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The purchase of the stock of the Metropolitan Iron and Land Company which is announced this week, gives the Carnegie Steel Company the control of a sufficient supply of hard ore for its blast furnaces, and supplements the purchase made last year of mines on the Mesabi Range. The Carnegie Company now owns mines which will furnish it with all the ore needed for years to come, has a long contract for transportation from the Lake Superior shipping ports to Lake Erie, and owns a railroad from the port of delivery to its works. It has its supply of raw material completely under its own control, with facilities for mining and transporting it at the lowest possible cost.

The mines just bought are the Norrie and the Tilden, the two most extensive on the Gogebic Range. Neither was very actively worked last year, but the Norrie has shipped as much as 985,000 tons in one season, and the Tilden has exceeded 400,000 tons. Both yield ore which is below the Bessemer limit in phosphorus; indeed, Norrie hard ore has been for years taken as the standard Bessemer ore of the old range mines.

A little over a year ago the Massachusetts Legislature granted a special charter to the Massachusetts Pipe Line Company to furnish fuel gas to Boston and other cities, and special privileges were accorded it, including the right to lay pipes on public streets and roads, and to condemn right of way, which aroused a good deal of opposition. This charter has now been transferred to a new organization known as the New England Gas and Coke Company, which has made arrangements to go to work at once. The company has secured land in Everett and Chelsea for the erection of works to supply the city of Boston. The first plant will consist of 300 by-product coke ovens, probably of the Otto-Hoffman type, and it is said that the company has made arrangements to market the coke largely with the railroads running out of Boston. Cape Breton coal will be used. The details of the plant have been worked out mainly from the experience gained in the small and partly experimental works which have been for some time in operation at Halifax, Nova Scotia.

This is a decided step in the campaign of gas against coal for use in cities. Boston is a favorable point, since the price of domestic fuel is higher there than in the cities near the anthracite coalfields. The new company does not intend to limit itself to the supply of domestic fuel, however, but expects also to furnish gas to factories and steam plants.

The increase in the demand for cadmium, which was mentioned in the last volume of The Mineral Industry, and the shortage in the supply still continue, notwithstanding a little more is being made in Upper Silesia (which is, indeed, practically the only district where cadmium is produced). The Upper Silesian production in the first quarter of the current year was 3,326 kilos. (valued at 11.844 marks per kilo.) against 3,256 kilos. (valued at 10.261 marks per kilo.) in the last quarter of 1896, and 2,436 kilos. (valued at 5.330 marks per kilo.) in the first quarter of 1896. At present it is said the metal is lacking entirely, and urgent demands for it cannot be satisfied. The cause for this peculiar situation is unknown. If the new demand proves to be permanent, however, there should be no difficulty in meeting it, since most of the Upper Silesian ore is cadmium-bearing, and the metal can be recovered without difficulty as a by-product at works where the distillation-muffles are equipped with the Dagner or Kleeman condensers, and provision is made to collect the escaping fume. With such an arrangement the cadmium fume is deposited especially in the first part of the common flue, furnishing a product which, if saved separately, is rich enough for treatment to recover the cadmium. At present this is done at only two or three works, and others probably will be slow to make the necessary arrangements until it has been demonstrated that the increased demand for cadmium is likely to be permanent, for after all the present business does not amount to much.

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It is an axiom in statistical work that figures which are arrived at by direct returns of the producers always understate the truth. This is because there is invariably a small part of the production, usually that of petty concerns, that escapes record. Especially is this true of gold, which can be disposed of so easily. Thus we know that there is a good deal of gold carried clandestinely from Siberia into China, and there is also gold produced by Chinese in California and elsewhere in the United States which is taken by them to China and does not appear in the statistics which are based on reports of deposits at the United States Mint and the production of American refiners. Some of this gold is reckoned subsequently as of Chinese production by taking the difference between the imports into China and the exports from that kingdom, but it is questionable if all of it is thus accounted for; probably it is not. Similarly there is undoubtedly some gold exported clandestinely from Mexico, the export tax which the Mexican government levies being an incentive to this. Probably a good deal of this gold appears subsequently in the American reports, but it is equally probable that the whole of it is not so included. Bearing upon this same point as to faithfully collected statistics is a statement in the last report of the Under Secretary of Mines of Queensland, where it appears that in 1896 the banks purchased 4,000

ounces of gold more than was returned officially to the Mines Department, even after making a liberal allowance for gold obtained by "fossickers" and various odd parcels. It is stated, moreover, that a similar excess usually occurs with respect to the Queensland statistics. There is, of course, a good deal of speculation as to where this gold comes from, but the government officials acknowledge their inability to give a satisfactory explanation.

The Aluminum Trade in Great Britain.

At an extraordinary general meeting of the British Aluminum Company, Limited, held recently in London, it was stated that action had been brought against all persons who had imported aluminum from America and Germany; injunctions had been granted, and all those who had disputed the monopoly had submitted except one or two who were about to submit. Under these arrangements none of the companies which manufacture aluminum in foreign countries will supply aluminum to Great Britain. The principal firm against which the company brought action was Sir W. G. Armstrong, Mitchell & Company, Limited, of Newcastle-on-Tyne, the great naval construction concern.

The grounds on which the British Aluminum Company has been able to establish this monopoly in Great Britain are not commonly understood, and the statement of the chairman of the company requires explanation. The suit against Armstrong, Mitchell & Company was defended by the Pittsburg Reduction Company, the naval construction company having used aluminum manufactured by the American producer and sold through its agent in Great Britain, the Aluminum Supply Company. This difference has been settled by a compromise, which gives the British Aluminum Company control of the manufacture and sale of aluminum in the United Kingdom.

The British Aluminum Company has now the right for a limited time to the use of Hall patents Nos. 5,669 and 5,670 for Great Britain, and has also an injunction granted on the Herault-Henderson patent. The Pittsburg Reduction Company's selling agent, the Aluminum Supply Company, Limited, has become the selling agent of the British Supply Company, that company having taken a half share in the Aluminum Supply Company, which had previously worked up a very good business as agent for the Pittsburg Reduction Company. The Pittsburg Reduction Company consequently will make no more sales of aluminum in Great Britain except through the British Aluminum Company, and the firms who have been importing German aluminum into Great Britain, having also submitted to the injunction, and agreed to a similar arrangement, it leaves the British Aluminum Company in possession of the field.

The Cost and Profits of Gold Mining in South Africa.

In some respects the most complete mining statistics that are published are those of the South African Republic, which are embodied in the reports of the State Mining Engineer. There are no others which enable so complete an analysis of the profits and losses of mining in an entire district to be made as do these, and since the district is the most productive of any now being exploited in the world the results are of great interest. The latest of these reports is that for the calendar year 1896.

During the year there were 185 gold mining companies in the South African Republic, representing a nominal capital of £55,225,225 (£41,172,950 in 1895) and a working capital (including cash paid to vendors) of £20,325,933. The dividends paid up to the end of 1896 amounted to £9,539,921, the distribution in 1896 having been £1,793,781, against £2,595,210 in 1895. The falling off is attributed to several of the mining companies having been operated previously on a rather speculative basis. Of the 185 mines in operation 79 were productive, the output amounting to £8,603,821, and 23 paid dividends.

The production of £8,603,821 (£8,569,555 in 1895) was derived, 68 per cent. from the stamp mills (plate amalgamation) and 32 per cent. by chemical treatment (chlorination and cyanide lixiviation), the proportion in 1895 having been 69 and 31 per cent. respectively. The average yield per ton of ore was about 40s., against 44s. in 1895. These figures, it should be remembered, include all the gold mines of the Republic, and not merely those of Johannesburg and vicinity, which are known as the Witwatersrand mines.

"It should not, however, be concluded from this falling off in grade," says Mr. G. Schmitz-Dumont, the State Mining Engineer, "that the ore at disposal has grown poorer. In comparing the figures for the tailings treated during 1895 and 1896 it will be seen that in the former year considerably larger quantities of old tailings were treated. Owing to these old tailings not having been kept distinct on the returns sent in by the mines, the amount of gold produced during 1895 was thus increased out of proportion with the number of tons of ore treated. It must moreover be observed that, as long as the mines do not introduce a proper system for weighing the ore, as well as the tailings, the weights given can only be approximately correct."

The ton of ore in the Witwatersrand statistics is supposed to be 2,000

pounds, but in practice it is probably not over 1,750. The sand is reckoned by measure, 24 to 30 cubic feet being calculated as a ton, according to tenor of water. The various technical conditions in the Witwatersrand were fully described by Mr. W. Y. Campbell in a series of articles recently published in the *Engineering and Mining Journal*, and it is unnecessary to refer to them again here.

The recovery of gold by amalgamation fell from 30·375 shillings (30·19) per ton in 1895 to 26·36 shillings (27·56) in 1896, the figures given first being for the Witwatersrand District and those in parenthesis for the entire Republic. This falling off indicates the increasing pyritic character of the ore, with the increasing supply that is drawn from the lower levels. As a corollary the tailings might be expected to be richer, which was the case. They averaged 20·41 shillings (20·54) per ton in 1895 and 20·73 (21·61) in 1896, but their yield was 14·14 (14·70) in 1896, against 13·25 (14·23) in 1895. This indicates an improvement in the metallurgical practice, the salvage being 68·21 (68·02) per cent. in 1896, against 64·92 (69·28) per cent. in 1895, assuming that ore weights were approximately correct. The Siemens & Halske process gave 13·17 shillings per ton out of an assay value of 19·74 shillings, or 66·70 per cent. In the treatment of concentrates, cyanide gave 112·29 shillings out of 130·22, about 86 per cent., while chlorination gave 372·89 out of 416·73, or 89·5 per cent. The ratio between concentrates and tailings was 1:75.

The total yield of gold in the South African Republic from 1884 to 1896, both years inclusive, has been £42,334,248. The comparatively small increase in the product of 1896 over that of 1895 is not attributed to the exploitation of the ore deposits at their maximum capacity, but to deficient supply of water and native labor, in which it is considered a limit has been reached, which can only be passed by slow steps. Nevertheless the production of the Witwatersrand in 1897 is showing another astonishing increase, as we have previously pointed out.

The total expenses in the South African gold mines and metallurgical works in 1896 were £9,740,921; in the Witwatersrand alone they were £8,474,957, divided as follows: 1a, food, £426,955; b, white labor, £2,607,304; c, native labor, £2,125,060; total on account of labor, £5,159,319; 2, forage, £43,449; 3, candles, £96,351; 4, paraffine, £13,893; 5, explosives, £808,567; 6, coal, £824,686; 7, cement, £43,736; 8, lubricants, £94,860; 9, paint, tar, etc., £8,025; 10, belts, hose, etc., £22,420; 11, mining timber, £127,137; 12, deals, etc., £216,868; 13, iron and steel, £178,745; 14, shoes and dies, £43,943; 15, cyanide of potassium, £166,900; 16, mercury, zinc, etc., £20,847; 17, other chemicals, £26,085; 18, sundries, £579,126. This was £2 2s. 5d. per ton of ore crushed (3,995,923 tons). The amount of tailings treated was 2,845,936 tons, and of concentrates 40,401 tons. The consumption of candles amounted to 148,357 cases; they cost an average of 12s. 11·9d. per case. The consumption of dynamite, blasting gelatine and other explosives was 33,858, 109,598 and 3,060 cases which cost respectively 91s. 10·2d., 107s. 4·6d. and 89s. 5·5d. per case. Of coal there was used 863,811 tons, which cost 19s. 1·1d. per ton.

The most important feature of this statement is the showing that against the £7,781,845 which the Witwatersrand produced in 1896 there was an expenditure of £8,474,957 (not including management and new construction), that is, a deficit of £693,112, but since, according to *The Mineral Industry*, £1,541,959 was paid out of the product by certain companies in dividends, other companies must have lost an equivalent amount. The statement for the year may be summarized as follows: Dividends, £1,541,959; losses, £2,235,071. The production, operating expenses, etc., for three years have been as follows:

Year.	Tons. a.	Yield. b.	Per ton. £ s. d.	Expenses. b. £ s. d.	Per ton. £ s. d.	Dividends. c. £ s. d.	Losses. d. £ s. d.
1894.....	2,871,395	£6,718,168	2 7 6	£5,232,043	1 16 5	£1,477,937	
1895.....	3,501,697	7,693,010	2 3 11	7,029,662	2 0 2	2,161,993	£1,468,645
1896.....	3,995,923	7,781,845	1 18 11	8,474,957	2 2 5	1,541,959	2,235,071

a, Cravings. b, From reports of State Mining Engineer. c, From *The Mineral Industry*. d, Profit.

In calculating the average expense per ton the ore crushed is, of course, charged with the expense of developing new mines, which have not yet become productive. This is proper in considering the district as a whole, since this dead work is necessary to maintain the production in subsequent years, and the dividend payers of to-day are in this happy position from the dead work of previous years.

We have referred frequently to the misleading representations of the profits in mining, which are based only upon the successful enterprises, while the losses in the unsuccessful are overlooked. To make the statement for the South African mines complete we ought to have a report of the annual losses from the beginning, but, unfortunately, these excellent statistics do not go so far back as that. We are consequently unable to compute the ultimate cost of producing gold there. The figures presented are very instructive, however, and it is to be borne in mind that they pertain to one of the great ore deposits of the world, one that is comparable in extent with the Comstock Lode; one that labors under certain unfavorable conditions of exploitation, it is true, such as insufficient supply of labor and water, high cost of materials and unfair governmental impositions, but on the other hand is favored by the geological conditions, having a series of lodes that partake more of the character of a regular marine deposit than of a more or

less irregular fissure mineralization, and a higher grade of ore than any large producing district of the day except Rockhampton (Mt. Morgan), in Queensland, and the Colar field of Mysore, in India.

NEW PUBLICATIONS.

A TEXT-BOOK ON ROOFS AND BRIDGES: PART II.; GRAPHIC STATICS. By Mansfield Merriman and Henry S. Jacoby. New York: John Wiley & Sons, and London, Chapman & Hall. Pages, 234; illustrated. Price \$2.50.

There is very little to be added to a former review of this book. The present is the third edition, containing some new matter, especially in the way of illustrations, and some improved methods of graphic analysis. The book has been in use long enough to be a standard authority on the subject.

THE RAILWAY BUILDER. By William Jasper Nichols. Philadelphia: The J. B. Lippincott Company. Pages, 288; illustrated. Price, \$2.

This is a handbook convenient for railroadmen and civil engineers, containing many facts convenient for reference, such as notes on cost of earthworks, masonry, bridge-work, etc.; notes on surveys, contracts and specifications, with many other similar matters. It is not intended to take the place of more complete works, but simply to serve as a reference book which can be readily carried in the field or elsewhere.

THE FLOODS OF THE MISSISSIPPI RIVER. By William Starling. New York: Engineering News Publishing Company. Pages, 58; illustrated. Price, 50 cents.

This is a reprint of a series of papers published in *Engineering News* on a topic always of much interest, but especially so since the great floods of 1897. Major Starling has for a number of years been employed in levee work along the lower Mississippi, and has a thorough knowledge of his subject. He has made an excellent monograph, which is not too technical for the general reader.

SLIDE VALVES: WITH AN EXPLANATION OF THE PRINCIPLES OF SHAFT GOVERNORS. By C. W. McCord, Jr. New York: John Wiley & Sons, and London: Chapman & Hall. Pages, 168; illustrated. Price, \$2.

Very few subjects connected with engine design and construction have been more written about than valves and valve gear, and it is rather a difficult matter now to write anything that is new. The present book is practical and has some excellent hints about setting valves, while the rules for proportioning and designing are generally those approved by experience. There is nothing especially new about them, however, and the diagrams are hardly as clear as those in Forney's *Catechism of the Locomotive*. The chapter on shaft governors is the best part of the book.

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.

American and other Machinery Abroad. By Fred. J. Miller. New York: published by the American Machinist, 1897. Pages, 90.

Tenth Annual Report of the Bureau of Industrial and Labor Statistics for the State of Maine. Samuel W. Matthews, Commissioner. Augusta, Maine: State Printers. Pages 242; illustrated.

Keister's Corporation Accounting and Auditing. By D. A. Keister. With an introduction by Hon. Henry C. White. Cleveland, O.: The Burrows Brothers Company, 1897. Pages, 525. Price, \$4.

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.

Electric Pumping and Ocean Power.

Sir: I have been bothered a good deal to find out whether: 1. Electric pumps have been successful in any mine; and 2. Whether the ocean has ever been utilized as a source of power. I shall be greatly obliged to you if you will answer these questions. SAMUEL A. THOMPSON.

BARIMA RIVER, British Guiana, S. A., Sept. 1, 1897. [Electric pumps are working in mines in Pennsylvania, Ohio, West Virginia, British Columbia and South Africa and elsewhere. These are, of course, power pumps driven by an electric motor. The Gould's Manufacturing Company, of Seneca Falls, N. Y., makes them in sizes to deliver from 500 to 15,000 gals. per hour, the regular type of pump manufactured by this company being designed to work against a pressure of about 130 lbs., though for the South African gold mines special pumps have been built for more severe duty.

The power of the ocean as rendered available by the rise and fall of the tide has been utilized in isolated cases. A very interesting description of one of these is contained in the *Technology Quarterly* of March, 1896, under the title of "Sea Mills of Cephalonia," by Prof. W. O. Crosby. The total amount of power utilized from the rise and fall of the tide at the present time, however, is insignificant.—EDITOR E. & M. J.]

Steel Production in Belgium.—The official returns which have just been issued show that there has been a fair increase in the production of steel billets, ingots, blooms, etc., in Belgium, the total output during the first half of the year having amounted to 304,744 tons as compared with only 279,841 in the first six months of last year.

THE RUSH TO THE KLONDIKE.

Written for the Engineering and Mining Journal by Ellis Morrison.

On July 17th, 1897, the steamship *Portland* landed at Seattle, bringing some 40 miners from the Klondike with wonderful tales of the rich finds of gold in Alaska and the Northwest Territory, and they substantiated their declarations by the display of over \$1,000,000 in golden nuggets and dust. While it is true that no one can correctly estimate the amount of gold which has been brought down from Alaska during the present year, for the reason that the 500 or more miners that have spent the winter and summer of 1896 and 1897 in that country and have returned home, will not make any definite statement as to their holdings, yet from information furnished by officers of the various vessels, in round numbers, \$9,000,000 has been brought already to the United States, as follows:

Steamship <i>Excelsior</i>	\$1,000,000	Steamship <i>Cleveland</i>	\$200,000
Steamship <i>Portland</i> , 1st trip....	1,000,000	Schooner <i>South Coast</i>	300,000
Schooner <i>Coleman</i>	100,000	Steamship <i>Excelsior</i> , 2d trip....	2,500,000
Schooner <i>Fred E. Sander</i>	500,000	Steamship <i>Portland</i> , last trip....	2,500,000
Steamship <i>Portland</i> , 2d trip....	200,000	From all other vessels.....	700,000

Since the news of the rich finds of gold on the Yukon and its tributaries was wired over the country over 5,000 people from the East have sailed from Seattle for Dyea, Skaguay, Wrangel and St. Michaels, all heading for Dawson City, about one-fifth going in by boat up the Yukon River from St. Michaels, while the remainder have taken the trails over the Chilcoot and White passes. At the present time Skaguay has a population of 5,000 impatient miners, but only the most energetic will succeed in getting over the passes to the lakes. The Skaguay trail is now in a horrible condition, and is almost impassable for either man or beast. This pass is crossed by so many deep gulches that one is constantly compelled to go down one side and struggle up the other, through mud, water and slush that reaches the knees, and often the waist. Those who went to Dyea have gone over the Chilcoot pass, which is dry, though much steeper, and all supplies have to be packed on the back of the owner, or by hired packers, who, by the way, charge the modest sum of 30 to 40c. per pound for packing a distance of 40 miles from Dyea to Lake Linderman. When once one has gotten over the Chilcoot pass, then it is a gradual slope to the lake. The Dalton trail and G. Bound's trail have been used by drovers, who have taken in beef cattle.

All trails will be passable in winter, and all the Seattle people who have claims near Dawson City and are wintering at home will return in March, that being considered by them as the best month to travel over the trails. Dawson City has now about 2,000 inhabitants, and over 4,000 men are working in the mines around the city. It is estimated that in the spring Dawson City will have a population of from 12,000 to 15,000.

The latest report from Dawson is that the stock of provisions is entirely inadequate to feed the people who are now there. However, nearly all miners going infrom Seattle have averaged over 1,000 lbs. of provisions to the man, and this will furnish subsistence not only for themselves, but for others. The first boats that start in the spring with supplies for Dawson City cannot reach there before July 1st, 1898.

Among the many plans for overcoming the difficulties of these trails is an overhead wire tram for Chilcoot pass, a railroad for Skaguay and a railroad at Wrangel, all to connect with the lakes, whence there is navigation by boat to Dawson City. This tram is now being constructed at Chilcoot pass, and work will be continued on both passes this winter so that by spring they can be used. By that time there will at least be a good wagon road from Skaguay, and with the wire tram at Chilcoot transportation will be an easy matter compared with what it is at present.

