the head office will be in Progress Building, Salt Lake, and not with the Utah company in the McCornick Building, as formerly. It is not yet decided whether an independent or joint hoisting plant will be installed for the use of the two adjoining mines, though a decision is expected soon. Galena has paid \$75,000 in dividends. The high lead percentage makes good the loss in present silver quotations and regular shipments will continue.

GRAND CENTRAL.—Gold is said to have been found on the 800 level. The management has but little to say, except two cars of ore will be marketed this week, and that others will follow in due order.

LOWER MAMMOTH.—Of several rumored discoveries during the last days of July, the one in Lower Mammoth, at least, can be put down as a certainty. An ore body is tapped near the line of the Hungarian carrying high lead percentages and 70 oz. silver. A part of Hungarian ground has just been bought from Mr. Frank Knox, the Salt Lake banker, and the company is arranging to put in a steam hoist.

TINTIC SHIPMENTS.—For the week ending July 31st: Bullion Beck, 15 cars; Centennial-Eureka, 2 cars; Gemini, 17 cars; Uncle Sam, 7 cars; Carisa, 2 cars. In addition to the foregoing, all ore: Eureka Hill, 6 cars concentrates, and Dragon Iron, 19 cars hematite, for fluxing.

MILLARD COUNTY.

(From Our Special Correspondent.)

CHICAGO PUMICE COMPANY.—It is not generally known that one of the world's choicest deposits of pumice stone is in Utah. Some 18 months ago F. A. Druehl, of Salt Lake, sold this pumice 80-acre tract, near Black Rock, on the Oregon Short Line, to Chicago parties, since which time 28 carloads have been shipped. There is an entire mountain of this material in a greater or less state of purity, the best being a most superior article. At present five men are employed. The company also owns pumice yielding ground in Nebraska. In Chicago there is quite an extensive plant, where these products are prepared for market. The capitalization of the company is \$500,000, divided into shares of \$100 each. William Quigley is president and George Ross secretary-treasurer. As the Black Rock property has been a producing enterprise for 18 months, the new pumice mine about to be opened in Miller County, Idaho, of which editorial mention was made in the *Engineering and Mining Journal* of July 24th, must yield it claim to first honors in this particular field of mining industry.

PIUTE COUNTY.

(From Our Special Correspondent.)

BLUE BIRD.—Within a month three cars of smelting ore were shipped; they averaged \$160 gold and 31 oz. silver, netting \$5,200. If desired this output could be maintained for a considerable period, but the aim of the management is rather to advance development. The main tunnel is in 275 ft. and the face shows rich ore. No. 2 tunnel, 101 ft. below, is in 105 ft., showing vein matter. A force of 10 men is employed. Last year Piute County did not figure on the list of Utah's gold producers, but this will not be the case for 1897. Blue Bird is owned by the Golden Star Mining and Milling Company, of which Capt. Timothy Egan is president, treasurer and manager. He states that exploration will be resumed this month on the Grasshopper, owned by the same company.

SEVIER.—In the crosscut on the lower tunnel, the vein was, it is said, tapped before 30 ft. had been driven. The quartz carries high gold values. No ore is being brought to daylight, and the utmost secrecy is enjoined on the miners by President-Manager Lammersdorf, while no one is allowed underground. There is a big little "if" here, but notwithstanding, if this moored find is true, it means much for the Gold Mountain district, as this is the deepest development on any vein in the entire region. Already the Sevier has furnished more than one surprise.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

HIGHLAND BOY.—For the time being the main anchorage of Bingham is the Highland Boy, and all

items referring to the property are of interest. While Mr. Newhouse was here, last week, he and Manager Weir determined on the initial point for No. 6 tunnel, which will be 104 ft. vertically below No. 5, reaching the mammoth pyritic auriferous copper ledge in about 350 ft. from the mouth, and approximately 330 ft. along the ledge, under No. 5 tunnel. Work on No. 6 tunnel was begun Monday, August 2d. Contractor Dederichs expects to turn the mill over to the company between Aug 12th and 15th. After that it will require 10 or 12 days to get the machinery in working trim, so it can be anticipated the mill will be treating ore in about a month.

MONTEZUMA.—The Heaston jigs, on dump material, have turned out considerable good shipping products—about 100 tons concentrated for July. There is a large supply of workable low-grade ore, and this output can easily be maintained, or even increased.

ROUGH & READY.—By the first of the coming week ore will be regularly forwarded to the Rogers mill. Under more favorable market conditions the mine could reasonably count on a fair margin of profit for the season.

TOOELE COUNTY.

(From Our Special Correspondent.)

ALBANY GROUP.—A mile and a half south of Pole Star, in the Clifton District, lies the Albany Group, consisting of Albany, Senator, Doctor and Kafir claims, all owned by Col. J. H. Knight, of Ashland, Wis.; H. H. Green, of Cleveland, O., and Duncan McVichie, of Salt Lake. Like that of the Pole Star the ore carries copper, gold and silver, averaging 14% copper, \$18 gold, 3 to 4 oz. silver. The vein is a contact, between limestone and syenite, and is 8 ft. thick. Exploration consists of 90 ft. tunnel, 40 ft. shaft, 49 ft. crosscut, and several pits. Mr. McVichie, when on the ground a few days ago, said, so far as his knowledge goes, the whole Deep Creek region offers the most ideal mining opportunities so soon as rail transportation is at hand.

BLACK DIAMOND MINING COMPANY.—Incorporation articles were filed with Secretary of State July 28th; capitalization \$125,000, 50c. shares, or 250,000 shares, of which 90,000 are set aside for treasury stock. Head office Salt Lake. Stock is subject to assessment, though no one assessment may exceed 2% of capital stock, nor may more than four assessments be levied in any year. Officers and directors are: Henry Sadler, president; L. W. Clark, vice-president; A. S. Day, secretary-treasurer, J. A. White and L. T. Hrockbant. The holdings of the company consist of lease and bond for \$8,000 on Black Diamond, Outcast, North Star and Union Consolidated lode claims in Rush Valley Mining District.

LION MINING COMPANY.—Articles of incorporation were filed with the Secretary of State on July 28th. Capitalization \$100,000, shares \$1. The head office is at Salt Lake City. The annual meeting will be held on the second Monday in July. Officers and directors are: S. W. West, president-treasurer; E. M. Gibson, of Omaha, Neb., vice-president; John Shelby, secretary; Barlow Ferguson and A. H. Plumb, of Emporia, Kan. The realty consists of May, Lion No. 2, Grizzly, Geneva, Empire, Emma lode claims and all interests of the incorporators in Mountain Lion, all in Dry Canyon, Willow Springs mining district.

MERCUR WEST DIP GOLD MINING COMPANY.—Incorporation articles were filed with Secretary of State July 30th; capitalization, \$125,000, shares 50c. each, or 250,000 shares in all, with 50,000 shares set aside as treasury stock. Head office Salt Lake; annual meeting first Monday in December. Officers and directors are: Arthur Murphy, president; C. L. Preble, of Mercur, vice-president; B. T. Lloyd, secretary; A. B. Jones, treasurer, and E. B. Lynch, of San Francisco. Realty consists of Monopolist Nos. 1, 2, 3, 4, 5, 6, 7, Syndicate Nos. 1, 2 in the West Dip area of the Camp Floyd Mining District.

POLE STAR GROUP.—In the Clifton mining district, a mile southeast of Gold Hill, are the Pole Star, Senate, Keno and Victor claims, owned by Duncan McVichie and associates, where an uncovering of profit-paying auriferous copper ore has taken place. The ledge is 30 ft. thick, strike east, dip 45° south, and average value 8% copper, \$3 to \$5 gold and 7 oz. silver. An incline shaft 70 ft. long is the maximum development. The ore holds its value throughout. Should the proposed railroad be built to the Deep Creek country this season the Pole Star group will be heard from.

SILVER KING.—This is a promising silver-copper prospect on Government Creek, in Erickson District, owned by George H. and Seymour Naylor, of Salt Lake. There are four claims, two shafts, 100 and 120 ft., respectively, exposing a streak of ore 16 in. to 2 ft. in width that averages 16% copper and 100 oz. silver. A tunnel to be 350 ft. long is being driven to tap the ledge at 300 ft.

WEBER COUNTY.

(From Our Special Correspondent.)

PIONEER ELECTRIC POWER COMPANY.—Within a month power will be furnished for the street cars and lighting of Ogden. Lines of six wires, each 30 to 38 miles long, and two telephone lines now connect the plant with Salt Lake. The lights of that city will soon be supplied from this source. Though several articles have recently appeared, intimating that power for industrial uses is already being furnished by the company, the first service will not

begin for some days. In the near future the power may be supplied for mining and smelting. Last week it was announced that Senator Frank J. Cannon, the company's general manager, had sent in his resignation, he not being able to give his attention to the work on account of his intended trip to Japan, as well as other pressing duties.

VERMONT.

ORANGE COUNTY.

(From an Occasional Correspondent.)

ELIZABETH MINING COMPANY.—In its mine at South Stafford this company is pushing a deep adit across the country rock to cut the vein 100 ft. to 150 ft. below the old workings. It is also sinking from the latter to connect with the adit. All the ore now being taken out comes from this old shaft. The deep adit will prove all the ground and make hoisting unnecessary for a long time to come.

WASHINGTON.
SPOKANE COUNTY.

AJAX GOLD MINING AND DEVELOPMENT COMPANY.—Articles of incorporation have been filed. The capital stock is given as \$1,000,000, divided into 1,000,000 shares of the par value of \$1 each. The trustees are as follows: W. W. D. Turner, N. E. Nuzum and E. D. Sanders, of this city; J. D. Israel, C. B. Leatherman and Dick Harper, of Dayton, Wash., and F. F. Rourke, of Portland, Ore.

SOUTH CHICAGO GOLD MINING COMPANY.—Articles have been filed for the incorporation of this company, of Spokane, with \$800,000 capital stock. The first trustees are J. D. Thomas, M. B. Terrell, George P. Cragin, Spokane; J. H. Lander, Walter Hunter, South Chicago.

WEST VIRGINIA.

MINGO COUNTY.

(From an Occasional Correspondent.)

JAMES LITTLE COAL COMPANY.—This is the name of a company which has started an operation in the Dingess field, on the Logan seam. Mr. James Little, of Piedmont, W. Va., is president of the company.

MINGO COUNTY COAL ASSOCIATION.—The coal operators of the Dingess and Inacher fields, on the Norfolk & Western Railway, met at Williamson, W. Va., on July 31st, and formed the Mingo County Coal Association. Out of the 11 operations in Mingo County eight were represented. Mr. J. C. Sinclair, of the Thatcher Coal and Coke Company, was elected president, and Mr. C. L. Ganjot, of the Camp Branch Coal Company, secretary.

WISCONSIN.

FLORENCE COUNTY.

It is reported that a large deposit of manganese exists in close proximity to Florence, Wis. The ore was found on property owned by Peter McGovern, of that city, and Mrs. T. W. Harvey, of Marietta, O. It is about four miles northwest of that city. Options have been taken on the two lots containing the manganese and the work of development has been begun.

WYOMING.

FREMONT COUNTY.

HOODOO.—Enos Carter and "Pony" Steele located the Hoodoo and four other claims on Sweetwater last fall, which are turning out well.

LARAMIE COUNTY.

HALLACK CANYON.—Surveyor General John C. Thompson has discovered and located a bed of graphite near Wheatland.

FOREIGN MINING NEWS.

AFRICA.

GOLD COAST.

WASSAU GOLD MINING COMPANY.—The June return shows that during the month 22 stamps ran 18 days, crushing 394 tons of ore. The yield was 592 oz. gold, an average of 1.27 oz. per ton. Work was stopped for 12 days on account of the flooding of the mine.

TRANSSVAAL.

The latest advices are that the Industrial Commission appointed by the Volksraad to consider the complaints of the mining industry has made its report, which recommends reductions in railroad rates and in the prices of dynamite. The question of the expropriation of monopolies is left to the further consideration of the government.

AUSTRALASIA.

NEW SOUTH WALES.

SULPHIDE CORPORATION, LIMITED.—The Exploration Company has invited subscriptions in London for £100,000 new 5% debenture stock of the Sulphide Corporation, redeemable in 10 years at 105, or at an early date at 107, on six months' notice. The stock is offered at 9 1/2%, and is to be a first charge on the company's property.

QUEENSLAND.

MOUNT MORGAN GOLD MINING COMPANY.—This company's return for June shows, as compared with previous months of this year, a large increase in tonnage of ore crushed, but a great decrease in average result. The total ore worked was 12,315 tons, and the result 12,900 oz. gold, the average be-

ing 1.05 oz. per ton. In May, 7,374 tons were treated, with an average yield of 2.25 oz. per ton.

WESTERN AUSTRALIA.

GREAT BOULDER PROPRIETARY GOLD MINES.—For the four weeks ending July 19th this company reports 2,490 tons of ore crushed, the yield being 7,200 oz. gold. The average return was therefore 2.8 oz. per ton.

CANADA.

BRITISH COLUMBIA—CASSIAR DISTRICT.

A cablegram from London states that a capital of \$400,000 has been subscribed for the construction of the Cassiar Central Railway, in the Cassiar District, northern part of British Columbia. The charter was granted the company at the last session of the provincial legislature, which also gave aid by the concession of a lease of 7,000 acres of land and the right to all minerals, including gold and silver, found therein. Parties connected with Transvaal mining enterprises are behind the company, and it is expected will lead to large developments of the Cassiar District, undoubtedly rich in mineral, but heretofore extremely remote, lying as it does between the Kootenay on the south and Alaskan goldfields on the north. Cassiar yields much placer gold.

BRITISH COLUMBIA—NELSON DISTRICT.

FERN.—The owners of the Fern mine are pushing development work. A cross vein was struck last week which is 4 ft. wide, and all the samples taken from it show an abundance of gold. It is decomposed quartz and easily mined. About 750 ft. of tunneling has been done on the Fern, in four tunnels of different levels, and Superintendent Veltch states that there is enough ore in sight to keep a 20-stamp mill running for two years continuously. The framework of the new 20 stamp mill on Hall Creek is up; it is 3,000 ft. from the mine, from which a three rail car track gravity tramway will run to the mill. It will be the first of the kind in this section; it will be elevated 15 ft. from the ground to avoid the snow in winter. Two carloads of machinery have arrived; containing part of the stamp battery, two boilers and an engine and accompany apparatus. It is determined to have everything running smoothly by October 1st. An assay office is being put in at the mill.

BRITISH COLUMBIA—SLOCAN DISTRICT.

KASLO is a busy point. This summer has witnessed great activity in a building way. Many new business enterprises have opened up during the past few months and all seem to be satisfied with the prospect. The South Fork of the Kaslo River has perhaps furnished the greatest number of good finds up to this time, with the Duncan River a good second.

ANTOINE.—The pumps at the Antoine are now in operation and a force of miners will be put on as soon as the mine is clear of water. The Antoine is said to have 36 in. of 300-oz. ore in its lower workings. The mine filled in spite of the pumps when the snow went off last spring.

BISMARCK GROUP.—Frank P. Sherwood, of Spokane, has just bonded a group of South Fork claims located this spring. The property is known as the Bismarck group and lies about one mile above the Black Fox. The figure is given at \$35,000. Mr. Sherwood is building a trail and expects to put on a developing force at once. The ore showing is said to be one of the best in that section.

BLUE BIRD.—Major J. L. Montgomery has recently resumed operations on the Blue Bird with a force of six men.

IBEX.—The Ibex of Slocan has just contracted with Bartlett Brothers for the packing out of 100 tons of ore per month for three months, and it is thought by the owners that shipments will be continued during the coming winter. This company, which sold its treasury stock at par, is now holding its annual meeting at Kaslo.

MONTEZUMA MILL.—Operations are to be started at once on the mill. T. L. Mitchell, the mill builder, has just returned from Seattle, where he submitted his plans to the principal owners. The mill is to be finished and ready for operation by November 1st.

RUBY SILVER.—Six inches of clean, high-grade galena was uncovered in what is thought to be a new lead on the Ruby Silver last Friday evening. William J. Tretheway, who last spring bonded the property for an Alberta syndicate, made the discovery.

BRITISH COLUMBIA—WEST KOOTENAY.

ORE SHIPMENTS.—The total quantity of ore produced by the Rossland mine, from January 1st to July 28th of this year, was 42,500 tons, of which 2,700 tons were concentrating ores and were milled in the camp.

ATHABASKA.—The total shipments from the Athabasca to the smelter for July amount to 80 tons, which is considered an exceptionally strong showing for the short space of time development work has been going on. Last June it was started under the direction of the British Canadian Gold Fields Company, nothing having been taken from the dump formed by the exploration work of the previous year. On all the ores shipped thus far the smelter values have been over \$75 per ton, and as depth is gained the ore shows every appearance of increased value and width, and a few days ago another rich vein was discovered and stripped for about 50 ft. The capacity of the mine is being increased, and it is now in shape to ship steadily.

Nearness to the tramway of the smelter transportation makes shipment expenses small.

CANADIAN PACIFIC EXPLORATION COMPANY.—This company, which has been successfully prospected by Mr. W. H. Corbould, formerly of London, and who has had considerable experience in the Australian gold-fields, has a number of properties throughout this province and in the Rainy River District of Ontario.

Mr. Corbould's company is largely an association of private capitalists, with a nominal capital of £500,000, with a considerable sum paid up. The company was registered in February of this year.

It was organized for the purpose of undertaking the exploration of mining and other properties. A considerable portion of the Kootenay country yet offers a large field for exploration, especially for the purpose of locating mineral properties of merit. The plan of this company is to acquire by location and otherwise good mining properties and develop to a certain stage, to be turned over to mining companies or further exploited as circumstances may warrant. The field for a development company of this character is an ample one in Kootenay alone, but the company has not solely limited its operations to this district, but includes the Rainy River District, and it may operate even outside of the Dominion.