[We are disposed to think Mr. Morrison, who writes from Seattle, has largely over-estimated the amount of gold brought in from the Klondike so far.—EDITOR E. AND M. J.]

The Salts of Calcium, Strontium and Barium.—J. H. Kastle, in *American Chemical Journal* 19, 281-290, reports that he has examined the calcium, strontium and barium salts of 280 acids, and from his observations has come to the general conclusion that of the calcium, strontium and barium salts of any acid, all or two of the salts of these metals will be found to be analogous in composition.

Recovery of Copper from Lake Huron.—From time to time there has been talk of recovering the cargo of copper of the steamer *Pewabic*, which sunk off Alpena, Mich., in Lake Huron in 1865, and several attempts have been made. The latest of these has been partially successful, the wrecking steamer *H. A. Root* having secured a part of the copper, which is said to be unaffected by its long submersion. The *Root* arrived in Milwaukee September, 30th, having on board about 50 tons of ingot copper and several masses of native copper, running from 400 lbs. up. The largest of these masses weighs 11,600 lbs., and there is another weighing 5,800 lbs.

Estimation of Tin in Tin-Plate.—H. Mastbaum in *Zeits. f. angew. Chem.*, 1897, 329, recommends the following method: 25 grms. of the material are boiled for five minutes with 50 cu. cm. of 10% hydrochloric acid, and the liquid poured off into a 250 cu. cm. flask; the operation being repeated with fresh acid two to four times, until the iron is completely stripped. The solution does not need filtering, but is at once made up to the mark, and 50 c. c. treated with ammonia in a 100 c. c. flask till stannous hydrate begins to fall, when 10 c. c. of yellow ammonium sulphide are added, the whole shaken, filled up and filtered. Fifty cubic centimeters of the filtrate are diluted with water, all the tin sulphide thrown down by acetic acid, and, after standing over night, the precipitate is brought on to a filter by the aid of 10% ammonium acetate. As, owing to the certain absence of copper, ammonium instead of potassium sulphide is employed, the washing need only be very slight; in fact, 50 c. c. of the sulphide solution can be directly evaporated and ignited in a porcelain crucible, but the former method is preferable. The precipitate is finally heated with fragments of ammonium carbonate until the ash is white.

MINERAL PRODUCTION IN ALABAMA.

The following is the production of minerals as reported to Dr. Eugene A. Smith, State Geologist and Secretary Alabama Industrial and Scientific Society, by the producers for the month of August, 1897, and for the seven months ending August 31st:

	August.	Eight months.
Coal.....Tons	401,506	3,174,425
Coke....."	109,270	771,100
Iron ore....."	136,953	1,363,665
Pig iron....."	62,279	538,066
Limestone and dolomite for flux....."	21,774	171,168
Bauxite....."	808	4,040
Building stone.....cu. ft.	5,000	31,280

The total number of employees engaged in the mineral industries in August is reported at 12,960 in August, against 12,295 in July, 14,962 in June, 13,169 in May and 13,500 in April. The bauxite does not include that mined by the Southern Bauxite Company, which is shipped from Georgia. 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.

As compared with July there was a heavy decrease in coal and some falling off in iron ore. Coke made showed an increase, but the make of pig iron was smaller by 7,912 tons.

PROSPECTING WITH THE DIAMOND DRILL IN CALIFORNIA.

N. B. Knox describes in the *Mining and Scientific Press* the practice at the Wildman mine at Sutter Creek and at the Alma at Jackson. The machine used at the Wildman mine has a 7-in. cylinder and 5-in. stroke. It will drill a hole 600 ft. deep and take out a core $\frac{1}{8}$ in. in diameter. The drill, hoist and pump are worked by compressed air. The weight of the machine complete is 585 lbs. A man and a boy are required to operate it. A horizontal hole in quartz is drilled at an average of 30 ft. a day at the start, the speed decreasing to 20 ft. per day toward the finish. In a long run these figures are high and this speed will not be realized. One hole 600 ft. long averaged 16 ft. per day. The Mariposa slate drills easily, but it is often hard to keep the holes straight, as the drills tend to follow the cleavage planes of the slate.

The power required to run a drill of this size is 5 H. P., but this varies with the same factors that govern the speed. After every 40 ft. of quartz or 150 ft. of slate drilled the carbons must be reset. It takes an expert a day to set a bit with six stones. As soon as a stone wears loose it should be removed from the hole immediately. This is done by increasing the flow of water and washing it out, by using an old bit cut with an irregular groove which is filled with tallow, resin or beeswax, to which the lost diamond will adhere, or by driving a piece of soft pine in an old bit and jamming it against the diamond.

The most expensive items in drilling are the carbons and their settings. The carbons cost about \$15 a carat (206 gr.) and six stones of three carats are used to a bit. It costs \$10 to set a bit, making a total cost of \$280 per bit. The cost per foot of wear and tear on diamonds is 50c. in hard rock and 25 to 30c. in average rock. The cost per foot of the 2,000 to 3,000 ft. drilled last year at the Wildman, including everything except power, was 64c. The drill itself, including 600-ft. rods and two bits, costs \$2,000.

SEPARATION OF ARSENIC FROM ANTIMONY.*

By Oscar Piloty and Alfred Stock.

The quantitative separation of arsenic, antimony and tin is one of the most difficult problems of mineral analysis, if the separation of each element is required. We shall now describe a procedure which we have elaborated for the separation of arsenic from antimony and which seems to us calculated to solve this question with accuracy and expedition.

The observation upon which our method depends is the volatility of arsenic with hydrogen sulphide in a strongly hydrochloric acid solution. This fact may perhaps throw a light on the causes of some of the many discrepancies observed in the precipitation of arsenic as sulphide. If we heat arsenic tersulphide with very strong hydrochloric acid until there is a brisk discharge of hydrochloric acid, the chief part of the arsenic escapes with moderate ease and the yellow arsenic sulphide disappears almost entirely. Indeed, our experiments showed that from a solution of arsenic teroxide or pentoxide no sulphide is precipitated by sulphuretted hydrogen if it is heated to ebullition with a simultaneous introduction of gaseous hydrochloric acid. Under these conditions the arsenic distils away entirely in a short time from the solution, probably as trichloride.

From the foregoing it will be readily seen that the precipitations of arsenic can be accurate only if the solutions containing the metal are but slightly acid, or are not heated in presence of much hydrochloric acid.

We must emphasize this condition the more as we cannot find it mentioned either in journalistic literature or in standard works on chemical analysis. On the contrary, it has often been definitely shown that arsenic pentasulphide precipitates in heat from a hydrochloric solution, and contains tersulphide in abundance, in full contradiction with the statements of Bunsen concerning the precipitation of pentasulphide. Our observation seems to us fully to explain this contradiction.

The partial reduction of arsenic acid on heating in concentrated hydrochloric acid has been already noticed. Lately Neher has reported on this observation. He informs us that under certain circumstances, on precipitating such a boiling solution with hydrogen sulphide, there is formed above the liquid a cloud of arsenic trisulphide. But he also failed to notice the behavior of concentrated hydrochloric solution on the action of sulphuretted hydrogen, and the decomposability of the tersulphide already precipitated.

We should here remark that the precipitation of the arsenic in the slightly hot hydrochloric solution, as first used by Bunsen, always gives excellent results. The attributes of arsenic pentasulphide are so striking

that the weighing of arsenic in this form seems preferable to all other methods.

Since other metals on the permanent presence of an excess of hydrochloric acid are not affected by hydrogen sulphide, it was our task to apply the described behavior to arsenic for its quantitative separation from all other metals. We undertook, in the first place, its separation from antimony, and we obtained very accurate results.

Geological Survey of Wisconsin.—A geological survey of this State is now being made under the direction of Prof. E. A. Birge.

The Production of Soda in Germany.—*Handels-Museum* reports that the production of ammonia soda in Germany again increased in 1896. Two new factories were built. The total production of soda in the world is now estimated at 1,250,000 tons. Russia consumes about 2,000,000 pounds of calcined soda, of which the Russian factories furnish about 1,800,000 pounds, and about 200,000 pounds are imported.

The Separation of Silicic and Tungstic and Molybdic Acids.—James S. de Benneville in *Journal of the American Chemical Society*, 19, 377-379, points out that silica is not insoluble in ammonia and that the volatilization method, recommended by Arnold (*Steel Works Analysis*), is unquestionably preferable for the separation of these acids. E. D. Desi, *loc. cit.* pp. 213-241, states that molybdic acid can be separated from tungstic by treatment with sulphuric acid in which molybdic acid is soluble and tungstic is insoluble.

Margot's Alloy.—The alloy known by this name exhibits a curious modification of color; it is purple with ruby-red reflections. It is a compound of 22% of gold with 78% of aluminum. It is very beautiful, but it is deficient in malleability. Margot is of opinion that its color is due to microscopic crystals of alumina disseminated in the mass; but this is open to doubt. The yellow alloy of platinum and aluminum can, by a modification of the proportions, be rendered violet or greenish. A rose-colored alloy is obtained with 750 parts gold, 200 parts silver, and 50 parts of copper.

Ore Reserves of the Broken Hill Proprietary Company.—In June, 1896, the Broken Hill Proprietary Company issued a memorandum in which was stated the quantity of ore in sight in the company's area to a depth of 400 ft. from north boundary to the Jamieson shaft, and to a depth of 500 ft. from the Jamieson shaft to the southern boundary, respectively about three-fifths and two-fifths of the total length of property, was reckoned at 2,019,000 tons. This omitted what had not yet been fully proved by exploration galleries, but which it was considered may safely be counted on to yield 600,000 tons. In the report to the end of November, 1896, it was set out that in depth greater thickness of ore body existed than had been suspected, and that whereas above the No. 5 level the thickness had been 50 ft. to 60 ft., at No. 5 level the sulphide zones showed a thickness of 130 ft. to 140 ft. The same memorandum set out that the estimated unworked supplies of oxidized ore might be placed at 1,250,000 tons. In 1896 the company mined 426,000 tons of ore.

Cyanide Works at Mercur, Utah.—There are now six cyanide works in operation in the Mercur district, or about to be started, with a nominal capacity of 760 tons per diem. The new Northern Light mill is working on an ore that carries more silver than gold, and its successful treatment has yet to be demonstrated. La Cigale mill is nearly completed, but it is unlikely that any ore will be treated before November. Several interesting innovations have been introduced in this mill, the chief of which is the self-dumping rectangular tanks. The new Chloride Point mill is expected to be in operation in December, and that of the De La Mar Mercur mines, which is planned to treat 500 tons per diem at the outstart, is also expected to be ready before the end of the year. The capacity of the latter works is to be increased to 800 tons per diem before 1898. The Chloride Point and De La Mar mills are not included in the above statement of the present milling capacity of the district, 760 tons a day. The Sunshine mill is idle.

Shaft Sinking by the Poetsch Process in France.—Mr. Louis Gebhardt gives in the *London Mining Journal* the results of sinking a shaft by the Poetsch process at Ligny-lez-Aire, at the western end of the Pas-de-Calais coal-field. The thickness of permeable covering there is about 90 yards. The boring of the holes for the freezing pipes began at the end of April, 1895, and on October 12th holes were finished, and the freezing machinery was installed. It was set to work on December 19th when a cold of 23° Fahr. was produced, while the temperature of the ground was 54° Fahr. On January 1st, 1896, the cold was 5° Fahr. The freezing then proceeded with great regularity, and on February 19th sinking was begun at first by one set of men, but, later on, with three eight-hour shifts. On May 6th the end of the frozen ground, a depth of 300 ft., was reached. The sinking was continued for another 12 ft., and a wooden crib inserted with 2 ft. of walling upon which the cast-iron tubing was built. Each ring was 5 ft. high, and consisted of eight segments. On July 16th the lining of the shaft was complete. Thus it took only 15 months to sink a shaft 312 ft. deep. Other successful instances are recorded at Courrières, in the Pas-de-Calais coal-field, where the shaft was completed by the freezing process in 10 months, whereas previously fruitless efforts had been made for two years and a half to sink the shaft by another method, and also at Flines-lez-Raches, in the same coal-field, where a shaft 280 ft. in depth was completed in 14 months. The last case is especially interesting, having been accomplished in conditions of greater difficulty than any of its predecessors. The thickness of permeable strata to be traversed was 230 ft., and at the junction of the Tertiary rocks and the chalk a spring was encountered which had also to be frozen.

* *Berichte*, No. 12, p. 164, and *Chemical News* September 17th, 1897.

PLACER MINING IN THE KLONDIKE COUNTRY.

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

Special conditions call for special methods to meet them, and this is certainly true of placer mining in the Yukon gold belt and more especially so in the Klondike district. With the exception of some placers in Siberia, nowhere else have men undertaken to seek for gold above the line of constantly frozen ground. The work is too arduous and forbidding, except for the short summer months when the heat is almost unbearable and the mosquitoes worse. The ground below is frozen solid down to bedrock, almost as hard and even more difficult to excavate. The frozen earth and gravel can be blasted only with great difficulty, and the only method available has been to thaw the ground by fire, as is done in the Siberian mines.

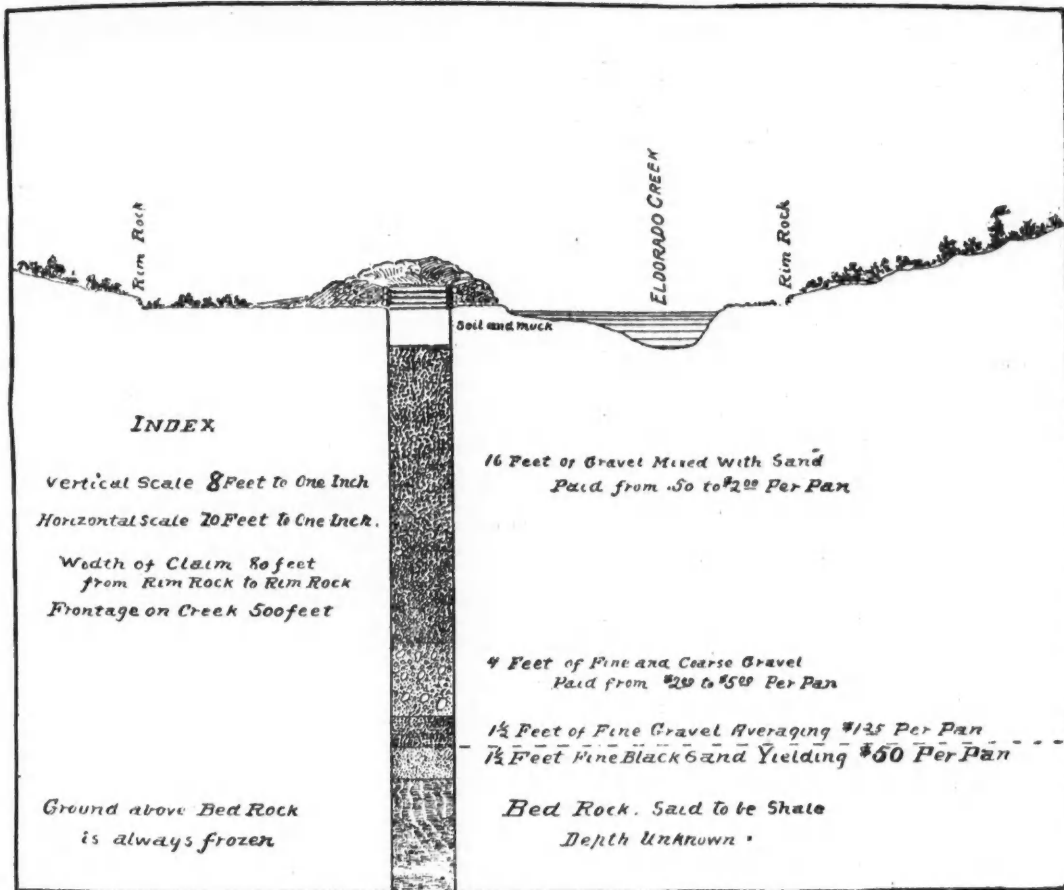
On El Dorado Creek, which is the richest and best known of the tributaries of Bonanza Creek, the branch of the Klondike on which the first strike was made, the bedrock on which the rich pay-streak lies is found at a depth varying from 9 ft. at the mouth to 20 ft. and even 28 or 30 ft. higher up. The top layer, from 1 to 5 ft. thick, is of muck composed of decaying vegetable matter and soil which in places is covered by

utilizing the supply of water which is to come when the snow on the hills thaws out in the spring.

The work is then carried on down to bedrock, next above which, with a depth of about 18 in., lies the rich pay-streak. From this and the cracks and rifts in the shale rock underneath it come most of the nuggets. This stuff is laid by itself on the dump and given special care in washing, as it abounds in dust and flaxseed gold as well as nuggets. Many men have been satisfied with one season's work on this rich deposit.

On all the deeper claims after reaching bedrock only the pay-streak and the two strata above it are followed by drifting. The method is the same as in the vertical shaft, wood being piled at the end of the drift and burned to thaw out the ground. While more men can find room to work the progress made is comparatively slow, as for lack of draft the fire burns slowly and the smoke takes a longer time to clear out of the way, so as to allow the men to get at the work of digging and hoisting out. In thus going down to bedrock and then drifting on only the richest strata, the readiest and largest returns are secured for the time and labor expended.

This was the first object with the poorer Klondikers, to take the richest, make their pile and get out of the country, leaving the other stuff to be worked by those who came after them, as it all will be when improved



SECTION ACROSS GULCH, ELDERADO CREEK, KLONDIKE DISTRICT.

long and thickly matted moss. The summer heat melts the surface where exposed to a depth of a few inches, making a very disagreeable footing. Under the muck come the several strata of gravel and sand shown in the illustration which is a typical section across the creek. The uppermost stratum of gravel varies in thickness in places, but is quite uniform as to the amount of gold carried to the cubic foot; while those below are quite uniform on all the claims along the creek in thickness as well as in amount of gold. Under different conditions or in any other diggings but the Yukon the upper layer of gravel would be carefully worked and most likely will be in the future even there; but so far the Klondikers have wasted but little time on it, only taking out so much as was necessary to reach the richer strata below and in most cases not even washing out the gold from what they did handle.

In sinking the shafts all the loose top stuff that can be cut and scraped away is first removed and then a good pile of wood cut from the adjoining hills is made and set on fire. By the time this has burnt out the ground below it is thawed to a depth of several inches. Pick and shovel are then used to remove this over a space of from 8 to 12 ft. square, and the shaft may be said to have been started. Alternate firing and digging in time carry it down through the muck and the thick upper layer of gravel to within some 7 or 8 ft. of the bedrock.

When the shaft becomes too deep to toss the dirt out with a shovel a windlass is rigged, and it is hoisted out by a rope and bucket, the latter generally made of a half barrel, with a rope handle passing through three holes near the top. When the poorer upper gravel has been passed the material, as far as loosened by the fire, is taken from the sides as well as at the bottom of the shaft, and the dump for sluicing is begun. This is made with an eye to the most convenient and economical way of

conditions as to labor, supplies and proper machinery exist. So far it has not been found necessary to leave pillars or put in supports for the roof of the drift. So firmly is the material frozen that it is as hard and strong as the bedrock below.

From rim-rock to rim-rock the El Dorado Creek bottom varies from 80 to 500 ft. in width, and, as far as ascertained, the deposits are quite uniform over the whole with a length of about eight miles. The amount of gold yet to be handled on this creek alone must be very large.

A large number of the nuggets taken out of this creek have had quartz imbedded in the metal, showing their original home to be not far distant, but as yet no definite location has been made of any quartz ledges. As a matter of fact, few have turned their attention in that direction; the heavy covering of thick, matted moss that lies on the hills hides the rocks from sight, and makes prospecting extremely difficult. The more certain returns from the creek bottoms have so far been the more attractive to the miners.

Although much has been written in regard to the erosion of these valleys and the deposit of the gold by the action of glaciers, an inspection of a large quantity of nuggets from the several branches of the Klondike seem to show that they have never been subjected to the squeezing and grinding forces in evidence on the terminal moraines to be found along any glaciers. They rather show proof of gradual and gentle loosening from the original rock and of the after action of water, and that only to a limited degree.

Yukon Gold.—According to the officers of the Selby Smelting Company gold nuggets from the Yukon are worth from \$17 to \$18 per oz. and gold dust from \$16 to \$17 per oz. The Yukon gold contains a large proportion of silver and some iron, the latter giving it a fine rich color.

*See Engineering and Mining Journal for June 12th, 1897, page 599.

NOTE ON THE ACTION OF POTASSIUM ZINC CYANIDE SOLUTIONS ON GOLD.

Written for the Engineering and Mining Journal by W. J. Sharwood.

(Continued from page 396.)