LE ROI MINING COMPANY.—It was decided at a meeting of the company, held in Spokane, July 26th, to locate the proposed smelter at Northport, Washington. There is some disappointment felt because this industry is to be located south of the International Boundary Line and in some quarters an export duty on ores is advocated. To counterbalance the loss to Rossland by the location of the Le Roi smelter at Northport, it is reported that the War Eagle and Center Star Mines intend to erect a smelter to treat their own ores. So far, this report remains to be confirmed. At the meeting of the directors, Mr. D. C. Corbin, president of the Spokane Falls & Northern Railway contracted to carry Le Roi ores from Rossland to Northport at 75c. per ton. It is stated that Mr. Corbin has agreed to carry coke for the new smelter from Spokane to Northport at the rate of \$2 per ton. The preliminary work for the erection of the smelter has commenced. Since the decision of the Le Roi Company to erect the proposed smelter at Northport, Wash., has been made increased activity is noticeable in all departments of the Le Roi mine. The project involves an outlay which has been placed at figures ranging from \$125,000 to \$200,000.

(From Our Special Correspondent.)

JOSIE.—This mine is making small shipments of ore to Southwestern smelters. The ore is of fair grade and a good percentage of copper.

EVENING.—This property is situated immediately west of the California and northwest of the San Francisco, with the Mariposa to the south and the Eureka to the west. Recently two cuts were made close to the west line of the California and an important strike was made. At a depth of 12 ft. a vein of concentrating ore was found. The matrix is blue quartz and hornblende.

One of the great ledges traverses the camp from northwest to southeast, and has been traced southeast as far as the Red Eagle and northwest to the Comet. Its traverses the Curlew, Hattie Brown, Blue Bird, Homestake, Sunset, Phoenix, Abe Lincoln, White Bear, High Ore, Comet and beyond. Of late the efforts to open up and prove continuity of this ledge have been very persistent, and it has resulted in genuine strikes being made on the Sunset, Red Eagle and the Evening.

In the next 30 days it is expected that the full extent of the ore body in the Red Eagle and the White Bear will be determined. At the Jumbo portion of the ledge since sinking begun the ore has slightly improved in grade, and this part of it is attracting very great interest.

WAR EAGLE.—Mr. J. B. Hastings, superintendent of this mine, states that ore shipments have been discontinued until the question of smelting and transportation of Rossland ores is definitely settled. In the meantime the development of the mine will be continued as heretofore. The mine so far this year has shipped 6,533 tons.

WHITE BEAR.—The management of this mine a few days ago decided to begin the development of the 150-ft. level where there is a crosscut, and where a considerable body of fair grade ore was found. This working is now being timbered up. Sinking to the 200 ft. level has therefore been discontinued.

CARIBOO MINING, MILLING AND SMELTING COMPANY.—Although the Cariboo Mining, Milling and Smelting Company suffered a loss of \$12,000 in stolen bullion and legal expenses incurred in connection with the theft, and expended \$6,000 in new machinery, it has paid during the past year \$78,836.84 in dividends, and has \$21,297 in the treasury. To date the company has paid \$156,964.76 in dividends. At the annual meeting of the company, held recently in Spokane, the old board of directors, consisting of M. M. Cowley, James Monaghan, George B. McAuley, Edward O'Shea and C. P. Chamberlain, were re-elected to serve for the ensuing year.

At the meeting of the new board of directors held after the adjournment of the stockholders' meeting, the following officers were elected to serve for the ensuing year: James Monaghan, president and re-elected general manager; M. M. Cowley, vice president, re-elected; George B. McAuley, secretary, re-elected; Edward O'Shea, treasurer. The report says: "During the 12 months ending this date there

has been 6,742 tons of ore milled, producing 8,035 oz. bullion and 170 tons concentrates; the ore milled has averaged \$17.45 per ton. There has been 355 ft. of drifting on ore, and 100 ft. of raising on ore; 200 ft. development crosscutting; 175 ft. development shafting; 50 ft. development winze sinking, making 425 ft. of developing.

"The new machinery, consisting of a four-drill Rand compressor and a 50-H. P. boiler, was started on the first of this month. Sinking a shaft from the lower level, it is the intention to sink this shaft 100 ft., which will make the new level 275 ft. from the surface. When the work on this level is sufficiently advanced, additional stamps, power, concentrators and also a hoist should be added to the plant."

The Cariboo mine is situated at Camp McKinney, British Columbia, about 170 miles from Spokane, where 90% of the stock is owned.

NEW BRUNSWICK—ALBERT COUNTY.

MINERAL PRODUCTS COMPANY.—This company, composed principally of New York capitalists, is developing the manganese mine located in Albert County, near Hillsboro, on an extensive sale. Work was commenced this season, and at the present time between 30 and 40 men are employed. The general manager of the mine is Mr. R. P. Hoyt, of New York, and the superintendent is Mr. M. Langdon, of New York. The Salisbury-Harvey Railway has just completed a branch railway 1 1/2 miles in length, to the mine, and the Mineral Products Company are putting up new buildings at the mine and setting in new machinery. The steel smelting works at Ferrona, N. S., have been leased for one year by the company, and it is expected that shipments of ore in brick form to Ferrona will be commenced in about a month's time.

NOVA SCOTIA.

RICHARDSON.—It is reported that a rich strike has been made at Isaac's Harbor, some distance from the old McMillan mine. W. A. Hewitt, of Isaac's Harbor, is interested. Peter Cameron, of County Harbor, was in Halifax with some exceptionally rich specimens. Everything seems to indicate prosperity. The yield from the Richardson mine last month was 282 oz. gold. The brick was worth about \$5,500.

DOMINION COAL COMPANY.—Coal shipments from this company's mines in Cape Breton during the month of July amounted to 173,100 tons. For the seven months ending July 31st the total shipments were 529,695 tons against 518,368 tons for the corresponding period in 1896, and 348,702 tons in 1895.

ONTARIO—RAINY LAKE DISTRICT.

FERGUSON.—The development done on this mine shows a very considerable ore body. The mine was bought in 1896 for \$30,000 by the late W. D. Ferguson, of London. Owing to his death the mine was shut down in May, but work is to be resumed shortly. A considerable amount of development work has been done; no less than 574 ft. of shafting and 440 ft. of drifting, while the veins have been stripped to the extent of 3,000 ft. The chief lodes are four in number, viz., the Daisy, 18 in. wide; the Government vein, 3 ft. wide; the Big vein, 5 ft. wide; the Finn, 3 ft. wide, assaying \$14. The Ferguson is equipped with hoisting machinery and a three-stamp test mill, all in good order.

ONTARIO GOVERNMENT GOLD CONCESSIONS COMPANY.—The managers of this company have appointed two representatives to undertake the development of the large mineral area which they have acquired from the original concessionaries of the license of occupation, which was granted by the Ontario government recently. These gentlemen are Mr. Allen Sullivan, Rat Portage, son of Bishop Sullivan, and Mr. Ross Deacon, both mining engineers. They have already started several parties, fully equipped, in order to thoroughly prospect the whole district, and each party will have at its head a competent and experienced prospector, who, in his turn, will in the A concession be responsible to Mr. Sullivan and in the B concession to Mr. Deacon. The Concessions Company has deposited \$6,000 in the Imperial Bank at Rat Portage for the expense in the first month's development, and an equal amount will be devoted each month to that purpose. Operations began on the two concessions August 4th, when two gangs under Messrs. Sullivan and Deacon, each consisting of 30 men, were set to work.

MEXICO. SONORA.

(From an Occasional Correspondent.)

ANIMAS.—The United Verde Company, of Jerome, Ariz., has contracted for the purchase of the Animas lead, gold, silver property in Altar, 12 miles west of Llano station, provided the developments now begun prove satisfactory. A. L. Pelegrin, of Santa Ana, has contracted to open the mine.

CLEVELAND & MOCTEZUMA MINING COMPANY.—This company has suspended work in its mine at Lampazos and proceedings in bankruptcy have been begun against the company.

NACOSARI COPPER MINES.—I am informed that the transfer of these copper mines to the Copper Queen Consolidated Company, of Bisbee, Ariz., has been completed. Work is to be begun very shortly on the location of a railroad from Bisbee to Nacosari.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, August 6.
Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending July 30th, 1897, compared with the corresponding period last year:

	1897.		1896.
	Week.	Year.	Year.
Pennsylvania Railroad.....	76,807	1,882,349	2,068,415

PRODUCTION OF BITUMINOUS COAL in tons of 2,000 lbs. for week ending July 30th, and for years from January 1st, 1897 and 1896:

	1897.		1896.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	60,512	1,351,663	1,338,599
Barclay, Pa.....	599	26,137	25,251
Beech Creek, Pa.....	138,202	2,178,992	1,782,152
Broad Top, Pa.....	10,365	254,775	250,268
Clearfield, Pa.....	108,118	2,644,532	2,868,590
Cumberland, Md.....	86,762	2,179,983	2,079,492
Kanawha, W. Va.....	123,919	1,828,610	1,975,937
Phila. & Erie.....	4,336	169,671	44,471
Pocahontas Flat Top.....	93,211	1,437,368	2,210,422
Totals.....	675,964	12,100,831	12,594,282

	1897.		1896.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	5,918	740,150	596,326
Pittsburg, Pa.....	69,231	1,118,910	1,167,851
Westmoreland, Pa.....	63,747	1,169,449	1,146,254
Totals.....	138,896	2,027,609	2,910,431

Grand totals..... 764,860 15,128,440 15,504,713

Production of coke on line of Pennsylvania Railroad for the week ending July 30th, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 82,896 tons; year, 2,557,011; to corresponding date in 1896, 2,587,882 tons.

† For week ending July 21st.

Anthracite.

The anthracite market is quiet, and those interested are hoping that things will improve materially before long. Prices are, however, firmer, especially in the small sizes, and the demand is perhaps somewhat greater than last week, but there has been no increase in price.

The supply of cars is short. Stocks of country dealers are very small, and much coal must soon be shipped, but the difficulty in getting cars will stand in the way of quick delivery. The opinion of the trade seems to be that most of the coal now being shipped is to fill old orders, and very little on new contract.

Attorney-General Hancock, of New York, has filed with the Appellate Division of the Supreme Court his appeal from the decision of Supreme Court Justice Chester, vacating and setting aside the order previously granted by him appointing a referee to take testimony from the presidents of the railroads dealing in coal for the purpose of finding out whether a coal trust existed. The appeal will be argued at the September term of the court.

NOTES OF THE WEEK.

The Schuylkill Coal Exchange gives notice that the Philadelphia & Reading Collieries drawn to return prices of coal sold in July, 1897, to determine the rate of wages to be paid, show an average price of \$2.61, and the rate of wages to be paid for the last half of July and the first half of August, 1897, is 1/4% above the \$2.50 basis.

Bituminous.

The Atlantic seaboard soft-coal trade is fairly active at this time. The situation at the lower ports has, to a certain extent, been relieved by the arrival of some vessels, not nearly enough to satisfy some of the operators and consumers, though sufficient to take all the urgent orders out of the market, leaving the minds of the shippers very much easier, even though the freight market itself remains the same.

The consuming territory east of Cape Cod has an accumulation of orders to a fair extent in the hands of the shippers, though they know pretty well what to calculate on.

Sound business and the trade up to the Cape is quite active, and the demand for coal is such that those who make something of a specialty of that trade have more than they can do to get the coal forward in sufficient quantities.

New York harbor trade is fairly good, consumers taking about their usual amount.

All-rail trade is larger than it was, and it is believed that the consumers in this line have each put in a little extra stock on account of the strike now on. With regard to the effect of the strike on the Atlantic seaboard trade, the operators feel that there is now no danger of its affecting them, as although there was an advance of 5c. in most of the regions supplying the Eastern seaboard for mining last year, granted unasked on account of the condition of the trade at that time, yet now when it was never in as bad a condition and the margin of profit has been so curtailed, the operators in most cases have not asked the men to reduce the mining rate, and it seems as if this generous action would prevent any dispute arising between the operators and their men. The region supplying the Eastern seaboard appears safe, as it is apparent that the men fully recognize the state of affairs and are grateful.

Transportation from mine to tide is inclined to be slow in a majority of cases, and where much coal has been released by vessels arriving it is leaving operators a little short, and they are obliged to cal-

culate upon using every car for their needs. This is quite a different situation from that which has existed of late, with coal in quantities standing at tide. The supply of cars is generally fairly good, except to those operators that are badly in arrears in the way of discharging loaded cars at the ports of shipment.

In the coastwise vessel market, vessels are not as plentiful as is desirable. Freights are strong at current quotations, and orders plentiful.

We quote current rates of freight from Philadelphia: To Boston, Portland and Gardner, 65¢/70c.; with towages to latter port; Providence, New Bedford and the Sound, 60¢/55c.; Wareham and Portsmouth, 75c.; Salem, Bangor and Bath, 70c.; Newburyport, 80c.; Dover, 90c. and towages; Saco, 85c. and towages; 5 and 10c. are asked above these rates on charters to further lower ports.

Prices are very steady, and have not varied in the least from last week. We quote generally: \$1.75@ \$1.85 per ton, f. o. b. Baltimore; \$1.75@ \$1.80 f. o. b. Newport News and Norfolk; \$1.60@ \$1.90 f. o. b. Philadelphia; \$2@ \$2.65, alongside, New York Harbor.

Buffalo. Aug. 5.

(From Our Special Correspondent.)

Anthracite coal is fairly active at unchanged quotations for local, near-by and Canadian points. Shipments by lake have increased in tonnage, but no variation made in freight rates, which are uncommonly low.

There may be less consumption of coal in the near future, as railroads and vessels are burning successfully petroleum for fuel purposes. Bituminous coal rates are nominal, awaiting a settlement of the strike. The demand is fair and dealers do not make any concessions under the conditions which exist in the trade generally.

The shipments of coal by lake westward from Buffalo for the week ending July 31st inclusive aggregated 79,970 net tons, distributed as follows: 34,570 tons to Chicago, 11,450 tons to Milwaukee, 15,950 tons to Duluth, 4,330 tons to Toledo, 7,500 tons to Superior, 500 tons to Bay City, 1,750 tons to Green Bay, 2,150 tons to Hancock, 700 tons to Gladstone, 420 tons to Saginaw and 500 tons to Byng Inlet. The rates of freight were 20c. to Chicago, Milwaukee, Duluth, Toledo, Superior, Portage, Lake Linden, Gladstone and Hancock; 25c. to Bay City, Green Bay and Port Huron, and 40c. to Saginaw, Benton Harbor, St. Joseph and Grand Haven. Closing steady, with fair inquiry.

The coal shipments from Buffalo by lake for the month of July were 239,345 net tons, and for the season to August 1st, 669,588 net tons; a year since, 249,615 and 893,798 net tons respectively.

The Pittsburg, Bessemer & Lake Erie Railroad will commence hauling ore from Conneaut Harbor to Pittsburg next month. It is further reported that the new railroad has made a traffic arrangement with the Buffalo, New York & Pittsburg Railroad and its Rochester connection, and by means of the Philadelphia & Reading Railroad, a connection with Philadelphia and other Eastern points.

A local newspaper this morning says: "There is some uneasiness in soft-coal circles, especially as there is fear of difficulty with the Reynoldsville men. So long as they stay at work there will be coal enough to supply this section, but the moment they go out there will be a complete cutting off of all soft coal. When the former strike occurred, the freights were high enough to warrant burning hard coal in steamers, but nothing of the sort would be thought of now, for it takes as much hard coal as soft to make steam. Vessels would tie up at once if fuel should run out."

Chicago. Aug. 5.

(From Our Special Correspondent.)

Anthracite Coal.—The buying of hard coal continues in very limited quantities, this applying to both in and out-of-town trade. Inquiry is a little larger, but does not indicate any nearly increased trade. Some orders are being taken for future deliveries at present prices, but as a usual thing a couple of months is the limit on prevailing quotations. Circular prices are being held to and consumers appear more willing to pay same. Grate coal is quoted \$5.60, and egg, stove and chestnut \$5.85 per ton. Retail price on hard coal has been advanced to \$6.50 per ton from August 1st.

Bituminous Coal.—Coal remains in fair demand and is bringing better prices because of the scarcity due to continuation of the miners' strike. There is, however, considerable soft coal being offered for sale on this market and it appears a very good time for the consumer to stock up in anticipation of a long-continued strike. There appears to be no near settlement of the strike and until that is brought about it looks as though soft coal would become gradually scarcer and in consequence create harm to industries, more or less. Shipments on old contracts are being called for rapidly, indicating a better industrial condition.

Pittsburg. Aug. 5.

(From Our Special Correspondent.)

Coal.—The coal strike still continues; the coal men generally have very little to say and are disposed to let the strike run its course. Coal still seems sufficient for all ordinary purposes; there has been no stoppage of mills or factories for want of fuel. There is a good supply in the pools which can be drawn on in case of an emergency. The reports from most points are not to be relied on. Matters cannot continue much longer as they are, as the

men are becoming desperate and require the best of management to prevent bloodshed. All reports to the contrary, there is a large amount of coal being mined at various points. Railroad operations fill all urgent Lake contracts with West Virginia coal. A new coal-field at East Liverpool, O.—the Columbus field—is to be developed by Eastern capitalists. A new railroad is to be built from Lisbon through the coal-fields of Madison township, touching the Ohio River at East Liverpool. The Eastern people have 4,000 acres under lease now, the coal being mostly the Smith Ferry vein. The surveying corps for the new line are at work on the final survey. Coal prices show no change.

Locally the strike continues; reports from various points are very conflicting. The miners are making a dead set against De Armitt, of the New York & Cleveland Gas Coal Company—who say they have 215 men at work. Of course the strikers deny this. A mass meeting will be held Thursday on the Monongahela wharf. The strikers' families are undoubtedly suffering for food. Soup houses have been started at Monongahela City.

Connellsville Coke.—Production keeps up, showing the same encouraging conditions; the record shows 570 cold ovens added to the active list and an increase in production of 6,815 tons over the preceding week. The Rainey plants are all working six days and this will increase the output considerably. The blowing in of ovens and the increased production was not a spasmodic turn of the trade. The resumption was a mark of definite and lasting improvement that promises to grow as fall approaches. The demand for coke from Pittsburg and Western points was much brisker, too, though the East shows a little falling off. The shipments for the week were nearly 120,000 tons, an increase of nearly 5,000 tons. The probability of a miners' strike in the Connellsville region is very remote; the men who handle the pick are talking but very little about a strike. The wages of the miners in the region, \$1.05 per 100 bu., are within two cents of the highest wages ever paid. There are 11,835 ovens in blast with 6,817 idle; the production for the region for the week amounted to 120,647 tons, a gain of 6,915 tons, being a record-breaker. Shipments were: To Pittsburg, 2,935 cars; sent West, 2,550 cars; shipped East, 1,327 cars; total, 6,812.

Cleveland. Aug. 4.

(From Our Special Correspondent.)

The only effect of the coal miners' strike felt by the manufacturers of Cleveland is an advance in the price of steam coal, which was to-day quoted at \$2.10@2.15. It is said by the shippers of the city that there is plenty of coal to be gotten at that price. Steam coal is being shipped into the city from the West Virginia district to supply the manufacturers, and it was estimated to-day by a prominent operator that there were 1,000 cars of steam coal in the city available for use. While the operators in the Pittsburg district who have headquarters in this city favor the true uniformity plan proposed at the meeting held in Pittsburg last week, they are almost unanimously of the opinion that it will not bring about a settlement of the present strike. Mr. J. B. Zerbe, the president of the Ohio & Pennsylvania Coal Company, who was a member of the committee which prepared the uniformity plan, said to-day that it would not settle the strike. He was of the opinion that it would settle differences between the operators on and after next January, if adopted, but the affixing of signatures to it at the present time would not help the miners, for the reason that it would not help the operators immediately.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Aug. 6, 1897.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From Jan., '96.	From Jan., '97.
	Aug. 7, 1896.	Aug. 6, 1897.		
Anthracite.	39	21,100	23	12,750
Coke.....	130	155,950	107	150,350
Charcoal...	23	6,900	15	3,250
Totals	192	186,650	145	166,350
				5,989,478
				5,249,486

Business continues quiet, and no boom is yet apparent anywhere in the iron trade. The opening of August finds the blast furnaces moderately active, the range of production varying little from that of several months past. Stocks unsold are not diminishing, but, on the other hand, they are not materially increasing. This is usually a dull season in the trade, but some dealers have been hoping for a revival; it looks now if activity is to be postponed until fall at least. Whether it will come then is still uncertain.

In a time like the present, when the market is simply waiting and trying to find some indications or guides to a future course, it is well to remember that matters might be worse. Our present rate of production is moderate, but it is better than that of a year ago, and the output is absorbed pretty well. Prices are extremely low—lower than ever before—but so are costs, and work is not being done at a loss. We are gradually building up a foreign trade, which promises to reach good proportions, and which may do us good service in the future, absorbing our surplus and forming a support for the

trade when times are hard at home. Crops promise well, and prices for agricultural products are higher than they have been for a long time. This means that the farmers will have money to spend next winter, and there will be a better demand for all sorts of machinery and other iron and steel products.

In short, while we cannot take a very cheerful view of the present condition of the trade, matters are not at all desperate, and there is hope of better things in the future.

The coal strike has not yet affected the iron trade materially, but ironmen are watching it very carefully. There are no new labor troubles to report among the iron-workers.

A meeting of the conference committees of the manufacturers and of the Amalgamated Association of Iron and Steel Workers was held at Youngstown, O., this week, and an agreement was reached on the basis of \$4 per ton for puddling with a 1c. card rate for bar iron. Some minor changes in the finishing scale were also agreed on. The compromise will be generally accepted. A report is in circulation to-day that the Carnegie Steel Company has just taken some very large orders for steel rails for England, and also a large order for the Siberian Railroad. It is impossible to verify this report, owing to the absence of officers of the company.

NOTES OF THE WEEK.

On August 3d the steamship *William Auning* sailed from Santiago de Cuba for Baltimore with a cargo of 3,100 tons of iron ore for the Juragua Iron Company. With this cargo the company's total shipments of Cuban iron ore passed the figure of 3,000,000 tons.

The June report of the Southern Iron Committee shows that the average iron shipment from the South for the first six months of the current year was maintained in June, the figures being a little in advance of some months and slightly behind those of one or two months. The shipments for June were as follows: Domestic pig iron, 74,397 tons; domestic iron pipe, 8,794 tons; export iron, 17,657 tons; export iron pipe, 114 tons; grand total, 100,962 tons. Of the above amount the following was shipped from the Birmingham District: Pig iron, 57,311 tons; iron pipe, 2,812 tons; total, 60,153. The Chattanooga District was the next most important, the figures from that territory being: Pig iron, 18,214 tons; iron pipe, 3,592 tons; total, 21,806 tons. The Sheffield, Ala., District shipped altogether 11,729 tons. At least 100,000 tons of pig iron has gone abroad the first six months of this year. Ship room is all that is needed to take still larger cargoes of iron to foreign markets.

New York. Aug. 6.

Sales agents here are living in anticipation. Prices are still at a very low ebb, and in some cases have been demoralized by competition. Purchases are only small, though a few fair-sized orders were taken, but these have been standing for some time. In bridge work we understand that the contract for constructing the superstructure for the middle portion of the New Bedford and Fair Haven, Mass., bridge is still open, although the Pennsylvania Steel Company was the lowest bidder at \$98,000. There were nine bids in all for this work. The Longwood Avenue bridge in Boston, Mass., was bid for on July 30th, the lowest figure being that made by Woodbury & Leighton, \$115,000. In all there were 20 bidders. It is said that the contract for the Iliou, N. Y., bridge was awarded to the Hilton Bridge Company, of Albany, at \$13,678. The announcement is made that the Berlin Iron Bridge Company got the contract for widening the Mill Brook bridge at Eatontown, N. J., at \$2,000. In billets we understand that there were sales which aggregated 40,000 tons this week.

Within the last week exports have grown less owing to the advance in freight rates brought about by heavy grain shipments abroad. Besides August is always the dulllest month in the year for this kind of trade. Perhaps the heaviest shipments made are of machinery. Most of this was metal working machinery, which went to the other side. Both Callao, Peru, and Valparaiso, Chile, will receive a fair quantity of mining machinery. The shipments of ferromanganese from New York were rather large this week, Cardiff taking 321 casks, Swansea, 30 casks; Riga, Russia, 160 casks, and Glasgow, 114 casks. Among the orders taken this week we note two carloads of wrought-iron pipe for Sydney, New South Wales.

Old material, such as iron and steel rails, etc., shows a light export business owing to high ocean freight rates and the difficulty of securing transportation room at an advance of from 2s. to 4s. per ton over the rates which ruled a month ago. The steamship lines are understood to have freight engagements now that almost take up their space for the next 60 days, and the sailing vessels coming to this country in most cases have their return cargoes secured. However, about 1,900 tons of old rails were exported to Genoa, Italy, this week.

Consul-General Donnelly, of Mexico, has informed the State Department, at Washington, D. C., that negotiations for the establishment of a commercial agency in Mexico, under the very best American auspices, are now pending and the probability is that they will be consummated very soon.

Pig Iron.—This market is almost at a standstill. Buyers are few and many furnace representatives are even refusing to accept the orders that are in the market at present low prices. Never-

theless, we understand there are some sales-agents who will take such orders.

Southern iron is moving quietly. Prices are unchanged with the exception of No. 1 soft, which is 25c. less than our last prices.

Quotations are: Northern No. 1 X Foundry, \$11.50 @ \$12 per ton; No. 2 X Foundry, \$10 @ \$11; No. 2 plain, \$10 @ \$10.50; gray forge, \$9.50 @ \$10; Southern No. 1 Foundry, \$10.50 @ \$10.75 per ton; No. 2, \$10 @ \$10.25; No. 1 soft, \$10.50 @ \$10.75; No. 2 soft, \$10.25 @ \$10.50; gray forge, \$9.50 @ \$9.75; Basic, \$10.50 @ \$10.75. All prices are for tidewater delivery.

Cast-Iron Pipe.—Trade is looking somewhat better this week, but orders are mainly for small quantities of pipe. Prices still hold at a low level.

Spiegeleisen and Ferro-Manganese.—Local trade continues quiet. Quotations are: Spiegeleisen, 20%, \$19 @ \$19.50; ferro-manganese, 80% foreign, \$46, delivered at buyer's mill.

Steel Billets and Rods.—In billets something has been done, but wire rods are quiet. Quotations are \$16 @ \$16.25 for billets at tidewater and \$20, nominal, for rods at mill.

Merchant Iron and Steel.—Business continues quiet and prices are easy. Quotations are: Common bar, 1 @ 1'05c.; refined, 1'10 @ 1'15c.; soft steel bars, 1 @ 1'10c.; steel hoops, 1'25 @ 1'35c.; steel axles, 1'50 @ 1'60c.; tire steel, 1'05 @ 1'10c.; spring steel, 1'40c., base; links and pins, 1'50 @ 1'60c.; cotton ties, 60c. per bd. at mill.

Plates.—Business is quiet, and prices at a low ebb. We quote for universal mill plates 1'10 @ 1'15c. For steel plates prices are: Tank, 1'10 @ 1'15c.; boiler shell, 1'20 @ 1'30c.; flange, 1'35 @ 1'40c. firebox, 1'60 @ 1'75c., and 2'25 @ 2'50c. for locomotive firebox, according to quality. Charcoal iron plates are 2'25c. for shell, 2'75 for best flange and 3'25 for firebox. Rivets are 2'25 @ 2'50c. for iron and 1'75 @ 1'85c. for steel. Prices are for tidewater delivery in large quantities.

Structural Iron and Steel.—A few small orders were taken this week; otherwise the market is quiet. We quote for angles, 1'10 @ 1'15c.; tees, 1'25 @ 1'35c.; channels, 1'15 @ 1'25c. The price of beams, New York delivery, is 1'15c. for ordinary sizes, 1'20c. for 20-in., and 1'25c. for 24-in., carload lots.

Steel Rails and Rail Fastenings.—Business is rather inactive, and there is much competition as regards light rails. Quotations are \$18.50 @ \$19 per ton for standard sections and \$23 for girder rails. Lighter rails are figured on by a reliable concern as follows: 12-lb. rails, \$26 per ton at mill; 16-lb., \$24, 20-lb., 25-lb. and 30-lb., \$22 per ton.

For rail fastenings tidewater quotations are: Angle bars, 1'05 @ 1'10c.; spikes, 1'45 @ 1'50c.; bolts, 1'75 @ 1'85c.; square nuts, 1'80 @ 1'85c.; hexagon nuts, 1'90 @ 1'95c.

Wrought-Iron Pipe.—Business is moving fairly well, and export trade is good. Discounts are as follows: For plain pipe, out of store: 1 1/2 in. and over, 67, 10, 10, 10 and 10%; 1 1/4 in. and under, 67, 10, 10, 10 and 10%. Galvanized pipe, 1 1/2 in. and over, 65, 10, 10, 10, 10 and 10%; 1 1/4 in. and under, 50, 10, 10, 10 and 10%. For fair-sized orders these discounts are made with an additional 5% for less than carload lots. For carload lots this additional discount is 7 1/2% to 10%.

Nails.—Only a moderate business is being done in wire nails at unchanged prices. For carload lots on dock here, \$1.40 is quoted, while smaller quantities bring \$1.50 @ \$1.60 per keg. In cut nails there is slightly more business doing, and prices are \$1.20 per keg for carload lots at mill and \$1.30 on dock, New York. Smaller quantities are being sold at \$1.40.

Old Material.—The domestic market shows few sales and weak prices, while export business is interfered with by high ocean freight rates. Quotations are: Iron T rails, \$12.25 @ \$12.50 per ton; steel rails, \$9 @ \$10; No. 1 wrought scrap iron, \$10.50 @ \$12; hammered car axles, \$1.55 @ \$1.75 all f. o. b. cars; car wheels, \$9 @ \$10 per ton, delivered at buyer's works; machinery scrap, \$9 @ \$10; wrought pipe and tubes, \$7 @ \$8, delivered, New York; wrought turnings, \$8 @ \$9; cast borings, \$6 @ \$7; burnt iron, \$5 @ \$6 per ton, delivered at mill.

Chicago. Aug. 4.

(From Our Special Correspondent.)

Pig Iron.—There has been but a moderate buying of pig iron during the past week. Orders ran mostly for carload up to 100-ton lots. The buying was quite evenly distributed among both the Northern and Southern furnaces. Iron is going forward well on old contracts. Prices are maintained fairly well; they are as follows: Lake Superior charcoal, \$13 @ \$13.25; local coke foundry No. 1, \$10.50 @ \$10.75; No. 2, \$10.25 @ \$10.50; No. 3, \$10 @ \$10.25; local Scotch foundry No. 1, \$10.50 @ \$10.75; No. 2, \$10.25 @ \$10.50; No. 3, \$10 @ \$10.25; Southern coke, No. 1, \$10.50 @ \$11; No. 2, \$10 @ \$10.25; No. 3, \$9.75 @ \$10; Southern No. 1 soft, \$10.50 @ \$11; No. 2 soft, \$10 @ \$10.50; Ohio silveries, \$13 @ \$15; coke Bessemer, \$11.50 @ \$12.

Bar Iron.—Business in bars continues small and but few contracts of any size are being closed. Prices are quite firm, but on anything particularly large a reduction could be had from quoted prices. Common iron is quoted 1'10 @ 1'20c., and guaranteed 1'20c. up.

Steel Rails.—The buying of rails continues in small quantities and evenly divided between the

lighter and heavier sections. Quotations are for rails \$19@ \$21 Chicago.

Billets and Rods.—Both billets and rods are in limited demand. Billets are quoted at \$15 and rods \$20.50@ \$21.

Structural Material.—A few contracts for buildings outside and inside of the city were let, one being for 700 and another for 800 tons. Bridge material is in fair demand. Quotations are rather firm and are: Beams and channels, 1'10@1'20c; angles, 1'10@1'15c; plates, 1'10@1'15c; tees, 1'30@1'40c.

Scrap Iron.—Small business remains the rule in scrap. Some trading is being done in old car wheels and old rails. Quotations are: Railroad forge, \$10.50@ \$11; dealers' forge, \$9@ \$9.50; cast borings, \$2.75; Axles, \$13.75@ \$14; malleable cast, \$8.50; old iron rails, \$11.50@ \$12; old steel rails, \$7.50 @ \$8; old wheels, \$10.25@ \$10.50.

Cleveland. Aug. 4.
(From Our Special Correspondent.)

Iron Ore.—As the present is not the time of year when large transactions are consummated, but when small lots are picked up for furnace mixtures, the ore market has been quiet for the past week. A fair number of small sales have been reported, however, both in Bessemer and non-Bessemer ores. Strong and healthy views are entertained by the ore-dealers in regards to the market's future. They reason that as the business of the country as a whole is tending to larger activity, the iron and ore interests will secure a share of it. The sales made were on the following basis: Specular and magnetic ores, Bessemer quality, \$3@ \$3.75; specular and magnetic ores, non-Bessemer quality, \$2.50@ \$2.75; hematite ores, Bessemer quality, \$2.50@ \$3; hematite ores, non-Bessemer quality, \$2@ \$2.50.

The lake freight rates remain unchanged, 40c. from Escanaba and 50c. from the head of the lakes to Lake Erie ports.

Pig Iron.—There has been a slight improvement during the past week, a number of inquiries having been made and followed by sales. Practically nothing has been done in Bessemer, the sales being confined almost exclusively to the other varieties. There has been no change in the quotations for several weeks. They follow: Lake Superior charcoal, \$13.25; Bessemer, \$9.75@ \$10; No. 1, strong foundry, \$10.25@ \$10.50; No. 2, \$9.75@ \$10; No. 1, Ohio Scotch, \$10.40; No. 2, \$9.90; gray forge, \$8.50@ \$8.75.

The mining stock market has been dull for the past 10 days, the strike of the coal miners apparently stagnating business for the brokers. The only change in the quotations of stocks offered for sale on this market worthy of note is an upward tendency of Pittsburg & Lake Angeline stock, the holders of which ask \$5 more for it this week than they did two weeks ago.

Philadelphia. Aug. 6.
(From Our Special Correspondent.)

Pig Iron.—Buyers when asked why they have not made more liberal provision for future requirements at present very low prices, say in substance that production is about to increase and general business has not improved sufficiently to warrant provision for prospective needs. There are a few large consumers, however, who have bought freely. The market is irregular. Buyers are waiting for a stronger undertone. Quite a number of foundry buyers have secured quotations with options. Much iron has been shipped this week from furnaces on old contracts. The report this week is unsatisfactory. Mill men are complaining about business. Bessemer iron is \$11 but dull. There are calls for low phosphorus at \$14, makers asking \$14.50. No. 1 Foundry iron is hanging around \$12; No. 2 \$11; Standard Mill iron is plenty at \$10; Southern brands are more freely offered than taken.

Billets.—Within two days we have traced up offers at \$15.75 at seaboard. There have been sales at \$16. Buyers here pretend to have private information to the effect that a cut in prices at Pittsburg is imminent. Representatives of manufacturers pooh-pooh such talk and say that higher prices are much more probable. There were sales of sheet bars in small lots at \$18.

Merchant Bars.—Our bar iron manufacturers are growling. They thought the signing of the tariff bill would bring a lot of business at once. More business certainly is arriving, but it does not amount to much, and certainly has no influence on prices. Steel bars go quick at 1'05@1'10c, if the lot is large. Refined iron is selling some say at 1c, certainly at 1'10c.

Sheet Iron.—The inside sources of information give it out to-day that all the large consumers of sheet are strongly inclined to make large purchases. The mills have certainly more work and there is considerably more in sight. The possibility of an advance on early deliveries is being considered.

Pipes and Tubes.—A good deal of merchant pipe business we have been hearing of and figuring on, has finally gone to Pittsburg District. We have secured a few small orders and expect to run more steadily throughout the rest of the year.

Merchant Steel.—There is a good retail movement at hardening prices on spot cash sales.