Most of the writers quoted have assumed either that caustic potash does not act at all on the double zinc cyanide, or that it reacts with it completely, forming potassium zincate and simple potassium cyanide, as indicated in equation I.; probably the correct view is that taken by Goyder (*Chemical News*, 72, 81), that the reaction does take place, but is incomplete; so that, when equilibrium is attained, there will be four substances in solution, KOH, K_2ZnCy_4 , KCy and K_2ZnO_2 , the proportion of KCy to K_2ZnCy_4 increasing with the amount of KOH added.

If it could be shown that additions of caustic potash increased the solvent power for gold of potassium zinc cyanide solutions with each addition of potash, this would go far to prove that such a partial decomposition takes place.

The experiments quoted by Wells gave the following average results, the pieces of gold used being of equal area:

Exp. Nos.	Nature of solvent.	Mgms. gold dissolved.	Hours.
17-18	30 cc. $\frac{1}{2}\%$ KCyAq, in test tube.....	3.55	24
14-16	30 cc. $\frac{1}{2}\%$ KCyAq + KOH, in test tube.....	3.36	24
7-10	30 cc. $\frac{1}{2}\%$ KCyAq saturated with $ZnCy_2$ in test tube.....	2.45	24
11-13	30 cc. Same + KOH, in test tube.....	2.6	24
5-6	250 cc. $\frac{1}{2}\%$ KCyAq saturated with $ZnCy_2$, in flask.....	7.35	24
1-4	30 cc. Same in test tube.....	3.8 to 6.0	72

Nos. 7 to 13 indicate that the amounts dissolved by K_2ZnCy_4 + KOH are very slightly in excess of those dissolved by K_2ZnCy_4 alone under similar conditions, so slightly that the experimenter concluded that these experiments go to prove that the double salt is not decomposed by the alkali. The proportion of alkali added is not stated. It was suggested by E. B. Wells that the solvent used in these experiments (1-11) might contain free KCy, but this is most improbable. Still it seemed possible that some impurity might be present in a solvent so prepared. The so-called 98 or 99 per cent. potassium cyanide often carries several per cent. of carbonate, part of the potassium being replaced by sodium; and precipitated zinc cyanide is almost always basic, containing both carbonate and hydroxide of zinc, the former resulting from impurities in the alkaline cyanide used to precipitate it, the amount of hydroxide increasing with the dilution of the solutions used in preparing it (see Gmelin's *Handbook*, VII.).

PREPARATION OF SOLUTIONS.

I therefore prepared potassium zinc cyanide solution in three ways:

1. By treating a decinormal solution of the best commercial (98%) potassium cyanide with an excess of precipitated (basic) zinc cyanide.
2. Similarly, but with the purest materials obtainable, which were proved to contain only traces of impurity.
3. By thrice recrystallizing rapidly from hot solution the product obtained from a strong solution made by method 1, I obtained crystals which analysis showed to contain over 99.5% of K_2ZnCy_4 , with 0.2% of water, and traces of sodium and of sulphates. A solution of 1.25 g. of this salt in 100 cc. water gives a solution of similar strength to (1) and (2), and certainly free from simple KCy, unless water dissociates the double cyanide.

Analysis showed the following composition per 100 c.c.:

	1.		2.		3.	
	Materials not pure.		Pure materials.		From crystals.	
	Gms. (mgm-atoms.)		Gms. (mgm-atoms.)		Gms. (mgm-atoms.)	
K.....	.42	10.77	.39	10*	.3937	10.1
Zn.....	.352	5.38	.366	5.6	.329	5.0
Cy.....	.51	19.6	.549	21.2	.523	20.0

In No 1 sodium replaced about one-third of the potassium, but it was reckoned, atom for atom, as potassium; some carbonate was also present; 2 and 3 were practically free from sodium. In 1 and 2, and in five or six other solutions prepared by the same method, more cyanogen was found, and still more zinc, in the resulting liquid, than would be the case if two molecules of alkaline cyanide dissolved exactly one molecule of $ZnCy_2$. In 1 this is partly due to the action of K_2CO_3 on $ZnCy_2$, and perhaps to the formation of $NaZnCy_3$, but this does not account for it in other places; possibly another double zinc cyanide exists with a higher proportion of zinc and cyanogen (Bettel has suggested $17KCy \cdot 10ZnCy_2$).

The three solutions described were found to be almost identical in efficiency as solvents for gold and silver. Each dissolved gold leaf in a few hours,* more rapidly in proportion to the accessibility to air or oxygen. A white precipitate of some zinc compound separated out in some cases, but not in others when gold went into solution; this precipitate was less frequently observed with the solvent prepared from the crystallized double cyanide. Thus small quantities (15 to 50 mgm.) of gold leaf were found to dissolve in less than 12 hours in 50 cc. of solvent 3 without any precipitation taking place; with larger quantities of gold a very slight precipitate of some zinc compound was observed; with the solvent prepared by method 2 a considerable precipitate was obtained, and still more with that made by method 1.

Attempts were made, using known quantities of gold and of solvent, to obtain enough of this precipitate for accurate analysis, and to ascertain its composition and the proportion it bore to the gold dissolved, as well as the composition of the resulting solution. Several difficulties were

* It was also found that solutions, not only of potassium cyanide, but of caustic potash, potassium carbonate and bicarbonate, the corresponding sodium and ammonium compounds, disodic phosphate, lime, barium hydrate, and several salts of alkaline reaction, when digested with zinc cyanide in any proportion, yielded liquids which had the power to dissolve gold leaf in a few hours, most of them retaining zinc in solution. A decinormal solution of caustic potash, warmed with a large excess of zinc cyanide, gives a solution almost identical in composition and properties with No. 1 above described. On the other hand, sal ammoniac dissolves zinc cyanide to a clear liquid, which does not affect gold leaf after a week's contact.

met in attempting to make all these determinations from one experiment; it was not easy to wash the precipitate without loss, and washing may alter its composition (as stated by Gmelin). To dissolve any considerable amount of gold requires a large excess of solvent, otherwise the rate of solution falls off; on the other hand, taking too large a proportion of solvent makes it difficult to determine the exact amount of cyanogen withdrawn from the solution. A further uncertainty lies in the fact that zinc cyanide, and the oxide to a less extent, is somewhat soluble in solutions of many salts; and again, even if the cyanide of zinc were normally precipitated (as by reaction V. or VI.) it would very possibly be hydrolyzed and appear as a basic cyanide.

The following results were obtained in three typical experiments: Sixty milligrams of gold-leaf were treated with 25 cu. cm. of liquid 1, this being about half the strength of Wells' solvent; most of the gold dissolved in 12 hours, but after this solution went on slowly and a trace of gold was undissolved after 10 days. A small amount of precipitate separated as a white powder, and colorless crystals slowly formed on the lower half of the flask used, sticking firmly to the glass; after 12 days the liquid was poured off, and the precipitate washed and dissolved with the aid of ammonia. Gold, zinc and cyanogen were determined in precipitate and solution.

In another case a piece of gold foil was left 48 hours in 10 cu. cm. of liquid 3, a current of air (washed free from CO_2) being passed through it continuously. Solution went on rapidly at first, but after 24 to 30 hours a film of white precipitate formed on the surface of the gold and retarded solution. In this case the precipitate increased considerably after the gold was removed, 67 mgms. having dissolved. After standing a week protected from air, zinc and cyanogen were estimated as before.

	Found by analysis in		Originally taken.
	Precipitate.	Solution.	
(1) Gold mgms.....	Unweighable trace	*6595 to *060	*060
Zinc mgms.....	*0195	*065	*088
Cyanogen mgms.....	*0088	*066	*127
(2) Gold mgms.....	trace not	estimated	*067
Zinc mgms.....	*030	*004	*033
Cyanogen.....	*018	*011	*025

* Any cyanogen in potassium gold cyanides escaped estimation, but even allowing for this there is a loss of cyanogen which may be due to decomposition. As aliquot parts of a somewhat small original amount had to be taken for analysis, the errors in estimating zinc and cyanogen in the final products may reach 4 or 5% in the gold to 1%.

In a third experiment I treated 82.7 mgms. of gold leaf with 100 cc. of solvent 3, the liquid being in a stoppered flask with 10 cc. of air space above it. After 12 hours about half the gold had dissolved, but action then abruptly stopped; on introducing pure oxygen into the air-space, shaking, and again filling with oxygen, the remainder dissolved in less than an hour. No precipitate was then visible, but a very slight one formed after an hour; by comparison of capacity with precipitates of zinc hydroxide and zinc cyanide precipitated from dilute standard solutions in similar volumes of liquid, the precipitate was estimated to contain less than 2 mgms of zinc. After three days the precipitate had increased very slightly and separated sufficiently to allow of filtration; it was washed, ignited, and weighed; and zinc was afterwards estimated in it volumetrically as 6 mgms. The solution was found to contain 0.4955 mgms. cyanogen, against 0.523 originally.

To make these results comparable, they were reduced to atomic or molecular ratios, as shown in the following table, calculated on a basis of two atoms of gold dissolved. For two atoms of gold dissolved:

In exp.	The solvent contained.		Precipitate contained.		There was withdrawn from solution Equiv's Cy.
	Mol. K_2ZnCy_4 .	Mol. K_2ZnO_2 .	Atoms Zn.	Equiv's Cy.	
1.....	8.0	0.8	2.0	2.22	*13
2.....	2.95	0*	2.7	4.0	8
3.....	22.2	0*	0.4	?	4.66

* The cyanogen withdrawn from solvent includes that in double gold cyanide, that precipitated, and that lost by decomposition due to other causes.

A number of other determinations of zinc and cyanogen were made in similar experiments, but with equally variable results; whether made immediately after the gold had dissolved, or after some days' standing. In no case did the results agree, within the limits of errors in analysis, with those corresponding to either of the equations quoted at the beginning of this paper, but the results of 1 and 2 approach more closely to equation V., as stated by Wells and Anderson, than to either of the others. The precipitates were in all cases found to be mixtures of zinc cyanide and oxide, cyanide generally predominating.

The necessity for the presence of oxygen was fully confirmed in experiment 2 and in other ways; the influence of oxygen and of alkalis was further studied by observing the rate of solution of gold in varying mixtures of KOH and K_2ZnCy_4 , varying the access of air.

(To be concluded.)

Phosphorescence of Strontium Sulphide. — J.R. Mourello, in *Comptes Rendus*, 124 (22), 1,237-1,238, states that pure strontium sulphide, obtained by reducing the sulphate with carbon, by treating the carbonate at a red heat with hydrogen sulphide or by heating the carbonate with sulphur, is not phosphorescent. If any one of these sulphides, however, be heated for some time in an oxidizing flame, so as to form a small amount of sulphate, it becomes phosphorescent. After prolonged heating in an oxidizing atmosphere, so as to convert the greater part of the sulphide into sulphate, the phosphorescence is lost, but is recovered again on reduction by charcoal, even if that reduction has left even as much as 0.042% of sulphate. Strontium sulphide prepared by M. Mourello's method, when it is obtained as a hard, granular, semi-polished substance, not at all easily changed in moist air, but still containing a trace of sulphate, exhibits very strong phosphorescence. See also *Engineering and Mining Journal* for September 11th, 1897, page 804.

THE MINERAL PRODUCTION OF GREAT BRITAIN.

The annual Parliamentary *Blue Book* giving the statistics of mineral production of the United Kingdom for the year 1896 has been issued, and gives the following summary statement of quantities and values of the various kinds of minerals obtained during the year as compared with 1895, the values being those at the mine or quarry:

MINERAL PRODUCE OF THE UNITED KINGDOM.

Description of Mineral.	1895.		1896.	
	Quantity.	Value.	Quantity.	Value.
Alum clay (bauxite) tons.	10,408	£ 2,506	7,429	£ 1,918
Alum shale.....	2,463	253	.....	.....
Arsenic.....	4,798	52,198	3,616	45,483
Arsenical pyrites.....	2,951	2,785	8,908	8,007
Barites.....	21,170	23,059	23,737	25,590
Bog ore.....	5,652	1,413	6,632	1,863
Chalk.....	2,924,235	153,864	3,559,229	157,170
Chert and flint.....	91,787	16,661	107,967	17,030
Clays.....	9,796,086	1,839,607	11,341,782	1,442,069
Coal.....	189,661,362	57,231,213	195,361,260	57,190,147
Copper ore.....	7,531	21,912	8,970	21,586
Copper precipitate.....	280	2,855	198	2,124
Fluor spar.....	36	54	394	478
Gold ore.....	13,266	16,584	2,765	4,257
Granite.....	1,667,766	547,999	1,756,816	498,074
Gravel and sand.....	1,014,477	81,107	1,268,310	90,020
Gypsum.....	177,892	71,835	193,311	74,538
Iron ore.....	12,615,414	2,865,709	13,700,764	3,150,424
Iron pyrites.....	9,043	4,114	10,017	4,603
Jet..... lbs.	168	16	294	10
Lead ore..... tons.	38,412	273,392	41,069	303,398
Limestone (other than chalk).....	9,525,039	1,205,261	11,011,350	1,215,604
Manganese ore.....	1,773	681	1,680	613
Ochre, amber, etc.....	7,625	16,989	9,891	21,688
Oil shale.....	2,246,865	561,710	2,419,525	604,881
Petroleum.....	15	28	12	29
Phosphate of lime.....	500	875	3,000	5,250
Plumbago.....	40	100	Nil.	Nil.
Quartz.....	724	550	519	389
Salt.....	2,173,253	709,751	2,022,357	666,613
Sandstone.....	5,230,526	1,366,596	4,507,745	1,417,985
Slag.....	134,882	5,888	562,293	15,358
Slate and slabs.....	581,760	1,274,146	586,933	1,338,256
Soapstone.....	Nil.	.....	18,042	5,188
Strontium sulphate.....	12,273	3,529	7,663	259,918
Tin ore.....	10,612	370,530	35	1,500
Uranium ore.....	40	2,071	2,286,999	425,587
Whinstone, basalt, etc.....	1,728,350	352,382	43	1,355
Zinc ore.....	17,478	49,430	19,319	66,553
Total values.....	.....	£39,159,664	.....	£69,088,366

The average price of coal has shown a steady fall for several years, though it is still considerably above that at the mines in the United States. The average value reported in 1896 was \$1.40 per ton for England, \$1.62 for Wales, and \$1.22 for Scotland.

The following table shows the quantities of metals obtained by smelting from ores mined in the United Kingdom; the values here given are based on the average market price:

METALS SMELTED FROM BRITISH ORE.

Metal.	1895.		1896.	
	Quantity.	Value.	Quantity.	Value.
Copper, tons.....	579	£27,263	556	£28,180
Gold, ozs.....	6,600	18,520	1,352	5,035
Iron, tons.....	4,394,967	10,534,325	4,759,446	14,375,474
Lead, tons.....	29,000	308,734	30,818	350,940
Silver, ozs.....	280,434	34,908	283,816	36,365
Tin, tons.....	6,434	446,780	4,837	307,678
Zinc, tons.....	6,654	101,695	7,110	123,250
Total values.....	.....	£11,472,225	.....	£12,226,912

The output of pig iron in this table is very much below the total made by the blast furnaces. The actual production of pig iron in 1896 was the largest ever recorded, reaching 8,659,681 tons, the highest total previously having been 8,586,680 tons, in 1892. The total quantity of ore used amounted to 21,204,284 tons, of which 13,700,764 tons were British and 5,880,999 tons were imported. The quantity of coal consumed in the smelting of iron ore was 17,114,374 tons. The imported ore was apparently of higher tenor than the British. The consumption of native iron ore was 2.88 tons to the ton of pig iron made, but only 1.55 tons of foreign ore were required.

Russian Mining Schools.—New schools have been established by the Imperial Government at Tiflis and at Tomsk.

Price of Explosives.—Bradstreet's states that a reduction of 6% has just been made in export prices of smokeless powder by leading American manufacturers of this article. The change is made by varying the discounts, the previous list prices remaining unchanged. The present discounts are, on export orders, 25, 20 and 10%, with an additional 2% for cash in 10 days, against previous discounts of 23, 20 and 2%. The list prices are as follows: For canister, \$1; quarter kegs, \$5.75; half kegs, \$11.25; kegs, \$22; drums, equal to two kegs, \$43.50.

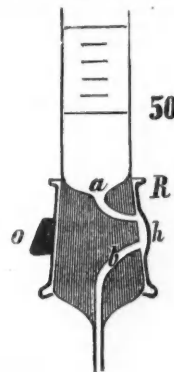
The Algerian Phosphate Deposits.—M. Chateau publishes in the *Memoirs of the French Society of Civil Engineers* for August, 1897, an important monograph on the phosphate deposits of Constantine and Algeria. The paper covers 118 pages, and contains a historical account of the discovery of sedimentary phosphates on the high tableland of Algeria, with a description of the geological structure, the nature of the phosphates, and the theory of their formation. The various deposits are described in detail, and particulars are given of the cost of production, the exports, the future of the industry, and the legislative enactments relating to it.

PLUMBING A SHAFT FOR SURVEY.

P. Ulrich in *Jahrbuch für das Berg- und Hüttenwesen im Königreiche Sachsen*, 1896, p. 112, gives the results of a mathematical study of the various methods of plumbing a vertical shaft. He concludes that the best results are obtained by the method of swinging plumb lines, proposed by Professor Schmidt in 1884. In the David Shaft at Freiberg, with water falling in large quantities, and with plumb lines 1,650 ft. in length, he made a series of observations lasting for six hours. Notwithstanding the irregular swinging of the plumb lines, and the fact that 25 determinations were required in order to arrive at the position of rest, the results differed from one another by, at most, 0.1 mm. The results of his theoretical investigations are that the measurements of length should be limited as far as possible, and that the accuracy of the measurements of the angles should be increased. He has, therefore, modified the construction of the theodolite stand in such a way that the plumb wire may be suspended from the center of the instrument at the surface, whilst underground the theodolite is set up at the two points representing the positions of rest of the swinging plumb lines. With this arrangement very satisfactory results have been obtained in practice.

A NEW FORM OF BURETTE.

A form of burette which can be used in titrating with liquids which cannot be brought into contact with indiarubber, is described by Carl Sander in the *Chemiker Zeitung*. For many purposes it is much more convenient than the ordinary glass stop-cock burette. As the illustration shows, the lower part of the burette is conical in form, having two small passages, *a* and *b*, passing through it. The ring *R* is slipped over this conical portion, and has in it a small chamber



h, so placed that it can be brought over the openings of *a* and *b*. When the ring is in this position the passages are connected and burette will be emptied; by a little manipulation the liquid contained can be drawn out either in a stream or drop by drop. The form of the ring tends to keep it always tight, and it can readily be moved as required by the projection *o*, a small lug made on the ring.

The Ellis-May Steel Casting Process.—In this process the castings are made in an air-tight chamber, from which the air has been completely exhausted. The theory is that in this way the air and gases which may be contained in the molten metal will naturally be drawn out and diffuse themselves in the vacuum, while the casting will be free from blow-holes and flaws.

Use of Slag as Road Metal in Chicago.—An experiment with slag paving in lieu of macadam is being made on Pine street, from Michigan to Illinois, in Chicago. The slag, which contains some iron, is porous and rolls easily, and traffic upon it does not create a dust, according to *Municipal Engineering*. It is smooth, easily repaired and pleasant to the eye, and the cost of laying is practically the same as macadamizing.

Accidents to Winding Ropes.—Some interesting statistics have been issued by the Dortmund Mining Bureau regarding the accidents with winding ropes that occurred at the collieries of the district last year, says the *London Mining Journal*. Out of 270 ropes discarded, five, or 1.85%, broke suddenly while in use. Out of the 5,405 ropes laid on one side during a period of 25 years, from 1872 to 1896, 254, or 4.70%, broke suddenly while in use. Of the above, breakages occurred in the case of 43 out of 736 flat cast-steel wire ropes, 19 out of 147 flat iron wire ropes, 7 out of 97 flat manilla fiber ropes, 80 out of 3,536 round cast-steel wire ropes, and 105 out of 881 round iron wire ropes, while not one of the eight hemp ropes gave way. In 1872 the percentage of wire ropes breaking was 19.30, while in 1896 it was reduced to 1.85.

Notes on the Geology of Chile.—In a paper read before the Berlin Academy of Sciences, abstracted by the *London Mining Journal*, Dr. Moericke states that in the Chilean Andes diabases were erupted from the end of the Triassic to the middle of the Cretaceous epochs. The erupted material then became more acid in composition (quartz-augite-diorite, quartz diorite, hornblende-porphyrates, granites, and quartz-porphyrates), and this continued until the beginning of the Tertiary period. The latter is characterized by basic plagioclase-augite, whilst the end of the Tertiary is characterized by acid eruptive rocks (hornblende-biotite-andesite and quartz-trachyte). This alteration in the basic and acid magma took place in Chile exactly as in the Sierra Nevada, North America, and in Transylvania. In Chile the rich silver veins and the argentiferous copper ores are associated chiefly with the diabases, whilst the gold and the auriferous copper ores are associated with the quartz-diorites, hornblende-porphyrates and quartz-porphyrates.

THE INTERNATIONAL GEOLOGICAL CONGRESS AT ST. PETERSBURG.—III.

Specially Reported for the Engineering and Mining Journal.