Plate and Tank.—An excellent report comes this week from all our plate mills. The bridge-builders are bringing in their large orders for fall bridge construction. This has alarmed the smaller buyers and they want to be listened to first. Prices are firmer, but there is no quotable change yet.

ank plates can be had under some circumstances

at 1'10c., but the general price is 1'15c. Universals, about the same; flange, 1.30c. and firebox from 1'50c. up.

Structural Material.—There is certainly more business sent to mill than the office people tell about. The mills are running pretty full time and orders are booked daily. Quotations are: Angles, 1'10c.; beams and channels, 1'25@1'40c.

Steel Rails.—No new business of consequence is reported.

Old Rails.—Old iron rails are quoted at \$11.50 and old steel at \$10.50.

Scrap.—The scrap dealers are able to report this week considerable improvement in all kinds of scrap. Steel axle scrap sold at \$12; axle turnings, \$8.50; machinery cast, \$9.50. No. 2 light scrap is being called for and brings \$7.50.

Pittsburg. Aug. 5.
(From Our Special Correspondent.)

Raw Iron and Steel.—The market continues to move along steadily, with the local business fairly maintained and for certain products an increased demand. The iron and steel scale question is nearing a close; when that and the coal question are satisfactorily arranged you may prepare for a large fall and winter business. Arrangements have been going on for some time. Mills and furnaces which have been idle are so well satisfied with the outlook that preparations are being made to fire up in various directions. In case of failure to make a satisfactory arrangement with the Amalgamated Association, most of them will start non-union. It is hoped that both sides may see the way to make an amicable arrangement. While it was generally supposed among manufacturers that the passage of the Tariff bill would remove the last obstacle in the way for an improvement in the iron trade, its enactment has not as yet brought the increased demand which was expected. The sentiment of the trade, however, is decidedly more hopeful than it has been for some time past. While some buyers are inclined to hold back, others, who have more faith in the future, are disposed to enter the market.

It has been too often the experience of consumers that the waiting policy, purchasing as immediate requirements made necessary, has been the wisest. As to the prospects, there will no doubt be higher prices in the near future. Higher fuel, higher freights and higher ores seem to be inevitable; and if to this there was sufficient basis to warrant predictions of a better demand, there might be a stronger upward movement. In Philadelphia the most important event in the market for finished steel and iron for some days was the contract received by the Phoenix Bridge Works for the erection of a large steel bridge across the St. Lawrence River, above Montreal, Can. It will require 7,600,000 lbs. of steel.

In sheet bars the market was steady with a good trade demand; liberal transactions at \$16.50@ \$16.75 cash. In manufactured iron and steel the demand for limited amounts is increasing; prices have an upward look. The wire nail trade shows no change as regards prices or demands; limited sales reported, \$1.25@ \$1.27 a keg. In wrought iron or steel pipe business continues moderately active; the works in this vicinity are running full, mostly on small orders.

Latest.—The iron scale troubles have been finally arranged and a satisfactory scale has been arranged in the Ohio Valley. Work will be resumed at once. Valley men agreed to pay the Jones & Laughlins scale and would pay no more; unless those terms were accepted they would start non-union. They were evidently right in refusing to pay higher rates than Pittsburg. A large number of plants have started up in various directions and others are preparing to do so.

Bessemer pig is firm at quoted rates and so are billets and mill iron, with an upward tendency. Skelp steel, grooved, advanced 2 1/2c., and steel wire rods 50c. a ton. Various changes are predicted for the coming week.

COKE, SMELTED, LAKE AND NATIVE ORE.		Tons. Cash.	
10,000 B. O. to Jan. P.	\$9.69	1,500 Bill, A., S., Pitts.	14.40
10,000 B. S. O. N. Val.	9.10	1,000 Bill, A., S., Pitts.	14.25
5,000 B. A. S. O. P.	9.59	900 Bill, A., S., Pitts.	14.51
3,000 Bess. S., Pitts.	9.10	800 Bill, A., Pitts.	14.02
3,000 B. S. O. N. Val.	9.25	750 Bill, A., Pitts.	14.35
2,500 B. A. S. O. P.	9.59	500 Bill, A., Pitts.	14.05
1,500 M. I. A. S. O. P.	8.50	SHEET BARS.	
1,500 M. I. A. S. O. V.	8.01	3,000 Delivered, Pitts.	\$16.85
1,000 Bess. S. Val.	9.25	1,200 Delivered, Pitts.	16.75
1,000 M. I. O. N. D. P.	8.40	1,000 Delivered, Pitts.	16.50
1,000 Bess. A. S. P.	9.35	850 Delivered, Pitts.	16.70
500 Mill Iron, S. P.	8.50	SKELP IRON.	
500 No. 2 Fdy., Pitts.	9.50	630 W. G., Pitts.	\$1.10 4 m.
300 No. 2 Fdy., Pitts.	10.00	50 N. G., Pitts.	1.10 4 m.
100 No. 2 Fdy., Pitts.	9.75	500 Sheared, Pitts.	1.25 4 m.
50 No. 2 Foundry, all ore, Pitts.	10.00	SKELP STEEL.	
50 No. 2 Foundry, all ore, Pitts.	10.25	1,200 W. G., Pitts.	\$0.95 4 m.
50 No. 2 Fdy., Pitts.	9.50	800 N. G., Pitts.	0.95 4 m.
CHARCOAL.		200 Sheared, Pitts.	1.10 4 m.
50 Cold Blast, Pitts.	21.00	FERRO-MANGANESE.	
50 Cold Blast, Pitts.	21.50	150 80% del., Pitts.	\$16.00
50 No. 2 Fdy., Pitts.	15.30	OLD RAILS AND SCRAP.	
25 Cold Blast, Pitts.	21.00	500 I. R., gr., Valley.	\$11.50
25 No. 2 Fdy., Pitts.	15.25	500 C. W., gr., Pitts.	8.50
BLOOMS, BILLETS, SLABS.		300 W. S., gr., Pitts.	11.09
Tons. Cash.		306 S. R., gr., Pitts.	9.65
2,000 Bill, A., S., Pitts.	\$14.50	250 H. S. Sc., gr., Pitts.	9.50
		200 Cast Sc., gr., Pitts.	8.50

METAL MARKET.

NEW YORK, Friday Evening, August 6, 1897.
Gold and Silver.

Prices of Silver per Ounce Troy.

July & Aug.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	August.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
31	1.87 1/4	26 3/4	57 3/4	.448	4	1.86 3/4	26 1/4	57	.441
30	1.87	26 3/4	57 3/4	.448	5	1.86 1/4	25 3/4	55 1/2	.439
3	1.87	26 3/4	57 3/4	.446	6	1.86 1/4	25 3/4	55	.433

Owing to lower China exchanges and the absence of Indian demand, silver broke sharply this week under continued pressure of American and Australian sellers. On August 5th the market dropped 1/4d., and was quoted 25 3/4d. nominal, with 25 1/2 as best bid price. To-day a natural reaction set in, and with few offerings London closed 26d. bid and New York 56 1/2c. bid.

The United States Assay Office in New York reports the total receipts of silver at 93,000 oz. for the week.

Average Monthly Prices of Silver

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

Month.	1897.		1896.		1895.	
	Lon- don. Pence.	New York. Cents.	Lon- don. Pence.	New York. Cents.	Lon- don. Pence.	New York. Cents.
January	29.74	61.79	30.69	67.13	27.96	59.69
February	29.68	64.67	31.01	67.67	27.47	59.20
March	28.96	63.06	31.34	68.40	28.33	61.98
April	28.36	61.85	31.10	67.92	30.39	63.61
May	27.86	60.42	31.08	67.85	30.61	63.75
June	27.58	60.10	31.46	68.69	30.47	63.61
July	27.36	59.61	31.45	68.75	30.48	63.75
August			30.93	67.31	30.40	63.61
September			30.19	65.68	30.54	63.90
October			29.68	65.05	30.89	67.64
November			29.46	64.98	30.79	67.42
December			29.70	65.24	30.40	63.61
Year			30.07	67.06	29.53	65.28

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

Gold and Silver Exports and Imports

At all United States ports, June, 1897, and years from January 1st, 1897, 1896, 1895, 1894:

	Coin and bullion.		In ores.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
June.	\$7,623,878	\$650,343	\$130	\$410,640	E. \$6,533,025
1897.	25,000,717	3,715,240	93,188	2,220,314	E. 19,158,551
1896.	42,935,551	25,189,431	100,811	717,635	E. 17,129,296
SILV.					
June.	5,086,863	954,882		2,044,013	E. 2,678,568
1897.	27,894,900	4,419,889	259,150	10,610,482	E. 13,133,899
1896.	29,927,230	5,943,743	685,284	8,527,814	E. 16,140,957

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

Gold and Silver Exports and Imports, New York

For the week ending August 6th, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

Week	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1897.	\$757,900	\$297,929	\$789,340	\$60,329	E. \$1,188,962
1897.	28,045,116	2,445,671	30,619,527	1,256,407	E. 54,362,543
1896.	40,327,798	17,494,397	22,114,713	1,388,102	E. 43,560,012
1895.	35,963,682	24,246,440	24,909,751	1,844,075	E. 35,342,988
1894.	81,281,301	11,543,335	22,024,306	1,023,564	E. 90,735,766

Of the gold exported for the week \$750,000 went to Germany, and the balance to the West Indies and South America; of the silver \$43,000 went to South America and the remainder to London. The gold and silver imported came chiefly from Central and South America.

FINANCIAL NOTES OF THE WEEK.

General business is in a somewhat unsteady condition. On the one hand there are some evidences of an increasing volume of trade, but on the other there is still much complaint of slow sales and slower collections. Several of the large Eastern cotton mills have shut down for a period which is still uncertain, owing to small sales and heavy stocks. Upon the whole, matters are still quiet, with little change.

Speculation is not very active and sales of shares on the stock markets, so far as our people are concerned, are largely conducted by insiders and brokers. Prices of stocks have risen somewhat on the assumption of an improvement in business to follow the settlement of the tariff question. It is reported that a large part of the sales have been of stocks sent from London to realize on the recent improvement in quotations.

The rate of sterling exchange has fallen somewhat, and gold exports are not profitable just now. There have been very heavy engagements of grain for export this fall, and it is apparent that our shipments abroad will be large for the rest of the year. Wheat continues at a high price, though there has been a slight reaction this week.

There continues to be a strong demand for gold in London, as Russia, Austria and Germany are still buyers. It is understood also that Japan will take a considerable amount toward the end of August.

It is announced from London that the final meeting between the members of the Bimetallic Commission, headed by Senator Wolcott and Lord Salisbury, will take place during the latter part of next week at the Foreign Office. Most of the members of the Cabinet will be present, and it is understood that Lord Salisbury will then inform the commissioners of the government's decision on the question of a more extended use of silver. The commissioners intend after the meeting to proceed to Berlin and St. Petersburg.

It is understood that Mr. H. H. Hanna, acting under the instructions of the Indianapolis Convention, will shortly call a meeting of the Executive Committee, and will appoint a commission to prepare a plan of currency reform for submission to Congress next December. The Secretary of the Treasury will have his own plan also, but announces his intention to work in harmony with the proposed commission.

A despatch from San Francisco says that all the Mint records were broken by the receipts at the Mint in that city on August 3d, when \$3,750,000 in gold was deposited for coinage. Of this amount, \$750,000 was the property of the Alaska Commercial Company, and the balance was deposited by miners and smelting companies. It is said that this far exceeds any single day's deposits at any one mint.

The statement of the United States Treasury for July, the first month of the new fiscal year, is as follows:

	1896.	1897.
Customs.....	\$12,157,331	16,966,802
Internal revenue.....	14,302,532	19,767,832
Miscellaneous.....	2,569,316	2,292,730
Total receipts.....	\$29,029,179	\$39,027,364
Expenditures.....	42,888,462	50,100,968
Deficit.....	\$13,859,283	\$11,073,604

The payments increased largely, though the revenue was increased by heavy importations in advance of the new tariff. The showing is not at all a good one.

The statement of the United States Treasury, on Thursday, August 5th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	July 29.	Aug. 5.	Changes.
Gold.....	\$143,371,551	\$140,173,373	D. \$3,298,181
Silver.....	33,665,593	33,047,501	D. 618,092
Legal tenders.....	28,764,881	31,982,180	I. 2,517,299
Treasury notes, etc.,	31,873,314	31,842,314	D. 30,970
Totals.....	\$237,775,345	\$236,345,401	D. \$1,329,944

Treasury deposits with national banks amounted to \$17,003,352, a decrease of \$1,296,648 during the week.

The statement of the New York banks—including the 60 banks represented in the Clearing House—for the week ending July 31st gives the following totals, comparisons being made with the corresponding weeks in 1896 and 1895:

	1895.	1896.	1897.
Loans and discounts.....	\$509,327,000	\$469,535,900	\$542,996,200
Deposits.....	574,304,500	485,914,000	623,045,000
Circulation.....	13,163,000	11,800,000	13,451,100
Reserve:			
Specie.....	65,474,800	46,254,700	91,497,400
Legal tenders.....	119,018,500	92,727,400	109,984,000
Total reserve.....	\$184,493,300	\$138,982,100	\$201,481,400
Legal requirement.....	143,326,122	121,253,500	135,761,250
Surplus reserve.....	\$41,167,178	\$17,728,600	\$65,720,150

Changes for the week this year were increases of \$2,921,600 in loans and discounts, \$519,300 in deposits, and \$119,500 in specie; decreases were \$13,500 in circulation, \$1,631,100 in legal tenders, and \$1,641,425 in surplus reserve.

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

Banks.	1896.	1897.
N. Y. Asso.	\$16,251,700	\$91,497,400
England.....	235,715,735	174,931,299
France.....	411,758,553	\$251,128,541
Germany.....	212,655,000	224,335,000
Austro-Hun.	137,475,000	185,103,000
Netherlands.	13,175,000	13,053,000
Belgium.....	13,310,000	29,551,800
Spain.....	42,928,000	56,811,000
Italy.....	69,175,000	10,320,000
Russia.....	151,710,000	470,900,000

The return for the Associated Banks of New York is of date July 31st; all the others are of August 3d, except the Bank of Italy, June 20th, and the Bank of

Russia, June 23d-July 5th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Shipments of silver from London to the East for the year up to July 15th are reported by Messrs. Pixley & Abell's circular as below:

	1896.	1897.	Changes.
India.....	£1,918,578	£2,847,700	I. 929,122
China.....	564,612	100,942	D. 463,670
The Straits.....	537,532	106,405	D. 431,127
Totals.....	£3,020,722	£3,055,047	I. 34,325

The decrease in the shipments to China is especially marked.

Indian Exchange is a little easier, but is still high, the average price for Council bills in London having been 15 1/3d. per rupee. The new rupee paper loan has now been announced. It is for three crores—30,000,000 rupees—to carry 3 1/2% interest, and bids will be received until August 16th.

Prices of Foreign Coins.

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

	Bid.	Asked.
Mexican dollars.....	\$.43	\$.46
Peruvian sole and Chilean pesos.....	.40	.43
Victoria sovereigns.....	3.87	4.90
Twenty francs.....	3.87	3.90
Twenty marks.....	4.78	4.80
Spanish 25 pesetas.....	4.78	4.85

Other Metals.

Copper.—The market is still bare of any new feature. Producers and consumers continue the same attitude as during the last few weeks, the former holding firmly for full prices and the latter showing a reluctance to supply their future needs, except at lower values. The statistical position of the article, notwithstanding the increased output, remains favorable, the surplus supplies being totally absorbed by the foreign demand, which continues strong. Foreigners have made few new purchases during the last few weeks, but there are already indications that they may very soon have to enter the market, and if that should happen to be at a time when consumers here want to supply themselves too, it may result in an ad-

Imports and Exports of Metals.

Port.	Week, July 29.		Year, 1897.	
	Expts.	Impts.	Expts.	Impts.
*New York.				
Aluminum, boxes.....	325	25	2,288	833
Antimony ore, short tons.....				471
" regulus, casks.....				160
Brass, old.....short tons.....	45		453	5,258
Copper, fine.....long tons.....	\$1,150	2,292	24,642	161
" matte.....			4,780	5,570
" sulphate.....	10		4,642	100
Ferro-manganese.....	458		2,064	9
Iron ore.....				2,167
Iron, pig, bar, rod.....	2,270	100	9,066	46,304
" pyrites.....				3,545
Lead, antimonial.....				150
" bullion.....	\$464	1,147	22,639	84
Manganese ore.....				6,225
Nails.....	59		814	11,462
Nickel.....	500		6,225	12,218
" old.....				4,004
Spiegelisen.....	292	10	15,073	111
Steel billets, rods.....			200	179,312
Tin.....	74		1,117	1,119
" dross.....			19,167	166
" and black plates, boxes.....				
Zinc.....long tons.....				
" dross.....	2			
†Baltimore.				
Brass scrap.....			10	5,511
Chrome ore.....long tons.....			23,724	27
Copper, fine.....	522		1,610	315
" sulphate.....			3,314	231
Ferro-manganese.....	21	20	3,314	165,265
Ferro-silicon.....			162	2,273
Iron ore.....			4,134	500
Iron ore, pig, bar, etc.....			717	6,459
Lead.....			120	931
Manganese.....				2,710
Spiegelisen.....			101	3,334
Steel.....			84	8,898
" wire.....bundles.....	10		1,613	5,714
Tin.....long tons.....			770	19,227
" and black plates, boxes.....			500	48
Zinc.....long tons.....			63	115,202
" dross.....			129	
‡Philadelphia.				
Antimony.....casks.....				2,712
Chrome ore.....				309
Copper ore.....long tons.....				21,915
Ferro-manganese.....				48
Iron ore.....			4,100	123,792
Iron pyrites.....				1,500
Manganese ore.....			3,003	79,855
Tin.....				448
" and black plates, boxes.....			13,115	41,867

*New York Metal Exchange returns. †From our Special Correspondent. ‡Week ending July 30. §Week ending Aug. 5.

vance of values. Consumption is improving but slowly, except in wire, for which there has been a decidedly better demand during the last few weeks than for months previous thereto. Slightly lower prices have been accepted for Lake, which description we have now to quote at 11c., while electrolytic in cakes, bars or ingots remains unchanged at 10 1/2% @ 10 3/4c.; cathodes, 10% @ 10 1/2c., and casting copper, 10% c.

The foreign market continues to move within very narrow limits, the opening quotation this week being £47 15s., and the closing price to-day £47 17s. 6d. for spot g. m. b.'s. The statistics for the second half of last month show an increase of 100 tons, which is considered rather a favorable result, in view of the extremely large exports from this side, as it indicates not only a continuance of the large consumption abroad, but rather an expansion. We quote manufactured sorts: English tough, £50 10s. @ £51; best selected, £51 5s. @ £51 15s.; strong sheets, £58; India sheets, £53 @ £54; yellow metal, 4 3/4d.

Up to the middle of July the Hall mines, British Columbia, had shipped 133 3 tons of blister copper to Liverpool, via Montreal. This material averages about 96% copper, 515 oz. silver, and 1 1/2 oz. gold per ton.

Tin has fairly well resisted the unprecedented break in silver, and especially may this be said of spot, which still commands 13 80c.

The foreign market, which at the beginning of the week opened at £61 12s. 6d., has since declined to £61 2s. 6d., this being the lowest and closing price of the week. Consumption is improving, while production is falling off; at least that would seem to be the case, judging by the decreased shipments from the East, unless supplies are held there awaiting a better market. The statistics for the month of July show a decrease in the visible supplies of 200 tons.

The shipments of tin from Australia and the Straits in July are estimated at 3,730 tons, and the deliveries for the month at 4,204 tons. The visible supplies on August 1st were as follows, in long tons:

	In store.	Afloat.	Totals.
London.....	18,917	1,665	20,582
Holland.....	5,953	1,296	7,249
U. S., exc. Pacific ports.....	1,895	3,000	4,895
Totals.....	26,765	5,961	32,726

The total supply shows an increase of 649 tons over July 1st, but a decrease of 894 tons as compared with August 1st, 1896.

Lead is weak on account of increased offerings and small desire on the part of consumers to increase their supplies. The market closes with 3 67 1/2c. as the best bid.

The foreign market continues strong, the quotation for Spanish being £12 10s., and for English £12 12s. 6d. Supplies of spot lead are scarce, and still higher prices are looked for.

The New York Metal Exchange estimates the arrivals of lead at the port of New York during July at 5,300 long tons, of which 4,500 tons came from Mexico and 800 tons from Europe. Exports of Mexican lead in bond for the month were 3,204 tons, all to Europe. Entries and withdrawals of lead for consumption were 2,900 tons. The total stock in bond at New York and near-by ports on August 1st was 2,566 tons.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is weak and lower. Buyers are holding off in anticipation of securing lead at a lower price later on. Sellers, as a rule, are not forcing their holdings on the market, but there are a few who have shown considerable anxiety to unload and this has made the market decidedly stumpy.

Spelter seems easier, the price at St. Louis being 4 05 @ 4 10c., and that in New York 4 25 @ 4 30c.

The foreign market is a shade firmer, the quotation being £17 for good ordinary brands, and 2s. 6d. more for specials.

Antimony is somewhat firmer, prices now quoted being as follows: 8c. for Cookson's; 7 1/2c. for Hallett's; 7 1/4c. for U. S. Star, and 7 1/2c. for Japanese.

Aluminum.—It is announced that the Pittsburg Reduction Company has made a sale of 1,000 tons of aluminum to go to Great Britain. The price is not stated. The deliveries will extend over a considerable time.

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

Platinum.—Prices are firm at \$14 @ \$15 per oz. New York. The London quotation is 55s. @ 56s. per oz.

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

Quicksilver.—The New York quotation is unchanged at \$39 per flask. The London price is £7 5s. per flask, with £7 2s. 6d. quoted from second hands.

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

Aluminum:	Bismuth, 2 lb.	\$1.50@1.50.
No. 1, 98% ingots, 2 lb. 37@47c.	Phosphorus, 2 lb.	50@55c.
No. 2, 94% " " 31@34c.	Tungsten 2 lb.	70c.
Ingots, scrap, " " 30c.	Tungstic acid.....	45c.
Rolled sheets, " 46c. up	Ferro-tungsten, 63%	60c.
Alum.—Nickel, " 35@40c.		

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

Average Monthly Prices of Metals

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

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1897.	1896.	1897.	1896.	1897.	1896.	1897.	1896.
Jan.	11 75	9 87	13 44	13 02	3 04	3 08	3 91	3 75
Feb.	11 92	10 64	13 59	13 44	3 28	3 19	4 02	4 03
March ...	11 80	11 03	13 43	13 30	3 41	3 14	4 12	4 20
April ...	11 48	10 98	13 31	13 34	3 32	3 07	4 13	4 07
May	11 03	11 15	13 44	13 51	3 25	3 03	4 21	3 98
June	11 11	11 07	13 77	13 59	3 33	3 03	4 21	4 10
July	11 11	11 40	13 89	13 63	3 72	2 96	4 32	3 97
August ..	.....	10 98	.....	13 49	.....	2 73	.....	3 76
Sept. ....	.....	10 66	.....	13 15	.....	2 77	.....	3 60
October ..	.....	10 66	.....	12 91	.....	2 80	.....	3 72
Nov. ....	.....	11 23	.....	13 09	.....	2 96	.....	3 99
Dec. ....	.....	11 28	.....	12 96	.....	3 04	.....	4 14
Year ..	.....	10 78	.....	13 29	.....	2 98	.....	3 94

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements see page 180.)

New York. Aug. 6.

Heavy Chemicals.—Though the market shows no radical change from last week, importers and dealers are anticipating a better demand. Alkali just now is selling only in a small way. Glass-works generally are shut down and will not resume before September 1st, so this quarter of the consuming territory is featureless.

Many of the importers of heavy chemicals have fairly large stocks on hand, which had been accumulated during the tariff debate. Prices show a few changes owing to the new duties.

Quotations generally are about as follows: Caustic soda, 60%, \$2.22½@2.42½; 70% 76%, \$2@2.25 per 100 lbs. Alkali, domestic, 58%, 60c. for 50-ton lots and over, and 70@80c. for smaller quantities; 48%, \$1@1.20 for jobbing lots. Carbonated soda ash, 48%, 90@95c. per 100 lbs.; 58%, 75@80c. per 100 lbs. Bleaching powder, prime brands, \$1.87½@2.2; Continental Brand, \$1.85@1.90; other brands, \$1.80@2.2 per 100 lbs. Bicarb. soda, English, 1.75@2c. per lb.; American, bulk, \$1.50@3.50 per 100 lbs., according to brand. Sal-soda, English, 67½@70c. per 100 lbs.; American, 65@70c. per 100 lbs. Chlorate of potash, \$9.50@10 per 100 lbs.

Acids.—While some say the prospects of a good demand are becoming more promising others intimate that buying still continues on a small scale. Several textile mills in the East are closed, and those that are in operation are only consuming moderate quantities of acids. Blue vitriol is quoted less than last week, and in explanation we learn that the demand for export is about satisfied by the deliveries in spring. Oxalic acid is being bought in a fair way, while the inclement weather has curtailed the demand of sulphuric acid from soda-water manufacturers.

Our quotations show little change. They are per 100 lbs. in New York and vicinity in lots of 50 carboys or over as follows: Acetic acid, commercial No. 8 (in barrels), \$1.40@1.50; in carboys, \$1.50@1.65; redistilled, 28% in bbls., \$1.70@1.80; in carboys, \$1.90@2.05. Muriatic acid, 18%, 75@85c.; 20%, 85@95c.; 22%, \$1.15@1.25, according to make and quantity. Nitric acid, 36%, \$3.50@4; 40%, \$4@4.50; 42%, \$4.50@5.50. Oxalic acid, 87 ex-dock and \$7.25 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66%, 85c.@1 in carload lots, 10@15c. higher for small quantities. Chamber acid, \$6@6.50 per ton at factory. Blue vitriol, \$3.75@4, according to grade and order.

Brimstone.—Although the market is firmer abroad the demand on this side is still rather limited. There have been two arrivals this week, the *Gottfried Shenck* with 1,500 tons, and the *Flower Gate* with 1,000 tons. Spot sulphur is quoted at \$21 per ton for best unmixed seconds, and \$20.50@20.75 to arrive. Thirds are quoted at \$19.75@20 per ton.

Fertilizing Chemicals.—Leading ammoniates are in good demand, and buying for consumption in the South continues fairly active. The other fertilizing chemicals are moving forward rather slowly, while prices are unchanged.

Sulphate of ammonia, gas liquor, \$2.10 for shipment, and \$2.20 for spot; bone, \$2.@2.05 per 100 lbs. Dried blood, high grade Western, \$1.75@1.80 per unit New York; \$1.60@1.65 per unit f. o. b. Chicago. Azotone, \$1.70@1.75 basis New York. Concentrated phosphate (30% available phosphoric acid), 57½c. per unit. Acid phosphate, 13%@15%, av. P₂O₅, 54@55c. per unit at sellers' works in bulk. Dissolved bone black, 17%@18% P₂O₅, 80c. per unit. Acidulated fish scrap, \$8.50@9, and dried scrap \$17.50@18, f. o. b. fish factory. Tankage, high grade, \$14@14.50 per ton; concentrated, \$1.35@1.40 per unit, f. o. b. Chicago; New York, \$18.50; low grade, \$16.50@17. Bone tankage, \$19@20; ground bone, \$21@23. Bonemeal, \$19.50@22.50.

Sulphate of Potash: 90%, New York and Bos-

ton, \$1.90½; Philadelphia, Baltimore and Norfolk, \$2.01; Southern ports, \$2.03.

Double Manure-Salt: Quotations for 48@49%, less than 2½% chlorate, are 1'01@1'01½c., to arrive, and 1'02@1'03c. on spot; basis of 48%. High grade, 90@98% sulphate of potash, 1'96½@2'00½c. to arrive; basis of 90%. In bulk 24@36%, 36½@37½c. per unit O. P.

Muriate of Potash: We quote: New York and Boston, 1'75@1'78c. Philadelphia and Norfolk, 1'76@1'79½c.; Charleston, Savannah, Wilmington and New Orleans, for 80@85% basis of 80%, 1'78½@1'81c. in lots of 50 tons and upward.

Kainit.—Invoice weights, as taken at port of shipment, per ton of 2,240 lbs., testing 12½% actual potash, equivalent to 23% sulphate of potash, \$8.80@8.90.

Nitrate of Soda.—There is certainly a weaker tendency; prevalent in the market just now, and the price quoted is on a par with that ruling in 1895. Our deliveries of nitrate of soda within the last month have been less than for the corresponding period last year, while our stock on hand and afloat continues to increase. Unless the demand becomes more active and our imports are lessened somewhat there is a possibility of a further decline in prices. The general quotation to-day is 1'67½c.

Messrs. Mortimer & Wisner, the well-known brokers of New York, in their monthly report dated August 2d, state as below:

	1897.	1896.	1895.
	Bags.	Bags.	Bags.
Imported into Atlantic ports from West Coast S. A., from Jan. 1 to date.....	294,241	548,239	482,763
Stock in store and afloat Aug. 2, in New York....	99,741	92,613	91,861
Boston.....	2,080	.....	2,436
Philadelphia.....	.....	.....	5,200
Baltimore.....	3,000	2,500	3,500
Norfolk, Va.....	.....	.....	410
Charleston.....	.....	.....	1,200
To arrive, due Nov. 15.....	250,000	163,000	170,000
Vis. supply to Oct. 15.....	354,821	258,113	274,597
Stock on hand Nov. 1.....	123,593	53,839	58,367
Deliveries past month.....	44,070	58,127	30,597
Deliv. since Jan. 1 to date.....	318,093	509,465	436,533
Total yearly deliveries.....	.....	746,264	828,042
Prices current Aug. 2.....	1'67½	1'77½	1'67½@1.70

NOTES OF THE WEEK.

The Columbia (S. C.) Phosphate Company, of which W. A. Clark is president, will, we understand, increase the capacity of its acid chambers about 50%. Pyrites burners will replace the brimstone burners now in use.

It is announced that Mr. F. I. Smith will establish a large plant near New York to refine crude borax. The borax for Mr. Smith's refinery will be shipped from Southern California in a raw state. The duty on imported borax is now \$6 per ton.

The Farmers' Mining Company, of Charleston, S. C., has made a sale of 1,900 tons of phosphate rock from Coosaw River to Mitsui & Company, of Japan. The shipment will be made direct to Yokohama from Beaufort. Another shipment, it is said, will be made of 3,300 tons in August to the same place.

The Charlotte Harbor Lighterage and Stevedore Company reports the shipments of phosphate rock through the port of Punta Gorda, Fla., in July, 1897, at 4,397 tons domestic and 9,816 tons foreign; a total of 14,213 tons. The total shipments for the seven months of this year is 74,542 tons, of which 34,098 tons were domestic, and 40,444 tons foreign. This phosphate rock was shipped by the Peace River Phosphate Mining Company.

Liverpool. July 27.

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

Since our last advice there is little change to report with regard to the chemical market.

Soda ash does not attract much attention from buyers. Quotations vary considerably according to export market, and the range for tierces is about as follows: Leblanc ash, 48%, £4 5s.@£4 10s.; 58%, £4 10s.@£4 15s. per ton net cash; ammonia ash, 48%, £3 7s. 6d.@£4; 58%, £3 12s. 6d.@£4 5s. per ton, net cash. Bags are 5s. per ton under the price for tierces. Special tierces for American business. Soda crystals are in fair demand and are quoted at from £2 7s. 6d.@£2 17s. 6d. per ton, less 5% for barrels, and 5s. less for bags, according to export market. Special quotations for American orders.

Caustic soda is in moderate supply, and quotations are well sustained. We quote spot range as follows: 60%, £6 3s. 9d.@£6 5s.; 70%, £7 3s. 9d.@£7 5s.; 74%, £8 2s. 6d.@£8 5s.; 76%, £8 15s.@£9 per ton, net cash.

Bleaching powder is flat, and is nominally quoted at £6 12s. 6d.@£6 17s. 6d. per ton net cash for hard-wood packages as to destination.

Chlorate of potash is rather idle, and 3¼d.@4d. per lb. is about the nominal spot range.

Bicarb. soda is in request, and is firm at £6 15s. per ton, less 2½% for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is inactive, but prices are fairly steady at about £7 16s. 3d.@£8 per ton, less 2½% for good gray 24%@25% in double bags f. o. b. here, as to quality.

Nitrate of soda is dull at £7 17s. 6d.@£8 per ton, less 2½%, for double bags f. o. b. here, as to quantity and quality.

Carb. ammonia, lump, 2¼@3d. per lb.; powdered, 3@3¼d. per lb., less 2½%.

MINING STOCKS.

Complete quotations will be found on pages 176, 177 and 178 of mining stocks listed and dealt in at:

Aspen.....	London.
Baltimore.....	Los Angeles.
Boston.....	New York.
Butte.....	Philadelphia.
Cleveland.....	Pittsburg.
Colo. Springs.....	Salt Lake.
Denver.....	San Francisco.

New York. Aug. 6.

A better tone is noticeable in the local mining stock market, and in many instances prices have advanced this week.

On the Consolidated Stock and Petroleum Exchange the Comstocks are mostly being dealt in now, and among these Best & Belcher and Consolidated California & Virginia have been in good request. Of the California stocks Brunswick Consolidated rise from 14c. early in the week to 20c. at the close, which is the highest price since January last. Sales of this stock were rather large, and it is intimated that the stock is being bought by insiders for the mines on the Brunswick property. A telegraphic dispatch from the superintendent states that the mines produced \$3,700 in free gold during July.

On the Mining Exchange business has been variable; one day it was active, another quiet, and at the close this week it is featureless. Prices are low and transactions are confined to a few stocks only. Annetta and Miami, sister corporations, located in Colorado (not Cripple Creek), are the feature on this board. The former is quoted at 4c. and the latter at 35c.

The Klondike gold craze is still raging in this quarter, and several brokers whose earnings have grown less within the last year or so from an inactive mining stock market are now joining syndicates to explore the Northern auriferous deposits, of which an endless number are forming.

Boston. Aug. 5.

(From Our Special Correspondent.)

The market for copper stocks has been rather quiet the past week, not sympathizing with the general movement in stocks, which has been larger than the average. Copper stocks have had quite an upward movement in the past, and now they are resting, influenced by the tone of the market for ingot copper.

Calumet & Hecla has taken the lead this week, and although only \$5 per share advance was made it is the highest point ever reached, and figures \$40,000,000 for the property. Arnold has gained from \$3 to \$3½. Atlantic advanced from \$20 July 24 to \$22. Centennial holds steady around \$7 with no great activity. Franklin gained from \$14½ to \$15½. Kearsarge declined from \$18½ ex-dividend to \$17½, and Osceola from \$37 to \$35½. Quincy is one point higher at \$114. Tamarack \$2 off at \$130, and Tamarack Junior declined from \$18½ to \$17½. Tecumseh showed no change, last sale being \$2, assessment paid. Wolverine advanced slightly from \$11½ to \$11¾, and holds its own very well.

Boston & Montana, which was off last week to \$128½, rallied to \$134½, and again off to \$132½, closing \$134½. Butte & Boston down to \$22 last week, rallied to \$24½ and again off to \$23½, closing \$23½. Old Dominion Copper was up to \$18½ last week, and is off to \$19, closing steady.

Gold stocks are not in special favor. Gold Coin hangs around \$3¼, the reduction of the dividend from 10 to 5c., being rather a damper upon it. Merced declined from \$7½ to \$5½ on rumors of a \$2 assessment, but later the price advanced to \$7. Pioneer, which was down last week to \$4½, rallied later to \$5½. This company has issued the balance of its treasury stock, making the total capital 100,000 shares. Santa Ysabel declined from \$14 to \$13½, with little doing.

3 p. m.—The market this afternoon shows very little spirit, with exceedingly limited transactions. Boston & Montana on sales of 59 shares went off to \$134. Butte & Boston was \$23½, sales of 600 shares Quincy one lot at \$113, as before. These cover the leading features and reflect a very dull market.