In the *Engineering and Mining Journal* for September 18th we gave a brief summary of the official report of the sessions of the International Congress in St. Petersburg. This summary we now supplement by the more detailed account furnished by one of our representatives present at the meeting.

The Seventh International Geological Congress met in St. Petersburg from August 29th to September 5th, and was notable not only for the large number of geologists present and the high scientific reputation of many of them, but also for the value of the communications offered and read and for the toleration displayed in the discussion. About 1,000 names of persons, representing 24 countries and colonies, were on the list of members, of whom a large proportion were present in St. Petersburg during the meeting. The largest representation, naturally, was from Russia, 270 persons; next to this came Germany with 188; then the United States with 113, France with 99, Great Britain with 72, Austria-Hungary with 53, and Italy with 51.

The congress was formally opened with much ceremony by the Grand Duke Constantine, president of the Imperial Academy of Sciences, and honorary president of the congress. In his graceful opening speech he took pains to refer to the fact that the idea of having international geological congresses originated in Philadelphia 21 years ago. This address was followed by one by the Princess of Oldenburg, welcoming the geologists in the name of the Imperial Mineralogical Society, of which she is the president. The Minister of Agriculture took occasion in his address to outline the steps by which the knowledge of the geology of Russia has reached its present stage. Desultory studies were begun in the last century by Pallas and other eminent men, and impetus was given to the work in the early part of the present century by the formation of scientific societies in the capitals and many subordinate cities, and the creation of chairs of mineralogy, geology and mining in the universities. The general, systematic study of the geology of the vast empire was not undertaken by the general government, however, until 1882, when the present Geological Survey was established. In the last few years the knowledge of Russian geology has rapidly extended owing to the exploration of the sources of the principal rivers, the study of the irrigation problem and the work on the route of the Siberian Railroad. This year a detailed study of the auriferous areas of Siberia has been begun, and the government has found it necessary to triple the personnel of the Geological Survey corps, and to augment considerably the funds at its disposal. Furthermore, preparation for this congress has kept the committee at a fever heat of work for a long time.

On behalf of the congress, reply to these addresses of welcome was made by Prof. G. Capellini, of Bologna, the senior past president of the congress present, and then Prof. E. Renevier, of Lausanne, president of the last congress (held in Zürich in 1894), announced the recommendations of the council regarding the organization of the present congress, which were promptly adopted by the members. Prof. James Hall, of Albany, who was present in spite of his 86 years, was made honorary past president out of special compliment. The president of the present congress was A. P. Karpinsky, director of the geological survey of Russia. Forty men were named as vice-presidents to represent on the council the 22 countries whose delegates were present. Four were allotted to the United States—Professors Marsh, Emerson, Frazer and Dr. Emmons.

In the course of this address of acceptance Dr. Karpinsky gave the necrology of eminent geologists for the time since the last meeting of the congress, the list including such names as Huxley and Prestwich of England, Beyrich of Berlin, James D. Dana of America, Daubrèe of Paris, Swendstrup of Denmark, Posepny of Austria, de Saporta, Bornemann, del Castillo of Mexico, and Cope of Philadelphia. He furthermore stated the object of existence of the congress, to secure a more nearly uniform nomenclature for the science throughout the world. This broad question is separated into three grand subdivisions, general geology, petrography, and stratigraphy, and four sessions were assigned by the council to the discussion of questions relating to these subjects. In closing his address Dr. Karpinsky dwelt upon the pleasure felt by all Russian geologists in welcoming in their capital their fellow-geologists from all over the world, upon the enlarged breadth of view accruing to themselves and upon the fact that more accurate knowledge about Russia and her people would be spread abroad among all nations.

Dr. Th. Tschernyschew, general secretary of the committee of organization and of the congress, then gave a brief summary of the history of the present meeting, and especially of the preparations for it. In a country like Russia, in which the distances to be traversed are great, the means of transportation not always good, and in which good hotel accommodations are lacking outside of a few large cities, the arrangement of the desired excursions before and after the sessions of the congress at St. Petersburg was a difficult task. Furthermore, a new geological map of European Russia had to be compiled and a complete guide book of all the excursions prepared. The arrangement of the excursions was rendered possible by the active co-operation of the Czar, the Minister of Agriculture and Public Domains, and various mine owners, cities and transportation companies. The preparation of the geological guide book (containing more than 600 pages) and the map was facilitated by the contributions of many geologists.

The first general session of the congress was devoted to the discussion of the question of the naming of geological horizons, as to whether it is desirable to retain in the science an artificial classification based solely upon historical factors or to have a "natural" classification based partly upon general physico-geographical changes common to all the world; partly upon faunal characteristics, and not upon the accidental limits of the different divisions, and named from the country or district where they were first studied. The general opinion of the geologists seemed to be that while the present systems of classification are too complicated and artificial, it is best to make haste slowly, and therefore the following resolution was adopted: "The congress is of the opinion that it is necessary to remain grounded upon the historical method, at the same time trying to render it more and more natural. Furthermore, it charges the

council with the duty of naming a committee to study the principles of classification in the spirit of the main resolution."

The afternoon of this day was occupied by listening to papers on themes relating to general geology, including glaciers. The second general session was devoted to discussing the manner in which new names should be introduced into stratigraphical geology, and after much argument the following resolution was adopted: "1. The introduction of a new stratigraphical term into international nomenclature must be based upon a well-determined scientific need, indicated by peremptory reasons. Every new name must be accompanied by a clear definition—lithological and paleontological—of the beds to which it is applied; at the same time, furthermore, it must be founded upon features observed over a more or less considerable area and not in a single section.

"2. Names applied to a terrain in a certain sense cannot be again employed in another sense.

"3. The date of publication decides the priority of the stratigraphic names given to a series of beds.

"4. For small stratigraphic subdivisions sufficiently characterized by their fossils to deserve new names, it is preferable to take as the basis of nomenclature their most important paleontological characteristics. Geographical terms should be used only when the series includes several paleontological horizons or when the terrain cannot be characterized by its fossils.

"5. Names badly constructed etymologically are to be corrected without being excluded from the science."

At the session devoted to petrography and applied geology a new system for the classification of rocks was propounded by Prof. J. Walther, of Jena. Petrographers are not ready, however, to accept as a whole any fixed classification, consequently they presented a resolution to the congress deferring the matter of nomenclature and got the council to name a committee which should consider the advisability of establishing an international petrographical journal to be devoted especially to summaries and notices of long articles. The American members of the committee appointed are Professors Iddings and Pirsson. Regarding applied geology, four communications were presented. General de Tillo presented the results of an investigation carried on by the Russian Geographical Society into the existence of a depressed area in Central Asia. The expedition proved that such an area exists and found the average reading of the barometer therein to be 766.5 mm., with a maximum of 796.6 mm. The second communication was from the same source, and described two areas in the central part of Russia in Europe with undisturbed paleozoic rocks of considerable thickness, in which the magnetic needles show strange anomalies. One of these areas lies near the villages of Kotchétovka and Pokrooskoje, in the government of Kursk, and in it the declination varies between + 97° (the north end of the compass needle points a little south of east) and - 34°, and the inclination between + 79° and + 34°. The other area lies not far distant, in the same government, and together they occupy a considerable portion of its territory.

A. Lebedinzew then communicated a summary of the results obtained from the expedition of the *Kramorodsk* into the Gulf of Karabougas, a portion of the Caspian Sea, in which beds of rock salt have been said to be forming at the present time. It is now known that such beds are not forming there, but the bottom of the gulf is composed of gypsum, which, in the middle of the gulf, is covered with mirabilite (glauber salts). This phenomenon, at first sight very strange, is explained by the chemical composition of the waters of the Caspian Sea, which contain four times as much sulphate of magnesium in proportion to chloride of sodium as do the waters of the open ocean. These beds of natural glauber salt are being worked at a great profit. Although these deposits of mirabilite are very interesting chemically, the formation of gypsum is of far more importance geologically, as was brought out in the discussion by Prof. Androussow, because it is the only example of the kind known.

One of the important steps taken by the congress was the indorsement of a plan for the systematic study of the bottom of the ocean and the correlation of results by means of an international bureau supported by contributions from all nations concerned and controlling one or more ships thoroughly equipped for all kinds of deep sea work, including accommodations for students as well as investigators. Geographers and biologists as well as geologists are interested in such a project.

Two sessions of the congress were devoted to hearing and discussing papers on stratigraphical and paleontological geology, in which many facts of interest and value to workers in those departments were brought out.

At the last of the general sessions Dr. Persifer Frazer announced that the Philadelphia Academy of Natural Sciences had voted the Haydem memorial medal for special service to geology to Mr. A. P. Karpinsky, president of the congress. The closing session of the congress was held at 1 o'clock on September 5th, and consisted of several complimentary addresses and the customary votes of thanks.

Amid all the work to which the convention was devoted, the social side of the meeting was not omitted by the hospitable Russians. The Czar received personally one representative from each nation, Professor Hall being the one chosen for the United States, and entertained the whole congress one day at the Peterhof Palace. There were receptions also to limited numbers given by the Grand Duke Constantine and by the Duchess of Oldenburg, and one to all by the city of St. Petersburg. Furthermore, the province of Finland gave a grand complimentary excursion to the cataract of Imatia and a dinner there for the whole congress. The exhibitions of maps, specimens, books and instruments made by various governments, institutions, individuals and firms formed a most interesting and valuable adjunct to the congress.

In fact, it is almost impossible to overstate the cordial hospitality with which the delegates were everywhere treated. The reception by all, official and non-official, was of such a nature that it would be impossible to carry away any impressions but favorable ones of the Russian empire and its geologists and miners.

The meeting was followed by the excursion to the Caucasus, in which a large number of the delegates joined. This trip was not concluded until October 5th.

The invitation of the French geologists and government to hold the next session of the congress at Paris during the exposition of 1900 was accepted unanimously. The French committee of organization has for

its president Prof. A. Gaudry, and for its vice-presidents Profs. Michel Levy and M. Bertrand. The committee proposes two alternative excursions before the meetings, one of 12 days in Brittany, the other of nine days in Normandy and the Boulonnais. After the meetings there will be a grand excursion of three weeks to the region of Tertiary volcanoes in central and southern France, and to Mont Blanc.

THE SULLIVAN COAL-MINING MACHINE.

The extension of the use of machines in coal mining has brought forward many new types of such machines, among the more recent being that shown in the accompanying engravings, which is made by the Sullivan Machinery Company, of Chicago. In designing a machine of this kind it is well understood that among the necessities are a valve motion which can be operated from a straight line reciprocating motion, that will adapt itself to a piston stroke of variable length, and should be adjustable to a considerable variation in air pressures. It is also neces-

the speed of the return stroke is kept down so that the runner has time to direct each blow.

These two improvements, the adjustable cut-off and governing device, are the main features of the Sullivan machines. Records of 1,177 sq. ft. undercut in a shift of 10 hours have been made with this machine, which shows its capacity. Fig. 1 shows a side and rear view of the undercutter mounted for use, showing the index pointer on the head used for regulating the cut-off. Fig. 2 shows an indicator card taken from the undercutter while at work. The excellence of the valve motion is shown in the sharp cut-off and true expansion curve.

A few years ago economy of power in a coal mine received but little attention from the operators, but at the present time the methods in use for burning slack have given a market for all the product. This taken together with close competition has led the mine manager to save at every possible point. A coal mining machine must therefore be economical in its use of air, and the cost of repairs must be kept down. It is claimed that this machine meets these requirements. It has few moving parts and these are simple and strong. There are no rubber

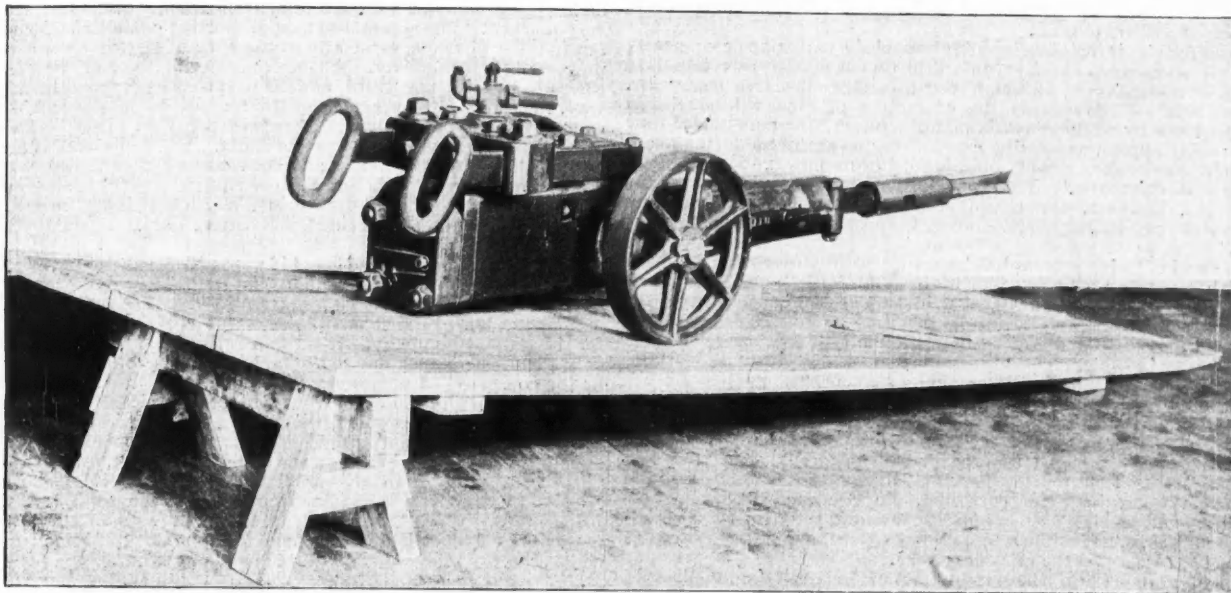


FIG. 1.—THE SULLIVAN UNDER CUTTER FOR COAL MINING.

sary that there should be some arrangement to prevent the piston from striking the head should the pick miss the coal in its stroke. It must also be understood that the machine should be simple, so that it can be run by a miner with little knowledge of machinery, and its working parts must be properly protected from the dust and rough usage incident to the coal mine. In the present machine the valve motion is so arranged that it can be changed from a cut off of one-sixth to one-half the stroke, the change being quickly and easily made by the runner. When the air pressure is high the early cut-off is used, and as the pressure falls the air is made to follow the piston further, thus keeping up a uniform strength of blow.

Another advantage secured by the cut-off arrangement is that when the pick strikes the coal there is little or no air pressure behind it, the

cushions or buffers used, and the front bushing is so constructed that it can be kept in perfect condition at a small expense.

The Resources of Abyssinia—According to the *Bulletin de la Société de Géographie Commerciale*, the mountains of Abyssinia contain gold, copper, iron, salt and numerous deposits of very pure potter's clay.

Alum in New Mexico—The large deposit on the Gila River is now being worked to some extent. With proper railway facilities the governor of the Territory considers that these deposits of alum and those of gypsum and soda in the same vicinity may be worked profitably.

Belgian Emigration to Russia—A large number of Belgian workmen are emigrating to Russia to find employment at the Russo-Belgian metallurgical concerns which have recently been established in the Donetz District. The drain is at present chiefly upon the engineering and allied trades, the Hainault District having been, so far, the chief sufferer. A large amount of Belgian capital is now invested in Russian works.

A New Method of Pipe Laying—According to *Engineering*, a French inventor has made use of a rubber tube as a core on which to mold pipes of cement and sand. To make a continuous conduit in the ground, a trench is dug and at the bottom of this a layer of cement mortar is placed. On this rests the rubber tube, which is surrounded by canvas and inflated. The remainder of the trench is then filled with cement mortar and as soon as this is set the rubber core can be deflated and removed for use elsewhere. It is stated that 6-in. pipes have been made on this plan out of hydraulic lime and sand at a cost of about 22c. per yard.

Diffusion of the Rare Elements—Messrs. W. N. Hartley and Hugh Ramage, in a paper read recently before the Iron and Steel Institute, give the results of spectroscopic investigations of numerous ores from which it appears that the rare elements are much more generally diffused than is commonly supposed. The Bensberg and Pierrefite blends are richest in gallium, while that of Freiberg is richest in indium. Lithium is found almost invariably in iron ores, and its lines occur in the spectra of the Bessemer converter flame. Rubidium is frequent in iron ores. It is a marked characteristic of siderites that they contain gallium. Ores derived from the older rocks, such as bauxites from basalts, contain chromium, nickel and gallium. In clay-iron stones gallium was found in 21 out of 51 specimens examined, chromium frequently and nickel occasionally occurring with it. Thallium is rare in oxide ores, but is frequent in pyrites. Indium is not uncommon in pyrites, but gallium is comparatively rare.

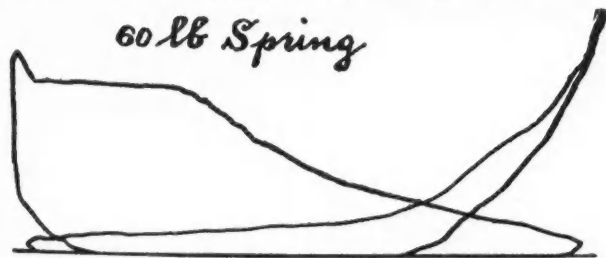


FIG. 2.—INDICATOR CARD—TAKEN FROM SULLIVAN UNDERCUTTER.

moving piston and rod having absorbed the energy contained in the compressed air. The motion is rapid and the pick gives a quick, sharp blow, which breaks the coal, but with little shock to the machine itself.

The main valve is of the slide-valve type, being operated by a differential piston valve. This latter valve is in turn moved by the pressure of the air, the time depending upon the relative position of the piston in the cylinder, and the index pointer on the rear head. The change of cut-off is accomplished by simply moving the pointer shown in Fig. 1 up or down until the machine strikes the proper blow. Any runner, no matter how ignorant, can work this without the least knowledge of the mechanism of the machine.

Another feature of the machine is the governing check valve, controlling the inlet port leading from the air chest to the forward end of the cylinder. The instant the pick fails to hit the coal, this check valve holds an air cushion which takes up the shock and prevents the piston from hitting the front head. It is automatic in its action, and prevents any increase in the speed of stroke when the machine is being moved about on the board and when it is not striking the coal. By this means

THE ENGLISH CHEMICAL INDUSTRY.

The 23d annual report of the Chief Inspector of Alkali Works in the United Kingdom, Mr. R. Forbes Carpenter now filling this position, shows that in 1896 the number of alkali works was 98, against 101 in 1895; fiber separation works increased from 38 to 44; arsenic processes decreased from 44 to 37, and "other works" increased from 964 to 976. An abstract of this report is given in *The Journal of the Society of Chemical Industry*, August 31st.

The inspector states that in 1896 the manufacture of caustic soda and chlorine by electrolysis was chiefly experimental, but progress was made at the works of the Castner-Kellner Alkali Company for starting in the present year, and the Hargreaves-Bird electrolytic process is to be conducted at Chauny by the St. Gobain Company. In the manufacture of chlorate of soda, Mr. J. Hargreaves has applied on a large scale his process for chlorinating hydrated sodium carbonate directly in an absorbing tower, in which lixiviation of the products to remove sodium chlorite is also conducted, the intermediate production of calcium or magnesium chlorate being avoided. In France, Germany, Switzerland and Sweden, it is stated that processes for the direct electrolytic formation of chlorates have received wide extension.

Processes for obtaining chlorine simultaneously with zinc or copper by the electrolysis of zinc or copper chlorides do not appear as yet to have been tried on a large scale, although the inspector considers that "Dr. Hoepfner's processes, as regards the extraction of zinc, will be tried in the first instance by ammonia-soda manufacturers, to whom indeed they would strongly appeal, as offering a promising means of rendering available the chlorine of the calcium chloride solution now run to waste in such enormous quantities." We may add that since the beginning of the present year, however, the Hoepfner process has been exploited on rather a large scale by Brunner Mond & Company, at Winnington, near Chester.

A nitric acid chlorine process has been successfully carried out in Middlebrough, bleaching powder of the highest strength having been produced; but there is a serious drawback in the cost of concentrating the large quantities of weak sulphuric acid resulting from the decomposing operations. It is suggested that the Kessler plant for rectifying the acid would prove serviceable. The "Kessler" plant is described as working well and with great regularity. An acid of about 97% monohydrate is produced, not of the best "color and brightness," but well suited for application in nitrating and in some other operations.

The continuous processes adopted for rectifying sulphuric acid in glass, porcelain, or enameled iron beakers, stepped in series, have not given entire satisfaction to the inspector, owing to the liability to the escape of acid by breakages or corrosion. In Scotland, the production of sulphuric acid has been active, notwithstanding the restricted condition of alkali works, as is shown by an increase of the quantity of pyrites burned of 1,817 tons over the preceding year.

The loss of ammonia in the production of soda-ash (ammonia-soda process) has been reduced, but is still equal to 2% of sulphate per ton of 58% alkali, which is equivalent to the loss of 5,395 tons of sulphate of ammonia for 1896. An increasing amount of ammonia is used in the manufacture of cyanides.