Los Angeles, Cal. July 31.

(From Our Special Correspondent.)

Business has been good and the market active on the Los Angeles Mining and Stock Exchange this week. There were no special favorites in the list of stocks called, but Magganetta was traded in a good way owing to the reports received from the property. Pacific Consolidated was strong, but there has been no particular advance in it. The other stocks were strong and active and everything looks well for the coming week. The total sales made was 396,000 shares, against 177,300 shares last week; an increase of 218,700 shares.

Salt Lake City. July 31.

(From Our Special Correspondent.)

Something akin to a panic has pervaded the local mining share market as a result of the silver drop, and in the silver shares prices of a

week ago are practically cut in two. Nor is the worst feature reflected in the published quotations. Hypothecated silver shares are not regarded as good collateral at the banks and holders are insisting upon their immediate redemption. Some heavy individual sacrifices have been made in the week and many others are expected. In reality matters are not so bad as they appear on the surface.

By sympathy this condition is reflected in the golds, these shares being offered as redemption for silvers held as collateral.

Ajax fails to recover strength, and while wanted it is at shaded figures. No reorganization of the board has yet been effected, and it is now nearly a certainty that none will take place until the annual meeting in October. Anchor is stationary at 95c. in the absence of any inquiry.

The almost positive assurance by the management of Bullion-Beck that a dividend will be paid in August has strengthened the stock, and in spite of silver's decline it records an advance. Conditions at the mines are exceptionally good.

Centennial-Eureka is even lower, and though buyers and sellers are very near no business is done. Bids of \$31 are more attractive to holders than offers at \$33 to purchasers. Dalton & Lark is without action or change, the stock being on the market at the ruling price of the past six weeks.

Daly is the great sufferer, the closing figures of the preceding week being cut in two. Threatened labor troubles, coupled with the silver drop, are the causes and aggravating these is a heavy draft on the working force. The management declares its intention of operating the Marsac mill as long as the silver contents are sufficiently high, provided the wage reduction is accepted. It is now almost a certainty that no opposition to the cut will be offered by the miners. Daly-West is inactive, but reflects the gloomy conditions affecting the silver stocks. Emerald is stronger, the result of a favorable disclosure in the shaft. This is one of several prospects being sunk for the extension of Centennial-Eureka vein. Galena, which gained some strength immediately after the annual meeting, lost it with the silver drop. Grand Central is credited with an important disclosure in the east drift of 800 level, where a breast of \$60 gold ore, 15 ft. high, has been exposed. The stock is offered at par without any local inquiry.

The volume of the week's business was done in Geyser-Marion. Theodore Bruback, of the old Marion company, relinquished 15,000 shares at a figure below the market price, for delivery in Boston. Nearly all the floating stock has been gathered up, the buyers being favored by the slump in silver which brought the price down. The fourth monthly dividend of 3c. (\$9,000) was paid to-day, wiping out all the old Geyser stock. At the time of the consolidation of Geyser and Marion an assessment of 11c. was levied on the former to clear indebtedness. Current dividends have been applied on this, that of to-day giving Geyser 1c. over balance due on assessment. Geyser stock will now be replaced by Geyser-Marion.

Mammoth fell back a few points in sympathy with all other stocks a portion of whose output is silver. A favorable gold development is reported from the 800 level. Mercur closed strong and did business at firm prices, but showed signs of weakness in the middle of the week. Northern Light was fairly active and did business at 82 1/2c., closing a little stronger.

Omaha is a favorite among gold prospects and several blocks changed hands, despite the litigation that is retarding its development. In the absence of bids it is difficult to name a price on Ontario. The lowest posted offering for the stock is \$6, but if there were a market for it, it could undoubtedly be taken in for much less. The usual dividend of 10c. per share was not declared for July.

Sacramento became slightly weaker toward the close and was offered down. Sunbeam is attracting favorable notice, and the stock is enjoying some activity. In the general depression of the week, both Swansea and South Swansea came down, both being quoted lower, regardless of favorable conditions at the mines. Utah is not offered freely, but it is weak in company with other silver-leads.

San Francisco. July 31.

(From Our Special Correspondent.)

The market opened rather quietly and there seemed to be every prospect of a dull week, when matters were enlivened by the announcement of an important strike in the Sierra Nevada ground. It seems that a deposit of ore carrying \$40 or more in gold per ton had been cut in a drift some 450 ft. from the Layton tunnel. This news carried up Sierra Nevada stock with a jump and pulled up most of the rest of the list in sympathy with it. There was some heavy buying for a time, but matters soon quieted down again. It looks as if most of the purchases were simply made in hopes of realizing a quick profit, and investors are holding out to wait developments. The fact is that very little faith is put in these Comstock strikes nowadays.

The interest in Sierra Nevada continued quite lively, but the other stocks were weaker and showed very small transactions. Later in the week there was a decided reaction and the stock sold at a lower price. This was partly due to the taking of profits by parties who had bought the stock for a short turn. The other stocks were comparatively neglected.

Some closing quotations are: Sierra Nevada, \$1.50 @ \$1.55, Consolidated California & Virginia, \$1.35 @

\$1.40; Ophir, 77@80c.; Yellow Jacket, 51@55c.; Gould & Curry, 49@50c.; Savage, 33@34c.; Crown Point, 25@26c. There were some sales of Standard Consolidated at \$1.55, but no other business outside of the Comstocks.

On Wednesday the directors of the Sierra Nevada Mining Company held a meeting and took action regarding the admission of visitors to the mine. Since the recent strike of ore in the upper or Layton tunnel workings, there have been so many applicants for permission to inspect the new ore body, that were all the people admitted it would seriously retard the work in the mine. In view of this the directors deemed it best to fall back upon an old Nevada law providing for visiting days at the Comstock mines, and they passed a resolution at yesterday's meeting establishing two days in each month, the dates to be fixed by the superintendent, on which all persons entitled to inspect the mine will be given admission, and every facility to visit and examine points of interest.

The Crown Point Mining Company has levied an assessment of 10c. per share.

The delinquent sale of the Fox assessment on Hale & Norcross stock has been further postponed to August 14th.

The delinquency in office of the Grayson assessment on Hale & Norcross stock has been further postponed to September 28th, and the day of sale to October 18th.

The Tuolumne County Electric Power and Light Company has called a meeting of its stockholders for September 28th, to consider a proposition to create a bonded indebtedness of \$600,000.

The North San Juan Gold Mining Company, of Nevada County, has levied an assessment of 7c. per share, delinquent September 8th.

The Mexican Mining Company has levied an assessment of 20c. per share, delinquent September 1st.

The Sutro Railroad Company has re-elected the old management for 1897, with Adolph Sutro as president, Theodore Krauss, secretary, and E. M. Van Frank, superintendent.

The Virginia & Gold Hill Water Company has re-elected the old directors for 1897, with D. C. Bates as secretary.

London. July 27.

(From Our Special Correspondent.)

The actual amount of business done on the Stock Exchange is very small. Many men are away, and the remainder appear to have nothing to do. In spite of this suspension of business the general tone is strong and prices keep very firm.

The South African market has now every reason to be strong, as many of the disadvantageous circumstances have been removed. In the first place the parliamentary inquiry into the Jameson raid is over and the government has announced that they intend to forget all about it from henceforth, and that they have no intention of proceeding against Mr. Rhodes or anyone else. Then it is stated that the administration of the territory of the Chartered Company will be under imperial control, though the actual interference with the company and its policy will be very small. Thus the many uncertainties as to the future of Charterland and its pioneers are forever set at rest, and the city will know better how to proceed in the South African market.

Another important event bearing on the future of mining in South Africa is the publication of the report of the Commission on Mining in the Transvaal. As regards the dynamite question, it is proposed that the government should import explosives and disregard existing royalties, charging only an import duty of 20s. per case. Thus the cost to the mining companies would be reduced by 30s. a case, and dynamite by 25s. a case. This proposal is quite legal, as there is a clause in the dynamite concession which admits it. The commission really wished to recommend the total cancellation of the concession, but various legal difficulties stood in the way. The other question involved in the discussion, the railway rates, has also received the attention of the commission. It is recommended that the expropriation of the railways should take place at some period on the basis of the profits of three years, and that meanwhile in order to give immediate relief to the industry various reductions in rates are recommended so as to reduce the cost of transport by £500,000. Of course these are only suggestions by the commission, and are open to considerable revision, but there is considerable likelihood that they will be adopted; if so there are many mines which can be reopened, and others that are at present working at no profit will regain a more desirable position.

The event that has had most effect on the Exchange has been the announcement of an important discovery on the Summer & Jack East. The Main Reef has been struck unexpectedly at a depth of only 1,850 ft. and the north reef at 1,863 ft. It was calculated that the depth of strike would be 2,500 ft., so that the difference is considerable and shows a great flattening in the inclination of the reef. The cost of working will be greatly decreased, so that naturally the shares in the company have gone up. Some others have advanced in sympathy.

The West Australian market has been not quite dead, for there is some inquiry for shares in companies in the Kalgurlye District. The formation of the West Australian Market Trust by Mr. Bottomley has attracted attention, and many people knowing the vast ability of the promoter will put in their money. This company is in the nature of a promoting company and its nominal capital is £2,500,000, and it is in the nature of an enlargement of the Joint Stock

Institute. Mr. Bottomley made an immense amount of money in three years at this Institute, and no doubt he will make more. Of the money he made he gave away £250,000 to the poor shareholders in the Hansard Union, the great printing firm which came to grief four or five years ago. Mr. Bottomley was the promoter of the Hansard Union, and the blame for its failure was put on him until the courts cleared him of all responsibility, both legal and moral. Of course this gift was intended as an advertisement for himself, and people are asking where he got his money from in order to be so generous, and whether another batch of poor shareholders will not grow up some time in the future in consequence.

America has been somewhat to the fore in the city this week. The Klondike discoveries have set people talking, but very few London people will do more than make inquiries at present. The Yukon company that I mentioned some weeks ago, and the British Columbia Development Company, which is its sponsor, are interested in the discovery, as they are the controllers of the White Pass, which seems to be the only practicable way of going to the goldfield. They are intending to bring out a new company to exploit their possessions. The London & British Columbia Goldfields, Limited, have formed a new company called the Yukon Goldfields, Limited, with a capital of £100,000, with the object of sending their British Columbia agent, Mr. R. B. Wood, to Klondike to explore and secure claims. This company, the London & British Columbia Goldfields, Limited, was formed quite two years ago, when the province first received attention in London. So far it does not seem to have done much. It has secured certain claims, Ymir Group, in Wild Horse Creek, West Kootenay; Commonwealth Group, in Crawford Creek, Kootenay Lake; Ruth mines, adjoining the Slocan Star; Norfolk Claims, Boundary Creek, and Alma Group, adjoining Ymir. None of these has shown great results at present, and, of course, the new venture is extremely risky and over-capitalized.

Paris. July 25.

(From Our Special Correspondent.)

The mining stock market for the past week has shown little movement. It is the season of rest, and nothing has occurred to disturb it.

The Russian metallurgical group has perhaps been more prominent than any other. Nearly all of the stocks were in demand and their prices are high. The Briauks Company, it is said, will issue 10,000 new shares (4,000,000 fr.), the money to be used to build new works near Kertsch, where the company recently bought land. A new stock in this group is the Société Metallurgique de l'Oural-Volga. This is a French company, having a capital stock of 18,000,000 fr., in shares of 500 fr. each. The property includes iron mines and a blast furnace at Arziano-Petrovski, in the Oural; a forge, now in operation, at Innerskala-Datcha, also in the Oural, and property at Tsaritsin, on the Volga, where the company is now erecting steel works, a rolling mill and other works. The steel works will have 12 open-hearth furnaces. These works will use petroleum and *astalki*—residues from the Baku oil refineries—for fuel. The metallurgical industry in Russia is a growing one and the prospects of the new company are good. The first quotation on its stock is 615 fr.

The copper shares have been rather quiet, and the same may be said of the other metal companies.

The African gold stocks have shown some movement, but the market is a very uneven one, and varies in unexpected directions.

There is some discussion over the mismanagement which has brought some of the nitrate companies into a very bad position, and the subject is likely to be well ventilated.

We hear nothing in public about the new gold fields of Madagascar, but some careful examinations have been begun privately, and I believe we may hear from them later. If all I am told is true there are some rich mines to be found. At any rate one will not freeze to death there, as in that fabulous northern region of the Klondike, from which you are now sending us such wonderful tales. For my part I do not want to make myself one of the *Equimaux*—even for unlimited gold.

Rossland, B. C. July 27.

(From Our Special Correspondent.)

Within the last few days matters of grave importance affecting the mining industry of this district have been decided. There has been a pronounced advance of the smelter phase of the question. The decision of the Le Roi Company to erect their smelter at Northport and the beginning of preparations to erect reduction works for the treatment of low-grade ores by Mr. L. H. Webber's company mark an important advance.

There is some prospect, too, of another smelter being erected for the treatment of the War Eagle and Center Star ores, but this report is yet unconfirmed. The decision reached by the Le Roi and Mr. Webber's project has given a marked impetus to the camp, and the next few days will in all probability witness more activity in the mineral industry in Rossland than has been noticeable for some time. The outlook for the investment of a large amount of capital in legitimate mining and its kindred business of reducing the ores is now very promising.

MEETINGS.

Cactus Mining Company, special, at office of Marshall & Royle, Salt Lake City, Utah, August 14th, at 2 p. m.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Anchor, Argenta, etc., with columns for location, par value, and prices for various dates from July 31 to Aug 6.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Alamo, Anchor, Argenta, etc., with columns for location, par value, and prices for various dates from July 30 to Aug 6.

* Official quotations Boston Stock Exchange. * Bid and ask quotations. Total sales, 51,09, \$Ex-dividend.

BALTIMORE, MD.* Week ending Aug. 5.

Table of stock quotations for Baltimore, MD, listing companies like Atlantic Coal, Cleveland, etc., with columns for location, par value, bid, and ask prices.

* Official quotations Baltimore Stock Exchange.

CLEVELAND, O.*

Table of stock quotations for Cleveland, O, listing companies like Aurora, Chandler, etc., with columns for par value, bid, ask, and other prices.

* From our special correspondent.

ASPEN, COLO.

July 30.

Table of stock quotations for Aspen, Colo., listing companies like Agnes C, Alta Argent, etc., with columns for location, capitalization, par value, and quotations.

COLORADO SPRINGS, COLO.†

Table of stock quotations for Colorado Springs, Colo., listing companies like Alamo, Anaconda, etc., with columns for par value, bid, ask, and other prices.

* Official quotations Colo. Springs Mg. Stock Assoc. Total shares sold, 370,400.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing companies like American Coal, Col. C. & I. Dev., etc., with columns for par value and prices.

* Official quotations. New York Stock Exchange, mining, 3,500 shares; other stocks, 80,634 shares; Consolidated Stock and Petroleum Exchange, mining, 21,975 shares; Mining Exchange, 67,250 shares. Total shares sold, 173,359. * Bid and ask quotations.

PHILADELPHIA, PA.†

Table of stock quotations for Philadelphia, Pa., listing companies like Cambria Iron, Cho. & Gif. Cliffs, etc., with columns for location, par value, bid, ask, and other prices.

† Official quotations Philadelphia Stock Exchange. * Bid and asked quotations † Ex-div. Total sales, 9,387.

PITTSBURG, PA.* Week ending Aug. 4.

Table of stock quotations for Pittsburgh, Pa., listing companies like Allegheny, Carbondom, etc., with columns for location, par value, bid, ask, and other prices.

* Official quotations Pittsburgh Stock Exchange.

STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colorado, listing various companies and their prices for July 26, 27, 28, 29, 30, and 31. Includes columns for Name of Company, Par value, Bid, Ask, and Sales.

LOS ANGELES, CAL.

Table of stock quotations for Los Angeles, California, listing various companies and their prices for July 9, 21, 22, 23, and 24. Includes columns for Name of Company, Location, Par value, Bid, Ask, and Sales.

Official quotations, Los Angeles Mining and Stock Exchange. * Bid and ask quotations. Total sales, 399,600 shares.

SALT LAKE CITY, UTAH. Week ending July 31

Table of stock quotations for Salt Lake City, Utah, listing various companies and their prices for the week ending July 31. Includes columns for Stocks, Number of shares, Par value, Bid, Asked, Actual selling price, and Sales.

* From Our Special Correspondent. † Utah company. ‡ Mines in Vanderbilt, Cal. § Mines in Tuscorora, Nev.

ROSSLAND, BRITISH COLUMBIA. July 21.

Table of stock quotations for Rossland, British Columbia, listing various companies and their prices for July 21. Includes columns for Name of Company, No. of shares, Par value, Selling price, and Sales.

* From Our Special Correspondent.

BUTTE, MONT. July 16.

Table of stock quotations for Butte, Montana, listing various companies and their prices for July 16. Includes columns for Name of Company, Par value, Bid, Ask, and Sales.

HELENA, MONT. Week ending July 28.

Table of stock quotations for Helena, Montana, listing various companies and their prices for the week ending July 28. Includes columns for Name of Company, Location, Company's office, Par value, Bid, Asked, Shares sold, and Price.

* Special Report of Samuel K. Davis. Total shares sold, 5,900.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, California, listing various companies and their prices for July 30, 31, Aug 1, 2, 3, 4, and 5. Includes columns for Name of Company, Location, Par value, and Price.

* Official telegraphic quotations, San Francisco Stock Exchange.

MEXICO. Week ending July 28.

Table of stock quotations for Mexico, listing various companies and their prices for the week ending July 28. Includes columns for Name of Company, State, No. of shares, Last dividend, Last assessment, Opening, and Closing.

NOTE.—In most of the older Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Many newer companies have a nominal par value, usually \$5 or \$100. Prices are in Mexican dollars.

STOCK QUOTATIONS.

LONDON.

July 23

Table of stock quotations for London, listing company names, countries, authorized capital, par value, last dividend, and quotations (buyers/sellers).

PARIS.