The amount of salt decomposed in the Leblanc and ammonia-soda processes (including Scotland) was as follows;

	1894.	1895.	1896.
	Tons.	Tons.	Tons.
Leblanc process.....	434,298	408,173	360,929
Ammonia-soda process.....	361,603	428,014	431,577
Total.....	795,901	836,787	792,506

The production of sulphate of ammonia, inclusive of that lost or applied in manufacture without going upon the market, was as follows:

	1894.	1895.	1896.
	Tons.	Tons.	Tons.
Gas works.....	113,634	119,645	127,493
Iron works.....	10,475	14,588	16,511
Shale works.....	32,891	38,335	37,822
Producer-gas, coke, and carbonizing works.....	3,448	7,083	9,078
Total.....	160,048	179,651	190,909

The ammonia from gas works did not increase so much as might have been expected from the increased production of gas. This is attributed to the introduction in part of the gas derived from the interaction of incandescent coke and steam, from which no ammonia is obtained. In America this displacement of coal gas has reached more than 70%; and it is anticipated that the displacement will go on in the United Kingdom at an increasing rate, even if there be more danger of poisoning from carbon monoxide with the water gas than with the coal gas. There is a prospect, however, that the supply of ammonia from other sources will be increased. In the large iron works at Merthyr and Dowlais, in South Wales, where hitherto by-products have not been collected, changes in the machinery make it probable that in the future tar and ammonia will be recovered. The successful development, also, of Dr. Mond's process for recovery of ammonia from gaseous fuel used in melting steel is referred to. In shale distillation, the introduction of the "Pentland" retort of Messrs. Young & Beilby, in 1884, appears to have been the means of the salvation of the Scotch oil trade. An improved form of the Pentland retort has been introduced during the year, for which it is claimed that no additional fuel for distillation is required beyond the gases derived from the retort itself.

The experiments conducted at the works of the Luton Gas Company in using oxide of iron purifiers, with concurrent revivification by regulated steam and air admission, have been continued during the year, and a table is given of the results of analyses of the samples taken. Artificial oxide gave a very prolonged run without fouling, but the working throughout shows loss of available sulphur. Mixed Flitwick and Irish bog ores gave better results than the Flitwick used singly. In another works, where the method of alternate downward revivification without steam is in use, with three hours' spells of work, a sample of oxide from

the lower part of the purifier, worked for six months, gave 55.66% of total sulphur, of which 82.3% was free or available.

A new change valve has been introduced at the Richmond Gas Company's works, which it is easy to lift and turn, and at no time is the foul gas main unsealed, so that no escape of hydrogen sulphide can take place during change.

An elaborate investigation into the constitution of ammoniacal liquors has been conducted, the results of which are tabulated, and the methods of analysis used are described. High commendation is given to Mr. F. Lennard's continuous tar still, two units of plant of which deal daily with 16,000 and 24,000 gals. of tar respectively. The freedom from nuisance is said to be absolute, and "the pitch is delivered in a constant stream, which can be cooled to any desired degree before appearing in the open on the pitch bays." One plant is already at work on the Continent, and another is being erected in Scotland.

COAL MINING IN INDIA.

It is gratifying to note, says *Engineering*, that there is a steady increase in the amount of coal mined in India. Recently this has been very marked. The preponderating proportion come from Bengal mines, but in other districts, especially in the Nizam territory, coal winning is proceeding satisfactorily. A large quantity of the coal mined is used on the railways—about a third, and, as in the case of the East Indian Railway, the mines are worked mostly for the locomotives; but even this company sells to the public at 3½ rupees per ton. This probably represents a fair average selling price in India. The same coal is put down as costing the railway company at a convenient center 2 rupees per ton between January and April and 1 rupee 2 annas per ton between May and December. As to the calorific value, Welsh coal is 25% better than this Bengal coal, while patent fuel is 43% better; but it is about the best coal found in India.

At Bombay, English coal costs 16 rupees 8 annas to 17 rupees 2 annas, while the Bengal coal sea-borne to that port costs only 12 rupees 8 annas to 14 rupees 8 annas; so that viewed from its value as a fuel, even at Bombay, it competes with English coal. Singareni coal, however, is the cheapest for the railway company. It is practically as good as Bengal and costs only 4 rupees 8 annas, due to the fact that it is found in the area served by the company. In Madras wood is still much used, the coal being 13 rupees per ton and the wood from 3 to 6 rupees; coal is not double the calorific value of the wood, although for other reasons it is preferable. The same applies to Burma. There has been a steady increase in the amount of Indian coal used on the lines, and now it amounts to 1,174,039 tons—5.16% more than the previous year; while English coal has decreased by nearly a corresponding amount, the total being now only 106,599 tons. Wood has increased to 321,052 tons, or about 10,000 tons; but patent fuel has decreased from 4,097 tons to 1,664 tons in one year, while coke has increased from 3,140 to 4,344 tons.

Blast Furnaces in Belgium.—At the commencement of the present month there were 35 out of the 44 existing blast furnaces in operation in Belgium—15 in the Charleroi District, 14 in the Liege District and 6 in the Luxembourg District. The output per 24 hours of the blast furnaces in operation is: Fourteen, 1,255 tons of forge pig; three, 195 tons of foundry pig, and 18, 1,400 tons of steel pig.

The Nitrate of Colombia.—The average composition of the crude nitrate (*caliche*) from the deposits in the United States of Colombia, discovered by Mr. I. Caracristi, is as follows: Sodium nitrate, 11.4%; calcium carbonate, 32.5%; calcium sulphate, 20.1%; silica, 32.4%; calcium phosphate, 2.5%; ferric oxide, 1.0%; organic matter, 1.0%. The *caliche* will have to be washed to extract a commercial nitrate.

The Price of Pottery Clay.—Importers of English and French clays, which are used in all the fine American pottery ware made, have given the manufacturers notice of an increase of 15% to 35% in the prices of all imported clays. East Liverpool manufacturers announce their intention, according to the *Clay Record*, of giving Kentucky and Carolina clays a trial, and using domestic clays where possible.

Recovery of Gold from Black Sand.—George M. Thompson and John J. Cusic, of Butte, have invented a new machine for this purpose. It consists of a smooth steel plate perforated and counter reamed on the under side. In ground sluicing the fine gold and black sand pass through this into a sub-slucice. The concentrates then flow over copper plates into a hopper and then to a tank, where they are made to pass through mercury in which the gold should be amalgamated, while the black sand can be skimmed from the surface.

Brick Making in Western Pennsylvania.—The Brickmakers' Association of Western Pennsylvania held a meeting at Pittsburg recently to organize an association for the improvement of trade. From the opinions expressed at this meeting, it is likely that such an organization will be effected. The brick yards of Western Pennsylvania are said to have a daily capacity of about 600 M. In the vicinity of Pittsburg there are about 40 firms with an output of over 300 M. per diem. The price of brick in that city has lately fallen so low that there is said to be no profit in the manufacture.

Colorado's Gold Output for 1897.—The mining committee of the Denver Chamber of Commerce recently reported to that body that the output of gold in Colorado for the first six months of 1897 was \$9,664,181, as against \$7,433,986 for the same period, 1896; and that never in the history of the State has there been a time when there was so much activity displayed in the production of gold or so many men employed therein. These statistics were collected by the Chamber of Commerce with the co-operation of the State Commissioner of Mines, but we are uninformed as to the method employed.

THE WANGSHIK'ANG IRON MINES IN CHINA.

According to an article in the *North China Daily News* of March 4th last, the Wangshik'ang mines are 18 miles inland from Huiyao, a small village on the Yangtze River about 80 miles below Hankow. A short line of railway connects Huiyao and the mines. About 200 tons of iron ore are brought down daily to the smelting works founded by the Viceroy Chang Chih-tung at Hanyang, which lies directly above Hankow. At the terminus of the railway is T'iehshan, or Iron Hill, which is a natural wonder, being composed entirely of ironstone containing from 75 to 80% iron. The adjacent hills also abound in iron ore, containing from 40 to 70% iron. There is, however, so much phosphorus in the ore that its selection for conversion into good steel is a matter of some difficulty. A cable tramway runs up and down the Iron Hill. A shaft has been pierced into the heart of the hill and has revealed thick lodges of ore extending far inwards.

Nature has also endowed the locality with vast stores of limestone. The great initial difficulty under which the iron and steel works at Hanyang labored was the scarcity of coal. Coal has, however, been discovered at Wangshih-teng, near the iron centers. This coal, although very suitable for steaming purposes, will not make good coke. An abundance of coal which will, however, give good coke has been found at no great distance to the westward of T'iehshan. The dearth of coke at Hanyang so seriously hampered the steel and iron workers there that large supplies had at first to be imported from Europe at great expense. The foreign staff maintains confidently now that the whole of this district will bear comparison with the coal and iron fields in other parts of the world.

To a mere observer it seems strange why the steel and iron works at Hanyang, with their new and expensive machinery, were not established at a spot nearer the coal and iron centers. The present site is unhealthy and liable to be flooded. A great deal of money and labor has, therefore, been spent in filling up the low-lying land and in building embankments. Then, again, the cost of transport of the ore is considerable. What is of more account, however, is that the quantity of coal and limestone shipped at Huiyao and the quantity discharged at Hanyang vary in such an apparently mysterious and unaccountable manner that any stranger, who was not conversant with the meaning of the two words "mandarin" and "squeeze" would be totally mystified. It is probable that His Excellency Chang Chih-tung was anxious to have his new undertaking under his eyes. He spent his money freely and did not spare himself in his endeavor to make China independent of other countries as regards manufactured steel and iron, but he failed. It would be hard for Shêng to do worse.

Concerning the information above, a recent report made by Hon. Charles Denby, United States Minister to China, to the State Department, says: "This correctly states that the great initial difficulty under which the steel and iron works at Hankow labored was the scarcity of coal. It is now learned from reliable professional sources that recently discovered fields of coking coal have removed this difficulty. This discovery is very opportune for the railroad prospects of China. The ambition of Chang Chih-tung, Viceroy of Hukwang, that China should build her railroads with rails of domestic manufacture, seems within the possibility of realization. The staff of his iron works includes Germans, Belgians and Americans, and with the natural resources at their command nothing should prevent their success except the factors hinted at in the conclusion—'mandarin' and 'squeeze,' between which there seems an affinity, which works detrimentally to every public enterprise in China."

The Production of Iron Ore in New Jersey in 1896 was 264,999 tons, which was about 6% less than in the previous year.

European Colliery Accidents.—According to *Glückauf*, the average annual number of fatal accidents in the years 1891 to 1895 per 1,000 men employed in collieries was as follows: In France, 1.099; Belgium, 1.664; Great Britain, 1.536; Prussia, 2.493. About 40% of these accidents were due to falls of roof and sides.

Stamp Battery Construction.—According to the *Mining and Scientific Press*, in the construction of a new 40-stamp mill in Amador County, Cal., five concrete piers are added to the timbers for each 20 stamps, thus admitting replacement of knee frame, knee-beam timbers, knee-beam posts and mortar blocks without shutting down more than five stamps.

The Quincy Granite Quarries.—Thomas F. Burke, of Burke Bros., Quincy, Mass., says that it costs less to quarry granite at Barre, Vt., than at Quincy, Mass., because the Barre quarries are nearer the surface. What costs \$1 a cubic foot at Quincy costs only 50c. or 60c. at Barre. They can get out almost anything at Barre for about \$1, while at Quincy the cost runs as high as \$3. The Quincy production is estimated at about 200,000 tons per annum, while that at Vermont is put at 100,000. The Quincy quarries produce every shade of stone from red to very dark blue, the intervening shades being pink, gray and light blue. At Westerly, R. I., there is only pink stone, running to gray. The Quincy granite takes a high polishing and retains it.

Calcium Carbide Residues as Antidote to Phylloxera.—E. Chaurd, in *Comptes Rendus*, 124, 1247-1248, states that among the products of decomposition of calcium carbide by water are small amounts of ammonia, which come off in greater quantity after the whole of the acetylene has been evolved than before. The residues from acetylene preparation are thus valuable as a fertilizer, and they also serve as an insecticide. Attempts have been made in Spain, and lately by the author, at Veyrier (Haute-Savoie), to treat vines with these residues for phylloxera, with considerable success. The toxic properties seem to be due in part to the presence of traces of phosphine in the evolved gas, and experiments made by the author with a specially prepared carbide containing a notable amount of phosphine (not enough to render the evolved gas spontaneously inflammable), have been very successful, the substance having proved a very powerful insecticide, while as a destroyer of phylloxera it seems also, as far as the experiments have yet gone, very hopeful.

PERCARBONATE OF POTASSIUM.

A. von Hausen, in *Zeitschrift für Elektrochemie*, 1897, 3, 445-448, and *Journal of the Society of Chemical Industry*, August 31st, 1897, p. 679, describes the preparation and properties of percarbonate of potassium. This salt is obtained from potassium carbonate by electrolyzing a concentrated solution of potassium carbonate at a low temperature, from 0° to 15° C. The clear solution in the neighborhood of the anode becomes milky, owing to the separation of percarbonate, and by filtering off, a salt of sky-blue color is obtained. This is potassium percarbonate, containing a few per cent. of potassium carbonate as an impurity.

The pronounced blue color of the moist salt disappears almost entirely on drying. It is easily decomposed, yielding up oxygen to oxidizable bodies. In order to decompose it in a short time by heating a temperature of 200°-300° is requisite. On immersion in water it only slowly decomposes at ordinary temperatures. But at somewhat higher temperatures it rapidly decomposes with evolution of oxygen; in fact, it is a convenient laboratory source for preparing pure oxygen. The salt has only to be placed in water and warmed to about 45°; a very steady current of oxygen then comes off. The reaction goes on of itself without need of any further heating, and scarcely a trace of percarbonate is left. One hundred grams of the salt give about 5 liters of oxygen. In order to retain any carbon dioxide that may be developed soda is added to the water.

Like the peroxides of sodium, barium and hydrogen, it can be used as an oxidizing agent. By adding it to diluted acids a more or less concentrated solution of hydrogen peroxide is obtained. If an excess of acid be present, the solution keeps well. The dry percarbonate keeps very well, and is a convenient source for rapidly preparing a solution of hydrogen peroxide. Potassium percarbonate cannot be crystallized from its aqueous solution. If water at 0° be saturated with it and then cooled to -15°, a rich crop of crystals separates out, but these consist mainly of ice. It is, however, only slightly soluble in alcohol; and by making use of this property it can be purified as follows: An excess of the salt is added to a strong solution of caustic alkali and is digested with it for some time at -5° to -10°. The bicarbonate contained in the salt is decomposed by the alkali. The potash produced goes into solution, and, after filtering, percarbonate containing only a small quantity of caustic alkali as impurity is obtained. By treatment with absolute alcohol this is removed and a product containing 95 to 99% of percarbonate is obtained.

Kansas Gypsum.—E. H. S. Bailey and W. N. Whitten, in the *Kansas University Quarterly*, 6, 29-34, gives 12 analyses of gypsum from Kansas. These show that the material is in the main of a high degree of purity, the majority of the analyses closely approximating the theoretical composition of gypsum. The chief impurities are calcium and magnesium carbonates.

Analyses of Infusorial Earth.—F. W. Smither, in *American Chemical Journal* 19, 235-236, reports three analyses of infusorial earth from Richmond and King George counties, Va., and Calvert County, Md. The second is of exceptional purity, containing 65.83% of amorphous silica. The chief impurities are quartz and clay, with only traces of lime and magnesia.

Notes on the Estimation of Cyanogen by Silver Nitrate.—By William J. Sharwood in *Journal American Chemical Society*, 19, 400-434, presents the results of an exhaustive study of the estimation of cyanogen by silver nitrate. The results cannot well be summarized, and reference should be made to the original article. This subject is of much importance in cyanide mill work.

Sodium Peroxide as a Third Group Reagent.—S. W. Parr, in *Journal American Chemical Society*, 19, 341-346, states that sodium peroxide throws down from a nitric acid solution of the sulphides of the group, iron, manganese, cobalt and nickel, while the zinc, aluminum and chromium remain in solution, the latter undergoing oxidation to chromate, thus avoiding interference with the zinc. A scheme is given for the further separation of these metals.

The Firth Patent Prop for Collieries.—This consists of a rolled steel girder, with a portion of the web cut away and the ends turned over so that they present a flat surface at least equal to that of the usual timber prop, holes being punched in the web so that a hoop may be inserted for drawing. This is used in several collieries in Nottinghamshire. The first cost of steel props is of course greater than that of wooden props, but the ultimate cost may be much less, in England at least.

The Mt. Lyell Copper Mines.—The success of the Mt. Lyell Company has stimulated the exploitation of other mines in the same district, and numerous companies, which have been widely advertised in London, have been organized for this purpose. The report of the Secretary for Mines of Tasmania for the six months ending June 30th, 1897, which we have just received, gives us reliable information as to what these companies are doing. The North Mt. Lyell is said to have prospected systematically its property with encouraging results, the existence of a large body of ore similar to that of the Mt. Lyell mine having been proved. The Central Mt. Lyell has been tested by the diamond drill and is found to contain a deposit similar to that of the Mt. Lyell company. The King Lyell has produced a considerable amount of copper ore as the result of exploration work which has been carried on. Work has been done on the Mt. Lyell Comstock, the Tasman Lyell, the Lyell Tharsis, the West Lyell, Prince Lyell, South Lyell, Lyell Pioneers and Linda Lyell. The great demand for labor in this district now has practically put a stop to alluvial gold mining there. The total exportation of blister copper from Tasmania for the year ending June 30th, 1897, was 1,928 long tons.

PERSONAL.

MR. R. A. F. PENROSE, JR., and Mr. JOHN BROCKMAN, mining engineers from Arizona, are in San Francisco.

MR. WILLIAM CHURCH, of Denver, is visiting Utah and Montana, in both of which States he has mining interests.

MR. GOMER THOMAS has been appointed Coal Mine Inspector of the State of Utah, to succeed Mr. THOMAS LLOYD, resigned.

DR. SOMMERFELD, of the University of Göttingen, Germany, has been appointed Professor of Mathematics at the Bergakademie at Clausthal.

MR. O. R. YOUNG, a well-known Utah engineer, has returned to Salt Lake from a two months' outing in the East of combined pleasure and business.

MAJOR GENERAL WEBBER, of the British Columbia Bullion Extracting Company, has, after a short visit to the Trail Creek District, left for his home in England.

MR. GEORGE KISLINGBURY, who found the De Lamar Mercur mines, is examining a gold property in the Blue Mountains, Utah. From there he will probably go to Colorado.

MR. RALPH NICHOLS, a mining engineer of much experience in the Rocky Mountain region, is on his way to London and from there will go to Australia for a British syndicate.

PROF. WILBUR C. KNIGHT has recently visited the mines near Cheyenne, Wyo., for the purpose of examining the methods there adopted in using the cyanide process for treating the ores.

MR. R. G. MCCONNELL, chief of the topographical survey of Canada, who has been at work on the geodetic map of the district from Slocan to Boundary and Rossland to Kootenay Lake, will shortly leave for Ottawa.

MR. A. C. WASHINGTON, president of the Horn Silver Company, was in Utah to attend the annual meeting of the company, which took place on Tuesday of this week. Before returning to New York he will visit Austin, Nev.

MR. J. PACHIHARA, chief electrical and mechanical engineer of the Pakashima coal mine and several other properties in Japan, has recently been examining the electric haulage system of the Mt. Lookout colliery near Pittston, Pa.

MR. J. C. YAWGER, formerly manager of Victor Bishop & Company, has succeeded to the business of that concern as importer and manufacturer of black diamonds and bort, and continues to carry on that business at 21 Maiden lane, N. Y.

DR. F. W. IHNE, mining engineer of Chicago, has returned to that city after investigating gold mines in Colorado, New Mexico and Old Mexico for a German syndicate. He will shortly visit Joplin, Mo., where he will examine a zinc mine for Chicago people.

JUDGE JACOB B. BLAIR, of Salt Lake, recently appointed surveyor-general of Utah, assumed the duties of the office October 1st. He succeeds Mr. GEORGE W. SNOW, a civil and mining engineer, who has performed the duties of his office very satisfactorily.

MR. G. M. GOUYARD, formerly purchasing agent for the Puget Sound Reduction Company, of Everett, Wash., has been engaged by W. H. H. Llewellyn to construct a 40-ton Pelatan-Clerici process plant at Faulkner, Sierra County, N. Mex., and will commence operations at once.

MR. W. WESTON, mining engineer, of Cripple Creek, Colo., has just returned from Grand Encampment Mining District, in Wyoming, where he went to report on the mineral resources of that region. He was accompanied by Mr. R. F. WEITBREG, one of the pioneers of railway construction in Colorado, and also by one of the emigration agents of the Union Pacific Railway.

OBITUARY.

JOHN PETERS, one of the pioneers of the Hanging Rock iron industry, died on September 22d, at Ironton, O., aged 84 years. For 50 years he had been an active figure in that region, and was interested in a dozen of the leading furnaces, foundries and mills which have made the region famous during that period.