Week ending July 22.

Table of stock quotations for Paris, listing company names, countries, products, capital stock, par value, and prices (opening/closing).

*From our special correspondent.

VALPARAISO, CHILE.*

June 19.

Table of stock quotations for Valparaiso, Chile, listing company names, locations, capital paid, share value, last dividend, and prices.

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

SHANGHAI, CHINA.*

July 2.

Table of stock quotations for Shanghai, China, listing company names, countries, no. of shares, par value, paid up, last dividend, and price.

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

DIVIDENDS.

Table of dividends for various companies, listing company names, current dividends, paid since Jan 1, 1897, and total to date.

ASSESSMENTS.

Table of assessments for various companies, listing company names, locations, no. of shares, date, and amount.

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

* New assessment.

RARE ELEMENTS, CHEMICALS AND MINERALS—CURRENT PRICES.

NOTE.—This table is revised up to July 12th. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.

CHEMICALS AND MINERALS.

These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts.

Table listing various chemicals and minerals such as Abrasives, Acids, Alcohols, Alum, Aluminum, Ammonia, Ammonium, Antimony, Argols, Arsenic, Asbestos, Asphaltum, Barium, Barytes, Bauxite, Benzole, Bismuth, Bone Ash, Borax, Bromine, Cadmium, Calcium, Cement, China Clay, Chlorine, Chrome Ore, Cobalt, Copper, Explosives, Feldspar, Flint, Fluorspar, Fuller's Earth, Gypsum, Iodine, Iron, Kaolin, Kroyolith, Lead, Lime, Magnesium, Manganese, Marble Dust, Mercury, Mica, Mineral Wool, Nickel, Oils, Mineral, Ozokerite, Paints, Paraffine, Petroleum, Sulphur, Tar, Zinc, and various salts.

Table listing various oils, minerals, and other materials with columns for 'Cust. Meas.' and 'Price'. Includes items like Oils, Mineral, Paraffine, Petroleum, Sulphur, Tar, Zinc, and various salts.

Table listing various salts and other materials with columns for 'Cust. Meas.' and 'Price'. Includes items like Salt, Domestic, Lump, Liverpool, Fine, Salt peter, Silica, Sodium, Acetate, Benzoin, Bromide, Carbonate, Chlorate, Cyanide, Hyposulphite, Molybdate, Nitrate, Oxalate, Phosphate, Silicate, Sulphate, Tartrate, Tungstate, Uranium, Vanadium, Zinc, and various other salts.

Table listing various rare elements and their prices. Includes items like Argon, Barium, Beryllium, Boron, Calcium, Cerium, Chromium, Cesium, Cobalt, Didymium, Erbium, Gallium, Germanium, Glucinum, Helium, Iridium, Lanthanum, Lithium, Molybdenum, Niobium, Osmium, Rhodium, Rutherfordium, Selenium, Silicon, Strontium, Tantalum, Thallium, Thorium, Titanium, Vanadium, and Zirconium.

ALPHABETICAL INDEX TO ADVERTISERS.

(-) Indicates every other week or monthly advertisements.

Table with columns A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z. Each column lists advertiser names and their corresponding page numbers.

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Bakers and Brokers.
 Bennett, Wm. & Co.
 Bonbright, W. P. & Co.
 Breitung, E. N.
 Brown Bros. & Co.
 Dignowty & Co. C. L.
 Gran, C. H. & Co.
 Goldsmith Bros.
 Hanby & Harman.
 Hedburg, Eric.

Belting.
 Detroit Sprocket Chain Co.
 Hewitt & Gutoff Mfg. Co.
 Jeffrey Mfg. Co.
 New York Belting & Packing Co., Ltd.
 Pease, F. L., & Co.

Belt Lacing.
 Bristol Co.

Blasting Caps.
 Metallic Cap Mfg. Co.

Blasting Batteries, Caps and Fuse.
 Climax Fuse Co.
 Macbeth, James & Co.
 Metallic Cap Mfg. Co.

Boiler, Compound.
 Parsons, J. H., Chemical Co.

Boilers.
 Denver Eng. Wks. Co.
 Fairbanks, Morse & Co.
 Fraser & Chalmers.
 Poock, Wm. B. & Co.
 Billin, Chas. E. & Co.
 (See Machinery.)

Brattice Cloth.
 Besly, Chas. H., & Co.

Brick Machinery.
 Freese, E. H., & Co.

Bridges.
 Berlin Iron Bridge Co.
 Gillette-Herzog Mfg. Co.
 (See Machinery.)

Brimstone Apparatus.
 White, Edw. F.

Carbons.
 New York Diamond Drill Co.
 Lexow, Theodor.

Chain and Link Belting (See Belting.)

Chemical Engineers.
 Dunbar, R., & Son.

Chemicals.
 Baker & Adamson.
 Bullock & Crenshaw.
 Rimer & Amend.
 Fair Drug & Assay Supply Co.
 Fuerst Bros. & Co.
 Henry Hill Chem. Co.
 Western Chemical Co.

Chemical Plumbers.
 Vollmer & Beaton.

Coal.
 Maryland White Coal Mfg. Co.
 Potts, F. A., & Co.
 Stickney, Conyngham & Co.
 Ward & Olyphant.

Coal Cutters (See Machinery.)

Coal Washers (See Machinery.)

Coal Washing Machinery.
 Cunnigham & Co.
 Jeffrey Mfg. Co.

Compressed Air Shop Tools.
 Clayton Air Compressor Works.

Compressors.
 Clayton Air Compressor Works.
 Ingersoll-Sergeant Drill Co.
 Laidlaw-Dunn-Gordon Co.
 Norwalk Iron Works Co.
 Rand Drill Co.

Concentrators, Crushers, Pulverizers, Separators, Etc.
 Ails Co., Ed. F.
 Blake, Theo. A.
 Bradley Pulverizer Co.
 Colorado Iron Works.
 Denver Eng. Works Co.
 Fraser & Chalmers.
 Fair Game Concentrator.
 Gates Iron Works.
 Hewitt & Gutoff Mfg. Co.
 Krupp, F.
 Link Belt Machinery Co.
 McCully, R.
 Raymond Bros. Impact Pulv. Co.
 Steam Foundry & Mach. Co.
 Walburn-Swenson Co.
 (See Machinery.)

Contractors (See Machinery.)

Conveying Belts.
 Robins Conveying Belt Co.

Copper and Lead Producers.
 American Metal Co.
 Arizona Copper Co.
 Atlantic Mining Co.
 Balbach S. & Ref. Co.
 Baltimore Cop. Wks.
 Bath, H., & Son.
 Bridgeport Copper Co.

Canadian Copper Co.
 Copper Queen Mfg. Co.
 Detroit Cop'r Mfg. Co.
 Corrugated Iron
 Berlin Iron Bridge Co.
 Crucibles, Graphite, Etc.
 Baker & Co.
 Denver Fire Clay Co.
 Dixon, Jos. Crucible Co.
 Garden City Sand Co.
 Cyanide.
 Fuerst Bros. & Co.
 Rosser & Hasslacher Chemical Co.
 Cyanide Potash.
 Fuerst Bros. & Co.
 Gas Light & Coke Co.
 Rosser & Hasslacher Chem. Co.
 Schenck, Hartford & MacLagan.
 Williams Mfg. Co.

Diamonds.
 Lexow, Theodor.

Diamond Drills.
 American Diamond Rock Drill Co.
 Bull. & Co., Mfg. Co.
 Lexow, Theodor.
 Sullivan Machinery Co.
 (See Air Compressors and Rock Drills.)

Draughtsmen.
 Young, Wm. M.

Drugs and Materials.
 Altender Theo. & Son
 Besly, Chas. H., & Co.
 Buff & Berger.
 Gurly, W. & L. E.
 Heer, Peter.
 (See Engineering Instruments.)

Dredges.
 Bucyrus Steam Shovel & Dredge Co.
 Marion Steam Shovel Co.

Dyers.
 Brown, Horace F.
 Cummers, Son Co.
 Denver Eng. Wks. Co.
 Dunbar, R., & Son.

Dump Cars.
 Denver Eng. Works Co.
 Hendrie & Bolthoff Mfg. Co.

Excavators.
 Brown, Horace F.
 Cummers, Son Co.
 Denver Eng. Works Co.
 Hendrie & Bolthoff Mfg. Co.

Educational Institutions.
 Arizona School of Mines.
 Chicago School of Assaying.
 Columbia University.
 Columbian University.
 International Correspondence School.
 Lehigh University.
 Mass. Inst. of Technology.
 Michigan Mining School.
 Royal Mining Academy.
 University of Arizona.

Electrical Batteries.
 Macbeth, James & Co.

Electrical Machinery and Supplies.
 American Engine Co.
 Besly, Chas. H., & Co.
 Denver Eng. Wks. Co.
 Detroit Sprocket Chain Co.
 Jeffrey Mfg. Co.
 Link Belt Mach. Co.

Elevators, Conveyors and Hoisting Machines.
 Brown, Horace F. & Co.
 Hunt, C. W., Co.
 Jeffrey Mfg. Co.
 Lambert Hoisting Eng. Co.
 Link Belt Mach. Co.
 Nelsonville Foundry & Mach. Co.
 Roberts Mfg. Co.
 Vulcan Iron Works.
 (See Wire Rope Tramway and Machinery.)

Emery Wheels.
 Besly, Chas. H., & Co.
 New York Belting & Packing Co., Ltd.

Engineers, Architects, Surveyors.
 See Directory Pages 1, 5 and 6.

Engineers' Instruments and Supplies.
 Bradford, E. Sons & Co.
 Buff & Berger.
 Bullock & Crenshaw.
 Faith & Co.
 Gurly, W. & L. E.

Engines.
 Bullock, M. C. Mfg. Co.
 Fairbanks, Morse & Co.
 Fraser & Chalmers.
 Lambert Hoisting Eng. Co.
 Lagerwood Mfg. Co.
 Philadelphia Eng. Works, Ltd.
 (See Machinery.)

Excavators.
 Bucyrus Steam Shovel & Dredge Co.
 Marion Steam Shovel Co.
 Vulcan Iron Works.

Fire-Brick and Clay.
 Chur, Walter.
 Denver Fire Clay Co.
 Garden City Sand Co.
 Standard Fire Brick Co.

Flourishers.
 Fuerst Bros. & Co.

Furnaces.
 Billin, Chas. E. & Co.
 Brown, Horace F.
 Denver Fire Clay Co.
 Sargent & Co., E. H.

Fuses.
 Ingersoll-Sergeant Drill Co.
 Macbeth & Co.

Gas Engines.
 Hercules Gas Engine Works
 Union Gas Engine Co.

Gas Works.
 Pollock, Wm. B. & Co. | Wood, R. D.

Gauges, Recording, etc.
 Bristol Co.

Genies.
 Besly, Chas. H., & Co. | Denver Eng. Wks. Co.
 Chester Steel Cast. Co. | Fraser & Chalmers.
 (See Machinery.)

Grease, Graphite, Etc.
 Besly, Chas. H., & Co. | Fuerst Bros. & Co.

Heavy Machinery.
 Denver Eng. Works Co.
 Fraser & Chalmers.

Hose, Rubber, Etc.
 New York Belting & Packing Co., Ltd.

Hydraulic Rams.
 Power Specialty Co.

Injectors.
 Jenkins Bros.
 Lunkenselmer Co.

Insulated Wires and Cables.
 Okonite Co., Ltd.

Insurance Companies.
 Hartford Steam Boiler Inspect'n and Ins Co.
 Mutual Life Insurance Co.
 Iron Ore.
 Spanish American Iron Co.
 Lead Runners.
 Vollmer & Beaton.

Lead Linings for Chlorination Tubs.
 Raymond Lead Co.

Link Belting. (See Belting.)

Locomotives.
 General Electric Co.
 Hunt, C. W., Co.
 Mount, H. K., & Co.

Lubricators.
 Detroit Lubricator Co.
 Lunkenselmer Co.

Machinery.
Dealers in Mining, Milling and Other Machinery.
 Allis, Edw. P., & Co.
 American Diamond Rock Drill Co.
 Bacon, E. C.
 Besly, Chas. H., & Co.
 Billin, Chas. E. & Co.
 Blake, T. A.
 Bradley Pulverizer Co.
 Bullock, M. C. Mfg. Co.
 Caldwell, H. W., & Co.
 Colorado Iron Works.
 Cuninghame & Co.
 Denver Eng. Wks. Co.
 Fairbanks, Morse & Co.
 Fraser & Chalmers.
 Gates Iron Works.
 Gillette-Herzog Mfg. Co.
 Hammond, Mfg. Co.
 Hendrie & Bolthoff Mfg. Co.
 Ingersoll-Sergeant Drill Co.
 Jeffrey Mfg. Co.
 Jessop, Wm. & Son, Ltd.
 King & Andrews Co.
 Lambert Hoisting Eng. Co.
 Lagerwood Mfg. Co.
 Krupp, F.
 McCully, R.
 Montgomery, J. H.
 Nebraska Foundry & Machine Co.
 New York Diamond Drill Co.
 Norwalk Iron Works Co.
 Philadelphia Eng. Wks. Co.
 Pollock, Wm. B. & Co.
 Rand Drill Co.
 Raymond Bros. Impact Pulv. Co.
 Roberts Mfg. Co.
 Sargent Iron Works.
 Semi-Steel Co.
 Steam Foundry & Mach. Co.
 Snow Steam Pump Co.
 Stearns-Roger Mfg. Co.
 Sullivan Machinery Co.
 Tod, Wm., & Co.
 Union Gas Engine Co.
 Vulcan Iron Works.
 Vollmer & Beaton.
 Walburn-Swenson Co.
 Westinghouse Elec. Mfg. Co.
 Williams Mfg. Co.

Manganese Steel.
 Taylor Iron & Steel Co.

Metal Dealers.
 American Dev. & Mfg. Co.
 American Metal Co.
 Denver Lead Co.
 Baker & Co.
 Bath, Henry & Son.
 Besly, Chas. H., & Co.
 Bridgeport Copper Co.
 Gillette-Herzog Mfg. Co.
 Kureka Co.
 Johnson, Matthey & Co.
 Lambert's Wharf Co.
 Lawson Bros.

Matheson Smelting Co.
 Mathiessen & Hegeier Zinc Co.
 Montana Ore Purchasing Co.
 Orford Copper Co.
 Pass, C., & Son, Ltd.
 Phelps, Dodge & Co.
 Fisher Lead Co.
 Raymond Lead Co.
 Spaulding American Iron Co.
 Tod, William, & Co.
 Vivian, Y'nger & Bond.

Metallurgical Works and Ore Processors' Processes.
 American Dev. & Mfg. Co.
 Am. Zinc Lead Co.
 Baker & Co.
 Balbach S. & Ref. Co.
 Baltimore Copper Wks.
 Bridgeport Copper Co.
 Canadian Copper Co.
 Con. Kas. City S. & R. Co.
 Denver Eng. Wks. Co.
 Elliott's Metal Co., Ltd.

Mine Cars.
 Denver Eng. Wks. Co.
 Fairbanks, Morse & Co.
 Hendrie & Bolthoff Mfg. Co.
 Hunt, C. W., Co.
 Nelsonville Foundry & Machine Co.
 (See Machinery.)

Mine Mill and Smelters' Supplies.
 Cuninghame & Co.
 Denver Eng. Wks. Co.
 Gates Iron Works.
 Rosser & Hasslacher Chemical Co.
 (See Machinery.)

Mining and Land Transactions.
 American Dev. & Mfg. Co.
 Detroit Copper Mfg. Co.
 Kureka Co.
 Isabella Gold Mfg. Co.
 Into Copper Co.
 Smuggler-Union Mfg. Co.

Nickel.
 Canadian Copper Co.
 Orford Copper Co.

Ore Cars.
 Gillette & Herzog.

Ore Crushers.
 Brown, Horace F.
 Cuninghame & Co.
 Dunbar, R., & Son.

Ore Testing Works.
 Hunt, F. F.
 Ledoux & Co.
 Montana Ore Purchasing Co.
 (See Machinery.)

Packing and Pipe Coverings.
 Bradford, Randolph.
 Jenkins Bros.
 Robertson, J. L. & Son.

Perforated Metals.
 Aitchison, R., Perf. Metal Co.
 Fraser & Chalmers.
 Harrington & King Perforating Co.

Peroxide of Sodium.
 Rosser & Hasslacher Chemical Co.

Phosphor-Bronze.
 Phosphor-bronze Smelting Co.

Pile Drivers.
 Bucyrus Steam Shovel and Dredge Co.
 Ingersoll-Sergeant Drill Co.

Planes.
 Billin, Chas. E. & Co.
 Fairbanks, Morse & Co.
 Fraser & Chalmers.
 Power Specialty Co.
 Wyckoff, A., & Sons.

Platinum.
 Baker & Co.
 Johnson, Matthey & Co.

Plumbago (See Graphite.)

Powder.
 Atlantic Dynamite Co.
 Ingersoll-Sergeant Drill Co.

Projections.
 American Fertilizer.
 American Fertilizer.
 British Columbia Mining Record.

Refining.
 Irwin & C. Trade Review.
 McNeill's Code.
 Mining Investor.
 Mining Journal.
 Scientific Pub. Co.

Denver Republican.
 El Minerio Mexicano.
 Fumpe.
 Billin, Chas. E. & Co.
 O. A. S., Steam Pump Works.
 Clayton Air Com. Wks.
 Denver Eng. Wks. Co.
 Fairbanks, Morse & Co.

Pyrites.
 Fuerst Bros. & Co.

Quarrying Machines.
 Ingersoll-Sergeant Drill Co.
 Rand Drill Co.

Sullivan Machinery Co.

Quicksilver.
 Euron Co.

Railroads.
 Aitchison, Topeka & Santa Fe Ry.
 Chicago & N. West. R. R.
 C. B. & Quincy R. R.
 C. C. & St. L.
 Denver & Rio Grande R. R.
 Denver, Leadville & Gunnison Ry.
 Florence & Cripple Creek R. R.
 Illinois Central R. R.
 Highland R. R. of Kentucky.
 Rio Grande Southern R. R.
 Southern R. R.
 U. P. D. & G. R. R.