GEORGE H. LEWIS, who died in Buffalo, N. Y., October 2d, aged 57 years, was for many years engaged in business in that city, and had amassed a considerable fortune. He was largely interested in coal properties in Western Pennsylvania, and was for several years president of the Bell, Lewis & Yates Coal Company.

WILLIAM E. COBLEIGH, mine contractor and superintendent, died at Wilkes-Barre, Pa., on October 3d, aged 70 years. He was born near Bristol, England, October 26th, 1827, and was educated in Wales. He came to America in 1857 and was engaged as a mine contractor in Schuylkill County until 1865, when he came to Plymouth to superintend the Lance colliery for William Lance. When the Lehigh & Wilkes-Barre Coal Company acquired pos-

session of this property Mr. Cobleigh accepted a position as mine foreman with the Delaware & Hudson Canal Company, at Nos. 1 and 2 collieries, Plymouth, where he remained for nearly 15 years, when he retired to private life.

SOCIETIES AND TECHNICAL SCHOOLS.

ENGINEERS' CLUB OF CINCINNATI.—The regular meeting of the club was held September 16th with 15 members present. Mr. A. O. Elzner read a paper on "The Dwelling House from a Sanitary Point of View."

AMERICAN CHEMICAL SOCIETY, NEW YORK SECTION.—The annual meeting will be held in the Chemical Lecture-room of the College of the City of New York, October 15th, at 8:15 P. M., when officers will be elected, and several addresses made.

COLUMBIA UNIVERSITY.—The 14th academic year of this university opened on Monday, October 4th. Dr. Alexis A. Julien has been placed in charge of the collections of economic geology and petrography. Mr. William C. Uhlig, who was recently appointed an assistant in analytical chemistry, has resigned the place.

NEW YORK ACADEMY OF SCIENCES.—The Section of Geology and Mineralogy will hold a regular meeting at the Mott Memorial Library, 64 Madison Avenue, October 18th, when reports will be presented by R. S. Dodge and D. G. Martin on "Geology at the Toronto meeting of the British Association," and by J. J. Stevenson on the "International Geological Congress in St. Petersburg."

MONTANA SCHOOL OF MINES.—Ex-Governor Rickards has been successful in collecting the necessary funds for the establishment of this school at Butte. Contributions were made by banks, business firms and individuals, and the total subscribed was \$33,800. Among those who contributed were the Boston & Montana Company, \$2,000; the Butte & Boston Mining Company, \$2,000; W. A. Clark & Brothers, \$2,000; F. Aug. Heinze, \$1,000, and Frank Klepetko, \$1,000. It is estimated that \$7,500 more will be required to equip the school building.

SHEFFIELD SCIENTIFIC SCHOOL OF YALE COLLEGE.—This school opened for the year on Thursday, September 30th. There were several changes in instructors. Assistant Professor Louis V. Pirsion has been appointed professor of inorganic geology. Charles E. Beecher, assistant professor of historical geology, has been promoted to a University professorship in this subject and has been made a member of the Governing Board of the Sheffield Scientific School. Professor Beecher will also have charge of the geological work in the graduate school. James Locke has been appointed instructor in chemistry.

MONTANA SOCIETY OF ENGINEERS.—The regular monthly meeting was held in Helena, September 11th. President C. W. Goodale appointed Messrs. F. L. Sizer, of Helena; John Herron, of Marysville; and Elliott H. Wilson, of Butte, as a committee to nominate officers for the ensuing year. The society voted to unite with the Society of Montana Pioneers in ordering from the *Journal of the Association of Engineering Societies* 500 copies of the memoirs of the late Col. de Lacy. The subjects discussed were mining operations, tunnel rights, and the action of mineral in the water of mines upon the pumps and pipes. Mr. Goodale stated that after a considerable amount of experimenting he has succeeded in partially obviating the difficulty by treating the water before entering the pipes. Members will find a complete set of the *Journal*, all bound, in the Butte Public Library; also in the Helena Public Library, with the exception of Vol. I, these libraries having obtained the early volumes by purchase. Mr. C. W. Goodale will endeavor to complete a set of the *Journal* for the School of Mines, at Butte.

INDUSTRIAL NOTES.

The Logan Iron and Steel Company, of Burnham Pa., has resumed active operations.

The Standard Steel Works, of Burnham, Pa., are now running on double time, and the plant is being enlarged.

The Lebanon (Pa.) Boiler and Machine Company has gone on double time, a heavy press of orders necessitating this.

The sale is reported of the Irondale Furnace property at Independence, W. Va., for \$6,200. The original cost was \$212,000.

There was an explosion recently at the mills of the California Powder Works at Santa Cruz which destroyed several of the buildings.

The contract for the new buildings of the West Leechburg (Pa.) Iron and Steel Company has been let to Riter & Conley, of Pittsburg.

The old plate mill of the Lukens Iron and Steel Company at Coatesville, Pa., was recently destroyed by fire; loss, from \$40,000 to \$60,000.

The Temple, Pa., Iron Company is making excavations for an additional blast furnace. It is now shipping from 800 to 1,000 tons weekly.

The Buhl Steel Company, Sharon, Pa., is adding

another soaking pit to its plant. For the present this concern is running single turn only.

The Shamokin & Mt. Carmel Iron Works, of Shamokin, Pa., have increased their working forces, and are working 15 hours per diem.

The Colorado Fuel and Iron Company will build a large addition to its plant at Pueblo, Colo., to manufacture structural, bar and sheet iron.

The S. R. Smythe Company has recently built an open hearth steel plant for the Braeburn Steel Company, at Braeburn, Pa., which is now ready for operation.

The large anthracite furnaces at New Ringgold Schuylkill County, Pa., are being torn down to give place to improved buildings with improved machinery.

The Carnegie Steel Company on October 7th shipped half of the diagonal armor for the battleship *Alabama*, now building at the Cramp ship-building yards.

The exclusive right to manufacture and sell the Moyes patent combined safety tube boiler has been secured by the Phoenix Iron Works Company, of Philadelphia, Pa.

An iron foundry is to be established at Moro, Ora. Articles of incorporation have been filed, the incorporators being William Henrichs, Dr. J. M. Smith and D. C. Ireland.

The galvanizing works of the Struthers Iron and Steel Company, at Struthers, Pa., have been completed. The plant will furnish employment to a large number of men.

The Berger Manufacturing Company, of Canton, O., is to add a tin-plate mill to its large establishment. The plate is to be rolled by the Dennison Rolling Mill Company.

The Second street foundry of the Dayton Malleable Iron Works, at Dayton, O., has been put in operation with a full force of 75 men. This department has not been in use for nearly two years.

The Laughlin Nail Company, Wheeling, W. Va., manufacturers of cut nails and spikes, tin andterne plates, with plant at Martin's Ferry, O., states that it is considering the erection of six more hot mills.

Furnace F of the Carnegie Steel Company, at Braddock, Pa., has been blown out for repairs after continuous operation for two years. Its capacity will be enlarged in the remodeling of the next three months.

The American Tube and Iron Company, at Youngstown, O., has notified its employees of an increase in wages of 10% to take effect Monday, October 25. This restores a reduction of 10% made in wages some months since.

The promoters of the new sheet mill to be operated on a co-operative plan, at Scottdale, Pa., have finally fixed on plans, and the prospects are that work on the new mill will begin within a week or two. Over \$140,000 has been subscribed.

J. Wood & Bros. Company, of Conshohocken, Pa., is now constructing a new 72 in. three-high plate mill which will turn out plates 67 in. wide and down to 12 gauge. This mill will add 8,000 gross tons annually to the firm's present output.

It is rumored that the Granite City Rolling Mill, at Venice, Ill., will soon be transformed into steel works. The steel plant, under the management of Mr. McRoberts, at Granite City, has orders justifying the running of the works day and night.

The Ohio Tube Company, at Warren, O., notified its employees recently of a 10% advance in wages to take effect on Monday, October 25th. Immediately upon receipt of notice the employees went out on strike, demanding that the advance take effect at once.

William Sellers & Company, Incorporated, Philadelphia, have just closed a contract to furnish the Bethlehem Iron Company with one 75-ton traveling crane with a 20-ton auxiliary hoist, one 20-ton traveling crane with a 5 ton auxiliary hoist, and one 10-ton traveling crane.

Top Mill Furnace of the Wheeling Steel and Iron Company, at Wheeling, W. Va., which has been idle for a very long time, is being prepared for blast. This concern has a very large tonnage entered on its books for billets and is badly in need of additional Bessemer pig.

The nail works of Phillips, Townsend & Company, at Glenwood Avenue and Pennsylvania Railroad, in Philadelphia, Pa., were destroyed by fire recently. This is the second destructive fire at these works in two years. The loss amounts to about \$35,000. About 60 men are thrown out of employment.

The seventh monthly report of George S. Griscom and H. E. Anderson, receivers of the Pennsylvania Lead Company, at Pittsburg, was filed recently. The net gain for August was \$1,488, making the total gain up to date \$106,064. The balance of cash on hand amounts to \$45,935, and the total assets amount to \$2,284,680.

The annual meeting of the stockholders of the Webster, Camp & Lane Machine Company, Akron, O., was held recently. John McGregor was elected president and treasurer; S. H. Pitkin, secretary and general manager, and J. W. Chamberlain, superin-

tendent. The company is operating its plant full time and has considerable work on hand.

The reorganization of the Columbus & Hocking Coal and Iron Company, Columbus, O., which, under the recent agreement between the bond and stockholders' committees, is now about accomplished without the necessity of foreclosure, finds the company with a fixed charge of about \$50,000. The 5% preferred stock, under the reorganization, is \$140,000.

Fred. W. Ensworth, president of the Greenville (Pa.) Tube Company, has resigned, and H. A. Lozier, of Cleveland, has been elected president. The mechanical department has been placed in charge of R. C. Stieffel, patentee of the weldless tube process. New machinery will be erected for the making of larger tubing and the capacity of the plant enlarged.

At the annual meeting of the stockholders of the Akron Iron and Steel Company, Akron, O., recently it was decided to sell the plant. The shafting department was burned on Sunday, July 4th, and since that time the entire plant has been idle. It is expected a new company will be organized which will rebuild the destroyed portion of the plant and put the entire works in operation.

Comstock, Cheney & Co., of Ivoryton, Conn., are erecting a fireproof building about 50 ft. long. The side walls of this building are brick and the roof is constructed of iron. The covering is corrugated iron lined with the Berlin Iron Bridge Company's anti-condensation fireproof roof lining. That company also furnishes and erects all of the steel work of the roof.

At Ironton, O., the sheriff sold for taxes recently the Ironton Furnace, known locally as the Iron and Steel Furnace. The furnace was built in the early '70's and cost \$100,000. It has never been run at a profit. To-day the stack is valuable only as scrap. The property adjoins the Eagle Mill and was bid in by Col. H. A. Martine, president of the rolling mill company, for \$2,000. The taxes were \$1,400. The owners have two years in which to redeem the property.

Negotiations are under way looking to the organization of a stock company which will take over the mills of the Atlantic Iron and Steel Company, Sharon, Pa. These consist of the New Castle Works, at New Castle, Pa., and Atlantic Works, at Sharon, leased by P. L. Kimberly & Co. This concern has been in the hands of receivers for some time, Edwin N. Ohl being appointed to that position. The concern also owns a blast furnace at New Castle, which is in operation.

Fire, on October 6th, in the separating house of the Guggenheim Smelting Works near Perth Amboy, N. J., caused the loss of \$700,000. The fire started in some rubbish, and before the four men who were at work in the place discovered it the flames had spread to the roof. The plant had been running only a month. It was a low, one-story building, about half a block square. The company had been two years building and equipping it. Considerable gold and silver was in the separating tanks when the fire started.

The Pottsville (Pa.) Iron and Steel Company, which went into receivers' hands several months ago, has formulated plans of reorganization by which the plant may resume work and give employment to 1,000 hands. It is proposed to issue first mortgage bonds amounting to \$350,000 with which to rehabilitate the mill and for a working capital. The preferred creditors will accept second mortgage bonds to satisfy their claims of about \$150,000, and the unpreferred creditors will receive \$450,000 in preferred stock.

It is stated that a syndicate has been formed in Boston, Mass., under the name of The New England Gas and Coke Company, to take over the charter of the Massachusetts Pipe Line Company, and to commence at once the erection of a coking plant of 300 ovens. Land has been secured in Everett and Chelsea on the Boston & Albany and the Boston & Maine railroads, comprising in all about 250 acres. The coke has been used by the New Haven road, and has been pronounced satisfactory for railroad purposes. The company has contracted with the Dominion Coal Company for its supply of coal.

The Edward P. Allis Company, Milwaukee, Wis., have recently closed contracts for foreign orders aggregating \$500,000. Twenty one engines of an average of 1,200 H. P. each are to be built for foreign trade, including six engines of 1,500 H. P. each for the Central Underground Railway, London; six for the Dublin Tramways of 1,000 H. P. each for electric railroad service; three engines of 1,000 H. P. each for Barcelona, Spain; two engines of 1,000 H. P. for Madrid, Spain, both for electric roads; four engines of 1,500 H. P. for the Sidney, New South Wales, tramways.

The new boiler plant of the Altoona Iron Company, Altoona, Pa., is now about completed. The boiler house is 46 x 45 ft., with slate roof, contains three return tubular boilers of 125 H. P. each, capable of being operated singly, in pairs or entire as needed, supplied with iron draft-stack 54 in. in diameter and 100 ft. high. This plant was built by the A. B. Farquhar Company, of York, Pa. The boilers will supply steam power for the entire works, and will displace the old boilers, consisting of two batteries containing six boilers of 45 H. P.

each. The ground now occupied by them will be utilized in handling and preparing material to be rolled into bar iron.

The American Tin Plate Company, of Elwood, Ind., has adopted the following scale, to be operative until June 30th, 1898: Under the Huzzey patent, tin men, 4 1/2 c. and risers 2 3/4 c. per box; under the Banfield patent, for large plates tin men shall receive 4 1/2 c. and risers 3 c.; for small, tin men 4 1/2 c. and risers 3 1/2 c. per box; forterne and lead stacks, tin men shall receive 4 1/2 c. and risers 2 c. per box; for single stacks for large plates tin men shall receive 5 1/2 c. and risers 3 1/2 c.; for small plates tin men shall receive 6 1/2 c. and risers 4 1/2 c. For first-class charcoal stack tin men shall receive \$2 and risers \$1.50 per day. The wheelers shall receive \$1.75 per day, providing that 11 stacks constitute a day's work. Truckers, carriers, dusters, reckoners, shall receive 13 1/2 c. per hour, or \$1.35 per day.

TRADE CATALOGUES.

The latest "Catalogue of Mining Machinery and Supplies" issued by the Edward P. Allis Company, of Milwaukee, Wisconsin, is a substantial volume of 300 pages, containing many additions to the company's former lists. The wide range covered by the company is shown by the division of the catalogue into five parts. Section I. covers 56 pages, and includes engines, hoists, pumps, boilers, belting and fixtures. Section II., 65 pages, gives crushing, sizing and concentrating machinery. Section III., 49 pages, has stamp, chlorination and cyanide mills. Section IV., 35 pages, includes furnaces, machinery and appliances for smelting and refining works. Section V., 48 pages, treats of Leyner drills, air compressors and receivers. The catalogue is an attractive one, clear type, excellent engravings and good paper being found throughout. There is hardly any requisite for a mining plant which is not referred to in its pages.

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 one of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

WEEK ENDING SEPTEMBER 28TH, 1897.

- 590,587. HOISTING ENGINE. Almon E. Norris, Cambridge, Mass., Assignor to the Rawson & Morrison Manufacturing Company, same place. Combination of a shaft, a friction member fast thereon, a check-plate loose thereon, a spring concentric with the shaft, and confined between the fast member and the check-plate, bolts connecting the fast member and the check-plate to limit the recoil of the spring, whereby the shaft, fast member, check-plate and spring rotate together, and a loose friction member adapted to be shifted into engagement with the fast friction member and to be disengaged therefrom by the spring.
- 590,640. CARBURER. Daniel J. Byrne, Washington, D. C. This consists of a cover with tapering neck, a four-way tube, fitting in the neck, bushings in four-way tube, air tube and pipes jointed by three-way tubes to the tank.
- 590,673. PROCESS OF AND APPARATUS FOR ELECTRICALLY TREATING ORES. Francis H. Soden, Chicago, Ill. The method consists in subjecting the ore under confinement against the access of atmospheric air to the action of superheated air, and subjecting it to the action of purifying gas, such as hydrogen, and during the periods of such subjecting, heating the ore by subjecting it conductively to the action of an electric current.
- 590,674. APPARATUS FOR GENERATING ACETYLENE GAS. Axel A. Strom, Austin, Ill. Assignor to Walmsley & Company, Chicago, Ill. Combination with a gas-holder and a generator intercommunicating through a water pipe connection, of a float valve device in the holder having a body provided with a tubular passage coupled to the water pipe connection.
- 590,675. ORE CONCENTRATOR. Arthur R. Wilfley, Denver, Colo. A transversely inclined concentrating table having a movement whose tendency is to carry the material longitudinally forward toward the tail or foot of the table, the table being provided with a number of riffles extending longitudinally a portion of the distance from its head toward its foot, the riffles varying in length for the purpose specified, the table having a smooth, plain or unriffled portion extending from the extremities of the riffles toward the table, whereby the material as it leaves the riffles is subjected to the action of the final separation of the mineral from the gangue effected.
- 590,739. PROCESS OF SEPARATING ORES. Bruce F. House, Denver, Colo. The process consists in admitting ammoniated air below the surface of water or pulp for the purpose of precipitating the ore held therein.
- 590,748. CRUSHER. Milton F. Williams and Edward H. Frickey, St. Louis, Mo., Assignors, by direct and mesne assignments, to the Williams Patent Crusher and Pulverizer Company, same place. This crusher comprises a casing having a hopper-opening, a rotary shaft, and hammer supports thereon, hammers pivotally mounted in the supports, an adjustable dead-plate inclined downward toward the hammers in their acting position to draw the material in, and with its inner edge directly adjacent to the path of the hammers, and a concave cage co-acting with the dead-plate to crush the material.
- 590,801. PROCESS OF TREATING REBELLIOUS ORES. Wilfred L. Brown, San Francisco, Cal. The process consists in adding a suitable compound to the ores and water, which compound contains an element which has a chemical affinity for the base constituents of the ore, then passing an electric current through the material to unite the element chemically with the base constituents and to liberate the precious metals,

then circulating the material over an amalgamated surface which is not in the electrical circuit and finally returning the material again through the field of electrolytic action.

- 590,878. 590,809. MAGNETIC ORE SEPARATOR. Lewis G. Rowand, Camden, N. J. Combination of an electric machine, a conveyer belt traveling within and beyond the magnetic field of the electric machine, a receptacle beneath the conveyer within vertical lines through the horizontal limits of the magnetic field, and a receptacle beneath the conveyer beyond the magnetic field of the electric machine.
- 590,834. REGENERATIVE GAS FURNACE. Frederic Siemens, Dresden, Germany. Combination with the furnace chamber having a tap hole in its front wall and a door in its rear wall in line with the tap hole, of two connected gas producers respectively arranged behind and opening into the opposite ends of the furnace chamber and having a free space between them to afford access to the door.
- 590,887. HYDRAULIC OR PNEUMATIC TUNNELING SHIELD. Cornelius G. Hastings, Chicago, Ill. This tunneling shield has an inwardly and rearwardly extended annular flange at its front end, cutters on the flange, and a number of partitions in the rear portion of the shield forming walls of communicating chambers.
- 590,893. METHOD OF AND APPARATUS FOR MANUFACTURING GAS. John H. Ladd, London, England. The method consists in carbureting hot air with a hot hydrocarbon vapor and charging the carbureted air with vapor of water below the steam generating point.
- 590,925. CONTINUOUS PROCESS OF REDUCING IRON SPONGE. Gustaf M. Westman, Hackettstown, N. J. The process consists in taking gases from the top of the reducing furnaces, heating the gases by passing them through a previously heated regenerator, then passing the reheated gases down through a body of incandescent coke; next, newly forming another independent body of gases, by independently admitting atmospheric air into and through incandescent coke; and mingling the two bodies of gases thus produced in the presence of incandescent coke, and conducting the mixture into the reducing furnace directly to return the degree of heat necessary to the reduction of the ore.
- 590,926. EXCAVATING MACHINE. Milton A. Wheaton, San Francisco, Cal. Combination with a movable main frame of excavating-buckets arranged to cut transverse of the machine outward starting substantially from its center and to convey and deposit the excavated material alongside of the excavation so as to form an embankment thereof, and of mechanism for imparting longitudinal movement to the machine and imparting transverse movement to the excavating-buckets during the longitudinal movement of the machine.

MACHINERY AND SUPPLIES WANTED.

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

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

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.

ALABAMA.

JEFFERSON COUNTY.