Railroad Supplies and Equipments.
 Hunt, C. W., Co.
 Forster, H. K., & Co.
 (See Machinery.)

Regulators, Dampers, Heat, Etc.
 Eddy Valve Co.
 Jenkins Bros.

Rock Drills. (See Air Compressors.)

Roasting.
 Berlin Iron Bridge Co.
 Phelps, Dodge & Co.

Rubber Goods.
 New York Belting & Packing Co., Ltd.

Scales.
 Fairbanks, Morse & Co.
 Sorensen.
 Aitchison, R., Perf. Metal Co.
 Denver Eng. Wks. Co.
 Fraser & Chalmers.
 Gates Iron Works.
 Harrington & King Perforating Co.
 Link Belt Machinery Co.
 Luntow-Saylor Wire Co. (See Machinery)
 Tyler, W. S., Wire Works Co.

Seamless Pipe.
 McCluskey Bros.
 Robertson, J. L. & Son.

Shoes and Dies. (Denver Eng. Wks. Co.)
 Chester Steel Cast. Co.
 Curran Bros. Works.
 Crescent Steel Co.
 Eucyrus Co.
 Marion Steam Shovel Co.

Smelting and Refining Works.
 Balbach S. & Ref. Co. | Matheson Smelting Co.
 Baltimore Cop'r Wks. | Orford Copper Co.
 Bridgeport Copper Co. | Penna. Salt Mfg. Co.
 Con. Kas. City S. & R. Co. | Penn. Smelting and Refining Works.
 Elliott's Metal Co., Ltd. | Phosphor Bronze Smelting Co.
 Gillette-Herzog Mfg. Co.

Sprocket Wheels.
 Detroit Sprocket Chain Co.

Steel Rails, Castings, Rolls, Drill Steel.
 Bethlehem Iron Co.
 Chester Steel Cast. Co.
 Curran Bros. Works.
 Crescent Steel Co.
 Jessop Wm. & Son Ltd.
 (See Metal Dealers.)

Sulphur Apparatus.
 White, Edward F.

Tanks.
 Billin, Chas. E. & Co.
 Denver Eng. Wks. Co.
 Fairbanks, Morse & Co.
 Gates Iron Works.
 Williams Mfg. Co.

Telegraph Wires and Cables.
 Okonite Co., Ltd.

Tools.
 Besly, Chas. H., & Co.
 Pratt & Whitney Co.

Tubes.
 Besly, Chas. H., & Co. | Pollock, Wm. B. & Co.
 Williams Bros.

Tabling-Rubber.
 New York Belting and Packing Co., Ltd.

Turbine Water-Wheels.
 American Impulse Wheel Co.
 Leffel, Jas., & Co.
 Pelton Water Wheel Co.
 Stillwell-Bierce & Smith-Valle Co.

Valves.
 Eddy Valve Co.
 Fairbanks, Morse & Co.
 Jenkins Bros.
 Lunkenselmer Co.
 Powell, Wm., Co.

Ventilators.
 Bullock, M. C. Mfg. Co. | Tod, Wm., & Co.
 Fraser & Chalmers.

Voltmeters.
 Weston Electrical Instrument Co.

Vulcanite Emery Wheels.
 New York Belting and Packing Co., Ltd.

Water-Wheels.
 American Impulse Wheel Co.
 Leffel, James, & Co.
 Pelton Water Wheel Co.
 Stillwell-Bierce & Smith-Valle Co.

Well Drilling Machinery.
 Sullivan Mach'y Co. | Williams Bros.

Wharfage.
 Lambert's Wharfage Co.

Wheels, Car.
 Chester Steel Cast. Co.
 Taylor Iron & Steel Co.

Wire Cloth.
 Aitchison, R., Perf. Metal Co.
 Harrington & King Perforating Co.
 Tyler, W. S., Wire Works Co.

Windmills.
 Fairbanks, Morse & Co.

Wire Rope and Wire.
 Besly, Chas. H., & Co.
 Broderick & Bascom.
 Rope Co.
 California Wire Wks.
 Cooper Hewitt & Co.
 Hunt, C. W., Co.

Wire Rope Tramway.
 Roebbling, J. A., Son & Co.
 Ropeway Syndicate.
 Colorado Iron Works.
 Denver Eng. Wks. Co.
 Fraser & Chalmers.
 Hunt, C. W., Co.

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.

1535 WANTED—MILL SUPERINTENDENT for Peru; must fully understand the amalgamation of silver ores by the latest processes. House rent and table board furnished free. State experience, salary desired and references. Address PERU, ENGINEERING AND MINING JOURNAL.

1536 WANTED—AN ASSAYER AND CHEMIST for the City of Mexico; preferably one having had experience in Western smelter practice. Salary \$150 Mexican currency per month. Address, stating age, experience and references, PUENTE, ENGINEERING AND MINING JOURNAL.

1537 WANTED—A MINING ENGINEER experienced in silver mining and graduate of a technical school, to go to Peru; must have best references as to competency and reliability, and good knowledge of Spanish language. Address, stating salary expected, etc. LIMA, ENGINEERING AND MINING JOURNAL.

1538 WANTED.—A FIRST-CLASS SURVEYOR; also a chemist and assayer for a large mill and cyaniding plant. State qualifications, recommendations and salary expected. Address C., ENGINEERING AND MINING JOURNAL.

1539 WANTED—COMPETENT ASSAYER AND Refiner for Jewelry Factory at Seat le, Washington. One who is ready to go without delay for good pay. Address SEATTLE, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

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

A MAN, 27 YEARS OLD, WITH TECHNICAL education, previously assistant chemist at a large smelter and now with a consulting engineer, desires a position in the fall with a milling, smelting or refining company. Good references. Address C. D., ENGINEERING AND MINING JOURNAL. No. 18,040, Aug. 14.

WANTED BY MINING ENGINEER POSITION as superintendent of mine or mill; fully competent to take charge of iron, silver and gold mine, and understands steam and electric mining machinery; has had similar position, and is familiar with handling men; fine recommendations. Address No. 3a, ENGINEERING AND MINING JOURNAL. No. 18,059, Aug. 14.

CHEMIST—LEHIGH UNIVERSITY GRADUATE wants position as Chemist. Some experience. Best of references furnished. Address A. C., ENGINEERING AND MINING JOURNAL. No. 18,064, Aug. 21.

A MINING ENGINEER 26 YEARS OF AGE, now under engagement with well-known mining company, desires change; has been continuously employed for past five years in every capacity; thorough assayer and chemist. Address MINING, ENGINEERING AND MINING JOURNAL. No. 18,030, Aug. 14.

GRADUATE OF UNIVERSITY OF NORTH CAROLINA, 27 years old, wants position as chemist or assayer or as assistant in smelting works; Northwest preferred; hard worker; best of references. Address EARNST, ENGINEERING AND MINING JOURNAL. No. 18,063, Aug. 14.

ENGINEER, GERMAN, QUICK DRAUGHTS- man, 26½, with 10 years' experience in general engineering, wants employment temporarily, steadily or at home. Address F. L., ENGINEERING AND MINING JOURNAL. No. 18,064, Aug. 21.

CHEMIST, THOROUGHLY COMPETENT and practical experience in analytical, electrolytical and experimental work, wants position; best references furnished; salary moderate. Address O. K., ENGINEERING AND MINING JOURNAL. No. 18,062, Aug. 21.

\$7,800 GIVEN AWAY TO PERSONS making the greatest number of words out of the phrase "Patent Attorney Wedgerburn." For full particulars write the National Recorder, Washington, D. C., for sample copy containing same.

CONTRACTS OPEN.

DREDGING.—U. S. Engineer Office, Rock Island, Ill.—Sealed proposals, in duplicate, will be received here until 11 a. m., September 7th, 1897, and then publicly opened, for dredging in Galena River. Information furnished on application.

DREDGING PLANT.—United States Engineer Office, Chattanooga, Tenn.—Sealed proposals for hire of dredging plant will be received here until noon, Tuesday, August 31st, 1897, and then publicly opened. Information furnished on application.

ARTESIAN WELLS.—Sealed proposals will be received at the Mayor's office, Scranton, Miss., until 12 o'clock, noon, August 18th, 1897, for sinking and furnishing materials for a 6-in. artesian well, which will probably be about 500 ft. deep. No bid will be considered unless accompanied by cash or certified check payable to the order of the Treasurer of the town of Scranton, Miss., for 2% of the amount of the bid, to insure good faith and to be forfeited to the town of Scranton if the bidder fails to enter into a contract and file a satisfactory bond within five days after notice has been given that he has been awarded the contract. Specifications may be obtained by addressing J. D. Clark, Mayor, pro tem., Scranton, Miss., to whom all proposals or other communications are to be addressed. Bids must state fully and clearly therein just how the bidder proposes to finish the well on the bottom. The right to reject any or all bids is reserved.

WATER-WORKS.—Sealed bids will be received at the office of the Secretary of the Committee on Improvement of the Water-Works of the city of Newbern, Tenn., until 2 o'clock p. m., on Monday the 23d day of August, 1897, to furnish the necessary material, etc., and to erect and install the following: 1,300 ft. (approx.) of 8 in. cast-iron water pipe; 1,300 ft. (approx.) of 6-in. cast-iron water pipe; 7,200 ft. (approx.) of 4-in. cast-iron water pipe; 2½ tons of hub and spigot special castings; half ton of flanged special castings; two 8-in. gates; two 6-in. gates; eight 4-in. gates; 12 gate boxes; 22 fire hydrants; one 8-in. tubular well; one 65,000-gal. steel tank, and 5½-ft. steel tower. All in accordance with the plans and specifications on file in my office. Each bid must be accompanied with a certified check for \$250. The Committee reserves the right to reject any and all bids.

PUMPING ENGINE.—Sealed proposals will be received by the Department of Public Works, City of Chicago, until 11 a. m., Monday, September 6th, 1897, for furnishing and erecting on the foundations to be constructed at the Sixty-eighth street pumping station in the city of Chicago, one horizontal compound condensing pumping engine of fourteen (14) million gallons capacity per 24 hours, with a total lift of one hundred and fifty (150) feet, together with necessary boilers and all accessories and appurtenances, according to plans and specifications on file in the office of the Department of Public Works of said city.

Proposals must be made upon blanks furnished at said office and be addressed to said Department, endorsed "Proposals for New Pumping Engine for Sixty-Eighth Street Pumping Station," and be accompanied with five thousand (\$5,000) dollars in money or a certified check for the same amount on some responsible bank doing business in the city of Chicago, and made payable to the order of the Commissioner of Public Works. The Commissioner of Public Works reserves the right to reject any or all bids. Due consideration will be given to general merits of design, durability of construction, economy of operation and maintenance, facility for repairs and proved performance and record of similar works in actual service elsewhere. No proposal will be considered unless the party offering it shall furnish evidence satisfactory to the Commissioner of Public Works of his ability, and that he has the necessary facilities, together with sufficient pecuniary resources to fulfill the conditions of the contract and specifications provided such contract should be awarded to him. Companies or firms bidding will give the individual names as well as the name of the firm with their address.

SEWERS.—Sealed proposals will be received by the Township Committee of the Township of Bloomfield, Essex County, N. J., at the office of the Township Clerk, in said township, until August 16th, 1897, at 4:30 p. m., for the furnishing of all labor and materials and doing all the work according to plans and specifications prepared by the Sewer Engineer for the construction of about 3,000 ft. of 12 or 15-in. sewer in Newark Ave. and Harrison St. The following are the approximate quantities: 3,000 ft. 12-in. salt-glazed vit. sewer pipe, or 3,000 ft. 15-in. salt-glazed vit. sewer pipe, or 200 ft. 12-in. diameter iron pipe, or 200 ft. 15-in. diameter iron pipe, or 120 Y-branches on 12-in. pipe, or 120 Y-branches on 15-in. pipe; 10 manholes; 1,200 ft. 6-in. risers; 120 double Y-junction iron riser tops. Specifications, plans and profiles for the above work may be seen at the office of the Sewer Engineer, A. H. Olmsted, 25 Broad St., Bloomfield, N. J.

ARTESIAN WELL.—Sealed bids will be received at the office of the Village Clerk of the village of Melrose Park (Lake street and Eleventh avenue), Cook County, Ill., until 7 o'clock p. m., Friday, August 20th, 1897, for constructing and the furnishing of all materials for an artesian well. Specifications for said well may be obtained from said Village Clerk. Said bids must be in duplicate, the original addressed to said Village Clerk; must contain a certified check on some known responsible bank for \$300, and the duplicate must be addressed to the President of the village of Melrose Park. The successful bidder will be required to furnish bonds for the faithful and prompt performance of the contract. The President and Board of Trustees of the village of Melrose Park reserve the right to reject any or all bids. Payment for said well will be in cash on completion and acceptance thereof.

SUBWAY.—Sealed bids for building Section 11 of the Subway will be received at the office of the Transit Commission, 20 Beacon street, Boston, Mass., till 12 o'clock m. of Thursday, September 2d, 1897. Each bid must be accompanied by a certified check for the sum of \$2,500. The section is under and near the site of the old Boston & Maine station at Haymarket Square. A portion of the subway will be an open incline, and the remaining portion will be covered. The structure will consist of a combination of steel and masonry. Some of the items are estimated to be as follows: 19,300 cu. yds. earth excavation; 330 tons iron and steel, furnished by the Commission, to be set in place; 7,000 cu. yds. concrete and brick masonry; 22,000 lin. ft. of piles in place. Plans can be seen and specifications and forms of contract can be obtained at 20 Beacon street, fifth floor. A bond will be required for the faithful performance of the contract in a sum of 20% of the amount. The Commission reserves the right to reject any and all bids and reserves the right to award the contract as it deems for the best interest of the city of Boston.

STEEL WATER-TOWER.—Sealed bids will be received by the Board of Trustees for the water-works and improvement bonds of the city of Jacksonville, Fla., until 3 p. m., Tuesday, September 7th, 1897, for furnishing all materials and erecting complete on foundations a steel water-tower. Tower to be 100 ft. in height above foundations; the tank on tower to be 30 ft. in diameter and 45 ft. in height, with conical bottom and roof. With bid must be submitted a certified bank check, in the sum of one thousand dollars, payable to the chairman of the Board. Specifications can be had and plans seen at the office of the Board. For further information apply to R. N. ELLIS, C. E., Superintendent. The Board reserves the right to reject any or all bids. Informal bids will not be received.

GASOLINE LIGHTING.—Sealed proposals will be received by the City of Sioux City, Ia., at the office of the city clerk, up to 8 o'clock p. m., Tuesday, August 17th, for the furnishing and lighting of 300 or more gasoline street lamps in the streets and alleys of Sioux City, Ia. Proposals to be for furnishing and lighting said lamps for the following periods, to wit: For one year, for two years, or for three years, respectively. All bids must be accompanied by a certified check in the sum of \$1,000 as a guarantee that the successful bidder will enter into a contract and give a good and sufficient bond, to be fixed and approved by the City Council, for the faithful performance of said contract. The City Council reserves the right to reject any or all bids.

ELECTRIC LIGHTS.—Sealed proposals will be received at the City Clerk's Office, Greenfield, Ind., up to and including August 18th, 1897, for the lighting of said city with 60 or more arc lights of 2,000 C. P., for one, two, three, five and ten years. Bids to be made on moon schedule, midnight and all night, and per lamp. City reserves the right to reject any and all bids. Estimated population of said city, 6,000.

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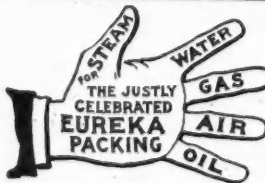
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COLORADO SPRINGS, COLO., June 10, 1897.

DIVIDEND NO. 11.

A dividend of ONE-HALF CENT PER SHARE (\$11,250) has been declared, payable June 25th, 1897, to stockholders of record June 15th, 1897.

The stock transfer books will be closed June 15th, 1897, at 3 o'clock p. m., and will be reopened on the morning of June 26th, 1897.

PERCY HAGERMAN,
Vice-President and Treasurer.

ASSESSMENTS.

CONSOLIDATED CALIFORNIA AND VIRGINIA MINING COMPANY.—Location of principal place of business, San Francisco, Cal.; location of works, Virginia Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 3d day of August, 1897, an assessment (No. 9) of TWENTY-FIVE CENTS (25c.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the 8th day of September, 1897, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the 29th day of September, 1897, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, A. W. HAVENS, Secretary. Office: Room 29, Nevada block, 309 Montgomery street, San Francisco, Cal.

CONTRACTS OPEN.

Continued from Page 20.

ELECTRIC LIGHTS.—Sealed proposals will be received by City Clerk of City of Greenfield, Indiana, until the 18th day of August, 1897, for the lighting of said city with sixty or more arc lights of 2,000 candle power, for one, two, three, five and ten years. Bids to be made on moon schedule, midnight, and all night, and per lamp. City reserves the right to reject and all bids. Estimated population of said city, 6,000.

LEVEE—U. S. Engineer Office, 99 Madison St., Memphis, Tenn.—Sealed proposals for closing crevasses, enlarging and repairing levees in Lower St. Francis, White River and Upper Yazoo Levee Districts will be received here until 12 o'clock noon, August 16, 1897, and then publicly opened. Information on application.

BREAKWATER.—U. S. Engineer's Office, Duluth, Minn.—Sealed proposals for building two breakwater piers, each some 2,700 ft. long, at Lake Superior entrance to Portage Lake Ship Canals, Mich., will be received here until noon, September 10th, 1897, and then publicly opened. Information furnished on application.

RIP RAP WALL.—United States Engineer Office, Army Building, New York.—Sealed proposals, in triplicate, for construction of riprap wall on eastern beach of Sandy Hook, N. J., will be received here until 12 m., August 25th, 1897, and then publicly opened. Information furnished on application.

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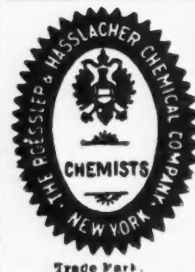
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