Advances in wages ranging from 10 to 20% were recently granted the coal miners in the Birmingham District by four mining companies, employing together about 2,000 men. The Standard Coal Company, at Brookside, and the Dora Mining Company, at Horse Creek, raised wages 2 1/2 c. per ton, Elliott & Carrington granted a 5c. advance at the Little Warrior mines, while the McDonald Coal Mining Company, at Carbon Hill, gave an advance of 10c. per ton. These companies are not among those who operate under the sliding wage scale based on the price of iron as do the largest mine operators in this section, and the advance in each instance was voluntary. It is expected that the Tennessee Coal, Iron and Railroad Company and the Sloss Iron and Steel Company, employing 10,000 miners, will soon increase wages about 8%, in accordance with their contracts. Work is so plentiful at the mines that various operators are advertising for more help.

ALASKA.

KLONDIKE-YUKON.

(From Our Special Correspondent.)

SKAGUAY, ALASKA, Sept. 23. The new town of Skaguay, which was staked off in August, has now 400 buildings and four wharves in course of construction. The population numbers 1,000 to 1,200. It is five miles from Dyea and has a land-locked harbor.

There is no government post-office here, but a volunteer looks after the mail matter, charging 5c. for each letter sent out and the same for those received.

On September 19th, on the Dyea trail, near the stone house at the foot of the summit, between 6 and 7 o'clock in the morning, a great glacier broke loose, and through its walls a body of water 20 ft. high and 300 ft. wide came down the canyons. There were 25 people camped at the stone house with their whole outfit, and some of them were asleep when the warning came.

It was first reported that a half-dozen or more were drowned, but so far only one life was lost that we have heard of. An eye-witness says that the old stone house has been scattered down the valley for a mile and great boulders 30 ft. round were rolled

down the canyon. The Dyea trail has not been damaged much; only a few corduroy bridges have been washed out.

The Skaguay trail is terrible for man and beast. It is almost impassable now and traffic has about ceased. It is lined with dead animals from one end to the other. Out of 2,000 horses, mules and oxen that were packing three weeks ago only 300 are left. The other 1,700 have died from starvation or been killed through accident.

On the Dyea trail 100 more have died. Five or six hundred men will be stranded on the Skaguay trail who will have to build cabins and wait till spring. A number of them have unfortunately been caught in places where it will be difficult to obtain a supply of fuel.

Fully 25% of the 5,000 who crossed the summit this fall for the Yukon have not taken enough food to last them till March next, and few have over a year's supply. Every man who has come from Dawson this summer says there is going to be a shortage of provisions, owing partly to the fact that the North American Trading Company and the Alaska Commercial Company have put on their boats on the Yukon so much liquor and other goods, that now there is much danger of scarcity and suffering at Dawson and all points in the interior. It has not frozen up here yet. The mud is deep, owing to the fact that it has been raining for a week.

SHEEP CREEK.

LITTLE QUEEN.—William McLernon has a small force at work developing this claim, and has found galena and copper ore which promise well.

LUCERNE GROUP.—An examination of these claims is now being made, with a view to their purchase by parties from California.

SILVER BOW BASIN.

NOWELL GOLD MINING COMPANY.—This company, says the *Alaska Mining Record*, keeps two giants constantly turning over the gravel in its Silver Bow Basin placers. The bank increases to 100 ft. in thickness as Ice Gulch is approached. In former years the old miners worked some very rich ground in that gulch, but the depth of gravel was too great for them to reach the bedrock by their methods of shoveling in and with no outlet for tailings.

ARIZONA.

COCHISE COUNTY.

EXCELSIOR.—This property has been bonded by Los Angeles capitalists for \$10,000. The owners are John Burke and J. J. Poe.

KLONDIKE.—Los Angeles capitalists have bonded this property from the owners, John Poe and Robert Downey, for \$10,000.

MIRACLE.—J. Sheehy and P. McCarthy have bonded this property to Los Angeles people for \$10,000.

MOUNTAIN DEW.—This mine is owned by John Burke and L. Seranton, and has recently been bonded to Los Angeles, Cal., capitalists for \$10,000.

GILA COUNTY.

BLACK WARRIOR COPPER COMPANY.—The hoisting works of this mine, near Globe, were blown up with dynamite October 2d. The shaft house and engine were completely wrecked.

YAVAPAI COUNTY.

The case of Jordan vs. Shuerman, which was recently tried by the grand jury in Prescott, has been decided in the defendant's favor. The suit was over the title of 366 acres of mining ground near the property of the United Verde Copper Company. A report states that W. A. Clark and Marcus Daly are interested in this litigation.

GUIJAS GOLD MINING COMPANY.—This company was recently incorporated at Tucson by Thos. F. Delaney, Wm. P. Delaney, Noah Bowlus, David R. Austin and Frank A. Smith. There are a few other stockholders. The capital stock is \$1,500,000. The company will work six claims, about 60 miles from Tucson, which cover a tract of about 140 acres. These claims are located on a slope of the Guijas mountains, and \$20,000 worth of work has already been done on them.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

AMERICAN.—The last mill run at this mine, six miles east of Sutter Creek, yielded \$2,000 in bullion. The work of sinking is going forward rapidly and 20 men are employed. Willfred Dennis is superintendent.

KEYSTONE.—At this mine, in Amador City, a large force of men are employed and the 40-stamp mill is kept running steadily with satisfactory results.

BUTTE COUNTY.

(From Our Special Correspondent.)

MAGALIA.—In this drift mine, three miles northeast of Magalia, near Butte Creek, a large body of rich cement has been uncovered, and as it cannot be dissolved by water, the owners are erecting a 10 stamp mill to crush it. This mine has a most complete plant operated by two 60-H. P. boilers and Pelton water wheels.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

LAMPHYRE.—At this mine, one mile south of Mokelumne Hill, rich ore has been encountered on the 300-ft. level. It was found by running a cross-cut 35 ft. The average width is said to be 10 ft.,

and it prospects \$10 per ton the entire width. There is a hoist on the property capable of sinking 1,000 ft. Water is obtained from the Mokelumne & Campo Canal. W. T. Harris is superintendent.

ELDORADO COUNTY.

(From Our Special Correspondent.)

HINES.—This mine, near Spanish Dry Diggings, 7 miles west of Georgetown, and now under bond to an English syndicate, is producing largely. The property was formerly owned by Simpser, Rouse, Hines, Gilbert & Rooke.

HUMBOLDT COUNTY.

(From Our Special Correspondent.)

A company, with a capital of \$10,000, has been organized by P. E. Parker, H. Brace, N. D. Hulse, E. Olmstead and G. W. Brace to work black sand at the mouth of the Little River, 20 miles from Eureka. The plant is to cost \$4,000, and is now being erected. The 88 acres leased will, it is said, keep the company busy for the next 10 years, should it be successful.

KERN COUNTY.

(From Our Special Correspondent.)

Montgomery, Hicks & Griffith, of Los Angeles, are building a 10-stamp mill at Johannesburg. It will be especially designed for custom work.

PLACER COUNTY.

(From Our Special Correspondent.)

EUREKA.—This drift mine, three miles north of Sunny South, comprises 3,600 acres and six miles on the Dick Channel. The tunnel, 7 by 7 ft., which has been driven at the rate of 170 ft. per month with machine drills, has at last struck the channel 200 ft. below bedrock, thus making it convenient and cheap to work by means of upraises. Felix Chappelle is superintendent.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

F. V. Johnson, of San Diego, is developing several quartz claims about 35 miles southeast of San Diego, in the Onaida District, near Dulzpra. Fine gold has been found unevenly distributed throughout the dike and according to some authorities gold was found by the Spaniards coming up the coast in the last century.

SANTA BARBARA COUNTY.

(From Our Special Correspondent.)

ALCATRAZ ASPHALT COMPANY.—This company contemplates expending a large sum of money in the Sisquoc and Gaviota districts for pipe lines, tanks, wharfs, reservoir and other works. Three hundred tons of pipe are now at Gaviota and 180 tons at Wigmore station.

SHASTA COUNTY.

(From Our Special Correspondent.)

BRUNSWICK.—This property, comprising five claims, located five miles west of French Gulch, now under bond to M. D. Howell, of San Francisco, is being developed on a large scale.

GOLD HILL EXTENSION.—This mine, at Harrison's Gulch, has been sold to Captain Roberts, who will commence development work at once.

SIERRA COUNTY.

(From Our Special Correspondent.)

GARNET CONSOLIDATED COMPANY.—At last the gravel in this mine has been struck in what is known as the Bunker Hill mine. It is said the gravel will run \$10. This mine adjoins the North America, which belongs to the same company, the latter being just over the line in Plumas County.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

QUINN & MCCONNELL.—This river claim on a bar in the Klamath River, below the mouth of the Humbung Creek, is showing good pay, considerable gold being taken out by 25 men employed.

TRINITY COUNTY.

(From Our Special Correspondent.)

The Paulsen-Hughes, Union Hill, and Dutton Hill mines, located along Trinity River between Lowden Ranch and Douglass City, are reported sold to Dr. O. H. Simonds, of Redding, who held the bond. This group comprises 1,500 acres which contains the largest deposits of gravel in the county. Included in this deal is the Grass Valley Creek water right, which furnishes 5,000 inches of water during the winter and summer months. The Paulsen-Hughes mine, which comprises 575 acres, has been prospected by cuts, shafts and tunnels, which show a gravel deposit, supposed to be an ancient river channel, that carries fine and coarse gold. The average estimate is 15 cents per cubic yard. The Union Hill and Dutton Creek mines contain large bodies of gravel, but have not been worked very much on account of the insufficient supply of water; now the Grass Valley Creek will cover the demand. The gravel in these claims where prospected shows richer than that in the Paulsen-Hughes claims.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

CROESUS.—This mine, near Dead Horse, is being opened by Connally & Winwood. With a 6 in. pump the mine can be kept free from water and profitably worked.

LA ESTRELLA MINING AND MILLING COMPANY.—This company, working the extension of the Golden Gate mine under bond, has crosscut a vein carrying 8% sulphurets which return \$29 per ton from the smelter. The tunnel is in 165 ft. and is

being driven to cut a large vein which shows free gold on the surface.

ONE HOSS.—This mine, in the Big Creek district near Groveland, is producing ore which mills \$13 per ton. The ledge is 2 ft. in width. The working force is to be increased and development work pushed rapidly.

COLORADO.

CUSTER COUNTY.

BASSICK MINING COMPANY.—E. C. Bassick, through his attorney, Hugh Butler, has filed in the District Court an answer to the last Bassick mine suit in which Alexander Barclay and Philip Allen are plaintiffs, and he is made defendant with Staples, Ryan, Spooner and the Bassick Mining Company. On his own behalf Bassick answers the charges with explicit denial and sets up eight distinct forms of defense. According to this narrative in June, 1895, the Bassick mine fell behind in its obligations to creditors, including the men working on the mine, and the property was attached under the miner's lien law for the debt. This lien held good, the mining company not meeting the demands of the workmen, and the sheriff sold the property to liquidate the debts under the miner's lien. Clapp Spooner bought the property for \$37,599 85, and satisfied all claims which had then been filed. Subsequently other claims were filed against the property and after considerable legal entanglements were untwisted, James Staples bought in the mine at a sheriff's sale in June, 1897, and received title to the entire property of the Bassick mine. Frank S. Brown and Dennis Ryan were at that time the head officers of the Bassick Mining Company, and when Staples was awarded a court title to the property, they hired some men and took forcible possession of the mine against Staples, claiming that they were acting for the Bassick Mining Company. They were really acting for themselves, the answer alleges, and had no authority from the Bassick Mining Company to do anything in the matter. In fact the stockholders had now become so disgusted with the whole management that they would do nothing more and for years the company has had no existence and could not legally take any further part in the transactions. Ryan and Brown, it is stated, forced Staples to agree to a compromise. Staples entered into an agreement, so runs the narrative, whereby he was to take a one-half interest in the property as his share and Brown and Ryan would unite with him and fight no more. But Brown died in 1892 and after his death Ryan repudiated the agreement. Ryan formed the new Bassick Mining Company and undertook to reopen the mine. He spent between \$30,000 and \$50,000 in an effort to unwater the mine and then closed down again. Staples, meanwhile, went into the courts to obtain a writ of ejectment against Ryan. After the case had run its course through the courts it was finally held that the title to the mine rested in Staples through his titled purchase at the sheriff's sale. Ryan fought this decision up to the Supreme Court of the United States, and the case was eventually ended by a decision handed down March 8th, 1897, whereby Ryan was declared absolutely without a case and Staples held the now undisputed title. Ryan was not done yet. Other stockholders in the old company filed a suit for recovery and the case now in the District Court is the result. All these allegations are made by Mr. Bassick, who has come into possession of the Staples rights, in a voluminous answer filed recently. The allegation is also made that the Bassick Company having ceased to have a legal existence long ago, no stockholder can now come into court.

EL PASO COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

BRODIE REDUCTION COMPANY.—This company has let contracts for enlarging the mill at Mound City. The additions, which will be completed as soon as possible, consist of a building on the west side of the present mill, 65 ft. in length by 80 ft. in width. Within will be placed four leaching tanks, each 30 ft. in diameter and 5 ft. deep, with a capacity of 140 tons each, also two solution tanks, 15 ft. in diameter and 6 ft. deep, with a capacity of 35 tons of solution each, and two Wilfley concentrating tables. When these are in place the mill will have 13 leaching tanks with a capacity of 1,000 tons of ore, nine solution tanks with a capacity for 315 tons solution and five Wilfley concentrating tables.

DOCTOR.—A great deal of work in the way of development is being done on this mine, on Raven Hill. The mine is producing steadily. A station is now being cut at the 610 ft. level from which drifts will be run and the shaft sunk still deeper. Shipments are being made daily, part going to the smelters and the rest to the mills.

LONACONING.—C. G. Jackson and others who are leasing a block of ground on the Lonaconing claim, a part of the Kimberly Company's property on the west slope of Beacon Hill, have struck a vein of good ore in a crosscut run from the bottom of their shaft which is 140 ft. deep. The vein is fully 18 in. in width and will assay from \$280 up to \$640 per ton. This is thought to be an extension of the Fannie & Orizaba vein which has produced so much rich ore.

MARY MCKINNEY.—There are now 24 men employed on the Buch lease on the Mary McKinney, on Guyot Hill, crosscutting and drifting from the 120-ft. level. The ore chute has been drifted on for 90 ft. and still shows good ore in the breast.

GILPIN COUNTY.

QUEEN OF THE WEST.—This mine is located in Chase Gulch. The body of smelting ore on the property ranges from 6 to 18 in. in width, and is continuous in the lower levels, and for 150 ft. of the shaft to the present depth, the bottom of the shaft showing 3 ft. of high grade milling ore and 12 in. of smelting ore. An 80-H. P. engine and boiler will be placed in the property at once and active operations begun. It is stated that the Queen of the West has been sold to H. J. Stephens, of Denver, Colo., for \$20,000 spot cash.

HINSDALE COUNTY.

(From Our Special Correspondent.)

HIDDEN TREASURE.—A large amount of surface improvement has lately been done in erecting necessary buildings at the mine. A new mill is also being put in and will be of sufficient capacity to more than handle the mine's output.

ELEN.—Sweet & Company, the owners, report a fine body of ore exposed in the breast, and will put in a force of men at once.

SILVER STAR.—This is at present the only property being worked at Camp Carson. A good streak of high-grade ore is being washed and shipments are profitable.

LAKE COUNTY.

BREECE MINING COMPANY.—President Whitefield, of this company, has issued a circular to stockholders saying that gold bearing ore has been found on the property and that it is desirable for the stockholders to act upon the matter of a lease to Messrs. Sullivan, who are lessees already of two of the Breece claims. Mr. Willis A. Barnes has examined the property and makes a report to the general effect that the lessees are financially strong, experienced and skillful. Indications are that there is a large body of ore running through the property, but it lies deep and quite large expenditure will be necessary to reach it. The lessees propose a royalty on ore which they may find on a sliding scale ranging from 5% for low-grade ore up to 40% for high-grade ore. They are willing to pay a royalty of 75c. a ton on iron ore. Mr. Barnes recommends the proposed lease.

(From Our Special Correspondent.)

Without waiting for a conference with the mine managers the Rio Grande Railroad announced a reduction on freight rates for ore from this camp, and as a result the other two roads followed. I learn from the mine managers that the reduction on the higher grade ores is \$1.45 per ton and on the lower grade iron \$1 per ton. This certainly means an increased production on the lower grade metals of the camp.

ORE PRODUCTION.—The statement compiled by your correspondent last week showing conclusively that the production of the camp was at least 2,000 tons per day at the present time, including all classes of ore shipped, was received with surprise by the mining men, but is set down by them as a conservative estimate after carefully going over the figures. As stated before fully 1,000 tons of this product is low-grade iron ore.

PUMPING PROPOSITION.—Up to this time no move has been made toward starting the downtown pumps, although the reduction to be asked from the railroads has been granted. I learn from Mr. Eben Smith, of the Moffat-Smith combination, that the probabilities are that the pumps will start in the near future, although the present low price of silver is very unfavorable to such a proposition. The other members of the association are of the opinion that nothing now stands in the way of a resumption.

BANKER MINING COMPANY.—These people, who are after the Jonny ore shoot, were compelled to do a little more preparatory work this week before they could push sinking from their 350-ft. level. Manager Guth found that the water came seeping in at the 210-ft. level and dropped down to the lower workings raising some 15 to 20 ft. This is being hoisted and a basin is being built of clay at the 210-ft. level, to hold the water there, from which it can be raised to the surface. No water is coming in from the lower workings, showing conclusively that this water is merely a seepage from the property surrounding and above these workings.

BREECE HILL.—In a recent letter I called attention at length to the Breece Hill section. A great deal of the territory has not yet been developed, but there are new propositions being opened up at the present time and new work is being planned by other gold producers. The Little Jonny mines are at the present time producing 300 tons of fine ore a day and are opening up much new ground for further development work.

HILL TOP.—These people are shipping from their property and are also doing extensive work on new ground which they have leased, and which includes the Equator property, where they have opened up a good ore shoot. Shipments at the present time, it is said, are over 100 tons a day of a very good grade of mineral.

PAWNOLAS.—In this property, in Big Evans, a great deal of prospecting work is being carried on in the hope of catching a good ore body. It will be remembered that a few years ago a rich streak of ore was opened up in this ground that assayed 1,000 oz. silver, but it was only a streak and despite an endeavor to locate the original ore body it was not found.

PENNSYLVANIA.—These people on Breece Hill are

opening up a good body of ore in their workings very near the surface, and at a depth of only 40 ft. they have an ore body running well in gold from which they have already shipped about 600 tons of ore. Operations are to be pushed extensively from now on.

SEDALIA.—Mr. Yankee is doing much development work on this property, which is showing a big increase in the size of the ore body. From eight to ten carloads a day of high-grade gold ore are being shipped. Most of the work is being carried on in the lower levels where the ore shoot is opening up extensively.

PITKIN COUNTY.

OPHIR & QUEEN CONSOLIDATED MINING AND MILLING COMPANY.—All conflict between the Red Stone and Sipca placer claims and this company, whose property is located in Queen's Gulch, has been settled, as attested by a deed and contract filed with the County Clerk and Recorder at Aspen recently. The deed conveys to the company from V. Magary, L. R. Tucker and O. Hanson all their interest in a certain wagon road now being constructed in the gulch, a 200-ft. strip of land on the north side of the Red Stone placer, a 250-ft. strip of land on the west side of the Sipca claim, and releases all territory in conflict between the Ground Hog and Victor placer and the Red Stone placer. According to the agreement the Ophir company will construct and maintain the wagon road, which will be used jointly by all parties to the contract.

MONTEZUMA COUNTY.

(From Our Special Correspondent.)

BEN HILL.—Patterson & Company are rapidly pushing work on their new tunnel, which is destined to cut the vein at a depth of 100 ft. The boarding-house is completed and ready to accommodate employees. The tunnel is in 25 ft. and working three shifts of eight hours each.

GRASSY HILL TUNNEL.—Excavating for the buildings has been completed. The tunnel mouth is also faced, and the work of driving it will begin as soon as necessary mining timbers arrive.

LITTLE JAKE.—J. E. Medaris is working this property and recently struck a good-sized body of ore, carrying fair values in gold. Arrangements are being made to work all winter.

NORTH STAR.—Twelve men make up the force of miners, and more ore is being mined than can be treated at the mill. Concentrators are to be added to the mill at once.

SMALL HOPES.—Two carloads of ore were recently shipped to the Omaha & Grant smelter, in Denver, with such encouraging returns that arrangements are being made to continue operations on an extensive basis.

TENDERFOOT MILL.—Recent tests on tailings from this mill give such returns that concentrators have been ordered and will be in place by November 1st.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

CALAVERITE COMPANY.—Superintendent Stearne reports the properties of this company, in Bear Creek, to be in excellent condition and producing large quantities of first-class ore.

ENTERPRISE.—This property two months ago was an abandoned prospect, but is now shipping a carload per week of carbonates, running 15 oz. silver and 66% lead. A cave has also been opened up, 100 ft. in length, which is almost filled with fine lead carbonates, but this is held in reserve until the silver market advances.

FISHER MILL.—This mill, also at Gladstone, is to be enlarged at once to a 30-ton concentrating plant, Mr. Grabowsky, the owner, having interested outside capital for that purpose.

IOWA.—A body of ore has been blocked out for milling purposes which is 300 ft. long, 200 ft. in height and from 2 to 9 ft. in thickness. Some 5,000 tons have already been broken and await transportation to the mill. The tram is being worked to its full capacity, conveying 175 tons per day, but is scarcely able to keep up with the production.

LARK.—Supplies and material have been sent up, and a car and track will be at once put in the 200 ft. crosscut, which is to be driven 150 ft. further. The owners will also put in a force of men to break ore in the tunnel above, and expect to begin shipments by October 5th.

LUCY MINING AND MILLING COMPANY.—This company has advertised for bids for driving 250 ft. on their property in Ice Lake basin. Reynolds & Black have just completed their contract on the Grand View, and disclosed a good-sized streak of rich gold ore. The Last Hope, on the north side of the basin, is also owned by the Lucy Company, and has a fine body of ore in sight. The shaft is 7 ft. wide and averages \$30 per ton in gold and silver, the former predominating.

RED & BONITA MOUNTAIN COMPANY.—This company will at once begin the erection at Gladstone of a 50-ton mill for treatment of the bodies of low-grade ores at its properties. Mr. M. P. Whipple will have charge of the mill.

RIDGWAY.—An order for 20,000 ft. of lumber has been placed to build new ore-houses at this property. A new brick house is also to be erected at once. Shipments are now two cars per week, but will be increased to four cars with the completion of the ore house. At the intersection of the Ridgway and Alaska veins a body of good milling ore

has been encountered. The ore in the lower level runs 2 oz. gold in carload lots. A new level is to be started in October, which will cut the vein 200 ft. lower. Mr. Chas. Koennecker has charge of the property.

SAMPSON MILL.—This old plant is to be overhauled and enlarged for custom work, making three plants of this kind in the Gladstone District.

SOUTH MINERAL.—This has lately proved to be an extension of the Aspen, and has a 2-ft. vein of fine milling ore. About six carloads of good shipping ore now await shipment.

SUNNYSIDE.—A new tramway is being erected to connect the mine and mill, but work has been retarded by bad weather. Efforts will be made to have the tram in operation by October 10th. The mill is running on half-time, and will be increased to 50 tons capacity with the completion of the tram. Several new buildings are also being erected and the force is to be largely increased.

TIGER.—Twenty men comprise the force, and 8 tons of good lead-silver ore is the output. A tunnel is being driven which will cut the vein 200 ft. below the present lowest level. Additional buildings are soon to be erected and the force increased.

GEORGIA.

SOUTHERN MINING COMPANY.—Messrs. T. D. Meador, Burton Smith, Franklin Weld, R. T. Dorsey and Clifford L. Anderson have filed in the superior court an application for a charter for this company. It is to be the successor of the Georgia Mining, Manufacturing and Investment Company, the affairs of which have been in process of settlement in the Fulton superior court for several years. The new company will own the leases held by the Georgia Mining Company to the coal and iron properties in the northern part of the State, and will own four-fifths of the stock in the companies to which the mines and equipment belong. As soon as the charter is obtained the needed repairs will be made and operations resumed at the mines and several miles of additional railway track will be laid. At present the Dade coal mines are the only ones in operation. The capital stock of the new company will be \$500,000, divided into shares of the par value of \$100 each. The privilege is requested of increasing this amount to \$1,000,000 or decreasing it to \$100,000 by a vote of a majority of the members.

IDAHO.

OWYHEE COUNTY.

ALPINE.—Messrs. Jarvis and Davis have leased W. N. Nichols' interest in this property, and are now at work taking out free milling ore.

SOUTH CENTRAL.—A crew of carpenters are busily at work installing the new electro-cyanide plant in the Poorman mill.

SHOSHONE COUNTY.

COLWYN.—Ten men are at work on this property on Sunset Peak. The lower tunnel is in about 155 ft. About 150 ft. further will have to be run to get under the ore body exposed in the upper workings. A winze is being sunk.

DORA & KATIE BURNET CONSOLIDATED MINING COMPANY.—This company is putting a Wildey vanner into the Idaho mill.

ILLINOIS.

The soft coal miners' strike is practically at an end, and the Springfield scale of wages is already being paid by many of the large companies. A few of the smaller concerns, however, are still holding off.

The scale, which was recently adopted at a joint meeting of operators and miners of the Springfield sub-districts, is 37½¢ per ton, gross weight, for all coal mined. The most important coal mining districts have also adopted this scale, and the leading companies have agreed to accede to it with the usual local modifications. Some of the smaller operators will only pay the new scale conditionally. Work has generally been resumed and the greater part of the collieries are running.

HARDIN COUNTY.

FLUOR SPAR COMPANY.—This company has developed another spar property, from which a clear white fluorspar is being taken. The supply seems to be practically unlimited.

NICHOLAS COUNTY.

The Boyd M. Smith pyrites mine near Ellisville has recently been put in operation.

WEBSTER COUNTY.

PROVIDENCE COAL COMPANY.—A new battery of boilers is being added to the equipment of this company's plant at Providence.

MICHIGAN.

BAY COUNTY.

MONITOR.—Work on the new shaft at this coal mine is being pushed and the company expects to have it in use within a few weeks. A powerful hoisting engine of the Bay City Marine Iron Works make was taken to the mine recently and will be placed in use at once.

COPPER.

A new expedition under charge of J. C. Jones, of Cleveland, O., is prospecting for copper in the Porcupine Mountain district in the neighborhood of the old Carp Lake mine. Mr. Jones had charge of that mine when it was in operation.

ATLANTIC MINING COMPANY.—The production in September is reported at 289 tons of copper, which compares with 279 tons in August and 258 tons in September of last year.

FRANKLIN MINING COMPANY.—The latest report from the mine says that in the 33th level one machine is at work in stoping, and there is considerable copper rock left with some heavy barrel work. There is some good ground in the 36th level, with a few masses which will go from 500 to 800 lbs. There are two good stopes in operation. In the 34th level the stope is looking well, a good deal of mass copper is in sight, with much rich stamp rock. There is one machine cleaning up the foot wall in the 32d level. The work on the north end of the mine is being pushed. In the 9th level the stope is fairly good. In the 11th level the drift is of a very encouraging nature. The 20th level north is now being drifted through better ground than expected. There is some heavy copper and good stamp rock.

The Franklin, Jr., mine will begin shipping rock to mill. Copper struck in No. 2 shaft at depth of 150 ft. The lode is 12 ft. wide and well mineralized throughout.

This company reports an output of 150 tons of copper in September, against 152 tons in the corresponding month last year.

QUINCY MINING COMPANY.—The September output was 850 tons of copper, the same as for August; in September, 1896, the production was 851 tons.

WOLVERINE MINING COMPANY.—The output in September was 107 tons in copper; in August it was 160 tons, while in September of last year it was 105 tons.

IRON—GOGEBIC RANGE.

METROPOLITAN LAND AND IRON COMPANY.—Reports have been current for some time of pending negotiations for the sale of this company's property, and it is now announced that the company's stock has substantially all been transferred to the Carnegie Steel Company. The price paid is not made public, but report puts it at about \$20 per share. Options at that price were taken on 60% of the stock by Mr. H. W. Oliver some months ago. The company owns the Norrie and the Tilden mines, the largest two producers on the Gogebic Range. Both are Bessemer mines, nearly all their production coming below the Bessemer standard in phosphorus. The two mines shipped in 1896 a total of 579,273 tons of ore, but that was not by any means their full capacity; the Norrie has shipped 985,000 tons in one season, and the Tilden has gone over 400,000 tons. It is understood that the Oliver Steel Company in Pittsburg is interested with the Carnegie Company in the purchase.

IRON—MARQUETTE RANGE.

CLEVELAND-CLIFFS IRON COMPANY.—This company has decided to reopen the Cliffs shaft, which was closed four years ago. Men are now at work putting the machinery in order, and the pump will be started up as soon as possible. It will take some time to unwater the mine, so that the underground force can go to work. It is said that a full force—about 400 men—will be employed as soon as possible.

MARQUETTE COUNTY.

ROPES GOLD AND SILVER MINING COMPANY.—In the Circuit Court at Marquette recently an order was issued authorizing the receiver of this company to sell its mine and other property to satisfy claims. The receiver must file an additional bond of \$10,000. The order was issued as the result of a suit brought by the Atlantic Dynamite Company.

MINNESOTA.

(From Our Special Correspondent.)

There has been no advance in freight rates from the upper lakes to the East, and as it is generally believed that the wheat movement has seen its biggest days for the season, there may not be any yet awhile. If not, some of the mines that have closed down may resume and the shipments for the year will be considerably augmented over what now seems probable. Vessels now in the ore trade are season's charters or company ships, and the shipments are consequently falling off materially. From Two Harbors the past week they were 17, with a total of about 65,000 tons, and from Duluth they were little more.

The total Minnesota shipments to October have been, in round numbers, 4,700,000 tons, of which Two Harbors has sent 2,200,000, Duluth 1,970,000, and Superior 540,000. It will be seen that the Minnesota Iron Company has been able to lead in quantity sent forward, as it has fully intended to all the season. It is probable that nearly 1,000,000 tons more will be shipped before the summer season closes. For September Two Harbors shipped 400,000 tons, Duluth 407,000, and Superior 37,000. Two Harbors will close the year as the greatest shipping port.

Indications are that a deposit of iron ore runs westerly on the Mesabi further than has been supposed, and that north of the upper bend of the Mississippi, at least 25 miles west of any openings, there are good mineralized areas. Near Deer River, 30 miles west of the Arcturus, the most westerly of all openings of promise, what appears to be good ore has been found on the farm of John Wade. Analyses and developments will be made.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

LAKE SUPERIOR MINES.—This group of the Con-

solidated Company is shipping about 2,000 tons daily, most of its seven shafts being idle. Over 1,000 men are employed about these mines and others at Hibbing in mining and railroad building, while another 1,000 are at work in the lumber woods. All this makes labor scarce and gives it good wages, better than for some years.

MINNESOTA IRON COMPANY.—This company's Genoa mine, at Sparta, has shipped its stocked ore and is hoisting steadily and grading larger stockpile grounds. The Auburn is shipping about 1,000 tons a day. The extent of the Auburn and its future are not realized by others than the company's officers. It is one of the greatest deposits of the Mesabi apparently and will be a shipper for a long period. Norman is shipping about 400 tons a day and is the chief factor at present in the Virginia group.

OHIO MINING COMPANY.—This mine has shipped its 40,000-ton order and has closed for the season.

OLIVER MINING COMPANY.—The Oliver mine, closed last week, may be reopened soon, and ship considerable ore this fall. The company's Mountain Iron mine is shipping as heavily as at any time this year, sending out 250 cars a day, with one shovel in ore. It will stop work shortly, with a production for the year of about 1,000,000 tons. Rumors current on older ranges that the new Oliver deal for the Tilden, Norrie and perhaps other mines, would result in closing the Mountain Iron or curtailing operations there, are without foundation.

ROUCHELEAU-RAY IRON LAND COMPANY.—This company has sent crews to open its lands in section 26, west of the Auburn, where ore has been known to exist. The affiliated Roucheleau Company is about to open its property at Biwabik, south of the Canton mine.

IRON—VERMILLION RANGE.

(From Our Special Correspondent.)

CHANDLER IRON COMPANY.—Some 1,300 tons a day are going from this mine, and 410,000 tons have been shipped. The season's total will be about 450,000 tons. About 300 men are at work, but the force will be almost doubled later in the season. Last year the mine paid its men within 6% of the wage scale of 1892, and this season its miners have earned within 12 1/2% of the 1892 scale. It is said that inquiry among banks shows that there is on deposit from workmen at Ely, where this mine is the chief support of the population, an average of \$25 per individual, not much for some localities, but large for a mining region at the close of the past four years. An advance in wages at this mine is expected shortly. The ore stocked this winter will be sufficient to permit shipments of 600,000 tons next year.

MINNESOTA IRON COMPANY.—Chiefly by reason of the tremendous shipments of these mines and the cleaning up of stocked ore for the first time in four years, the range will this year surpass any preceding by not far from 300,000 tons. At the Soudan hard ore mines 700 men are now at work, and from 200 to 500 more will be added later in case the Lee shaft is opened. This has been closed several years on account of litigation, and there is talk of opening it, now that the Minnesota has gained control. A lot of mules are being put underground for tramping at these shafts. The 10% advance in wages, made October 1st, was a surprise coming in the fall, and is supposed to indicate that if affairs continue as they promise, another advance will be made before summer.

PIONEER IRON COMPANY.—This year's shipments will reach 230,000 tons, with 220,000 left in stock. New stock pile grounds are under way.

SECTION 26.—A mile and a half east of Ely this property begins to look like a mine, and costly machinery on hand indicates that it is to be pushed for next year and will be a shipper. Work has been going on for three or four years in a small way under the supervision of J. G. Brown, one of the owners, the other being A. M. Miller, of Duluth. A three-compartment shaft has been sunk 400 ft., 200 ft. in the ore, and much development has been made. The first car of clean ore was hoisted last week, and a small stockpile is now being made from the developments. There is a large Chandler pattern pump, air drills and a heavy hoist. The ore is very similar to that of the Pioneer or Chandler, though slightly darker in color and softer. There is abundance of money back of the mine, and it will be a very important factor in time.

SOUTHALL IRON COMPANY.—This company is developing what promises to be an important mine, in Section 41, Town 63, 13, between Tower and Ely. Developments are now going steadily forward, and it will have some little ore to ship next year.

ZENITH IRON COMPANY.—Some 200 tons are shipped daily and the season will close with a total of over 45,000 tons. More work will be done this winter.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The weather was good for mining operations during the past week. The demand for zinc ore increased on a few choice lots 50c. per ton, and lead ore went up \$1.50 per 1,000 lbs. The shipments of lead ore showed an increase of 15 carloads; but the zinc ore shipments were 22 carloads less than the preceding week. Compared with the corresponding week of 1896, the sales showed an increase of 25 carloads of zinc and 23

carloads of lead ore. Three cars of Joplin zinc ore sold at \$23 per ton, an advance of 50 cts. over the preceding week. Ten cars of Joplin ore, four cars of Oronogo, the Stott City and Springfield products, sold at \$22.50 per ton. The balance of ore sold from \$22 to \$18 per ton according to quality. Lead ore sold at \$30.50 per 1,000 lbs. delivered, an advance of \$1.50. The Geisinger ore, 600,000 lbs., sold at \$31 delivered. The same week of last year the top price paid for zinc ore was \$20.50 per ton, and for lead ore was \$14.50 per 1,000 lbs. All the surplus ore, both zinc and lead, was shipped last week.

Following are the sales of lead and zinc ore from the different camps for the week ending October 2d, 1897:

Joplin zinc, 1,225,400 lbs.; lead, 379,010 lbs.; value, \$25,039. Cartersville zinc, 1,135,440 lbs.; lead, 239,240 lbs.; value, \$19,261. Webb City zinc, 709,200 lbs.; lead, 75,890 lbs.; value, \$9,406. Galena zinc, 3,190,000 lbs.; lead, 1,300,000 lbs.; value, \$51,710. Aurora zinc, 720,000 lbs.; lead, 25,000 lbs.; value, \$6,580. Stott City zinc, 219,080 lbs.; value, \$2,520. Oronogo zinc, 180,180 lbs.; lead, 4,840 lbs.; value, \$2,087. Springfield zinc, 44,000 lbs.; value, \$506. Alba zinc, 14,800 lbs.; value, \$181. Belleville zinc, 6,690 lbs.; lead, 29,380 lbs.; value, \$968. District totals for last week: Zinc, 7,454,820 lbs.; lead, 1,973,310 lbs.; value, \$121,238. District totals, zinc, 40 weeks, 269,345,060 lbs.; lead, 44,283,000 lbs.; value, \$3,290,689.

DOUGHERTY, MILLER & COMPANY.—At their mine on the Mohaska lease they are putting in a pump and steam hoist. They have developed a large face of ore in open ground at 70 ft. and will make a good output of ore.

GRAHAM & HINSON.—On the Rex land they had bad luck last week in breaking the governor belt on the engine of their plant and the machinery was damaged so that it will take a week to repair it. At the time of the accident they were making about a ton of zinc ore every hour.

GRAND MASTER MINING COMPANY.—On the Becky Sharp lease this company has been sinking a new shaft to strike the head of the drift at 140 ft., where there is a good body of pebble zinc ore in open ground. At 107 ft. the shaft struck lead ore and has developed an 11-ft. face of this ore. The company will sink to the zinc ore at 140 ft., then come up and drift on the lead. They clean up on hand jigs and have an 9 in. pump.

GREAT WESTERN COMPANY.—This company has opened up a good lead prospect at 70 ft. in red clay ground and last week turned in 22,000 lbs. lead ore. The company has put in a pump, a steam hoist and two hand jigs.

GROUNDS & IRWIN LEASE.—On this lease, near Jackson Station, west of Joplin, they are drifting at 92 ft. on a 6-ft. face of ore in open ground. There are now four shafts that are taking out pay dirt.

LAURA COMPANY.—On the Renfron lease this company has built a large concentrating plant, and is drifting at 160 ft. in a large face of zinc ore in soft ground and strong water. The product is 20 tons weekly.

PETTIS COUNTY.

Deposits of lead ore, it is reported, have recently been discovered near Sedalia. G. Dutcher, who purchased 120 acres of land west of the Fair Grounds several months ago, and has done considerable prospecting, has made a discovery of lead ore at a depth of 13 ft., it is said.

MONTANA.

GRANITE COUNTY.

GOLDEN SCEPTRE.—The present receiver of this property at Quigley has been discharged, as all creditors have come to an understanding, and the property will be sold in a short time. Mr. McDonald is negotiating for the same for Eastern parties.

HOPE MINING COMPANY OF ST. LOUIS.—This company paid on October 1st a dividend of 10c. per share, amounting in all to \$10,000. This brings the total amount of dividends paid by the company up to date to \$722,253.

INTERNATIONAL.—This mine, lying between the Grant and the McDermott properties, was recently bonded to L. C. Parker and others for \$65,000. Mr. Parker has a force of men at work preparing to sink a shaft until the mother vein has been encountered.

JEFFERSON COUNTY.

GOLD CUP.—In this mine a vein of rich ore was recently uncovered which is said to run high in gold.

MINAH CONSOLIDATED MINING COMPANY.—On October 9th Henry N. Blake, special master in chancery, will offer for sale in Boulder eight mining claims in a suit in equity to foreclose a vendor's lien on this company's property.

ROCK OF AGES.—H. Estes is running a 1,400-ft. tunnel on this property.

RUBY.—Vanners and additional steam power have been installed and the mill was recently started up. The shaft at the mine is down to the 200-ft. level, where the lead is being crosstuck. New 200-ft. level, where the lead is being crosstuck. All steel rails have been laid the entire length of all the tunnels and everything put in shape to handle the ore. A new blacksmith shop and ore house are now in course of erection, and a new bunk house will be built at once. The present office building will be used for an assay office. Manager M. L. Hewett contemplates several other improvements and says the mill will be enlarged.

MADISON COUNTY.

Placer mining in this county has been retarded somewhat by the continued cold weather, and it is expected that operations will be entirely suspended within the present month.

Mining matters in the McCarthy, Highland and Tobacco Root ranges appear to be more active now than they have been for many years. The mining interests will be benefited materially by the three smelting plants, the Toledo, at Sheridan; the Twin Bridges, and that of the Parrot Company, at Gaylord, which will be put in operation in the near future.

BLUFF.—A discovery of what promises to be an extensive copper ledge has been made on this property, which consists of the following claims: Copper Belle, Populist, Silver Crown, Manhattan and George Washington. The owners are Thomas Bluff, James Lamb, Jane Bluff and Thomas S. Baylis. About three months ago the owners leased and bonded this property to John W. Coughlan, Richard J. Dwyer and John S. McGroarty. The amount of the bond is \$1,100. A lead-silver vein was at first uncovered, but after sinking some feet further a copper vein was discovered and at present the vein shows on both walls about 3 ft. of copper ore, and the intervening strata shows good lead ore. The company has let a contract for sinking a 150-ft. shaft.

GRUB STAKE.—This mine, near Red Bluff, was sold to Eastern capitalists recently. The amount has not been given out yet. The company has made arrangements with Mr. Alderson, of Red Bluff, who has control of the Mohegan mill, for the use of the batteries and steam part of his mill for the winter. In the spring the company intends erecting a plant of its own.

(From Our Special Correspondent.)

BERTHA MINE.—Operations are suspended for the present at this mine, located about six miles from Virginia City, as the ore bins are all full of ore, which cannot be treated until certain alterations in the mill are completed. The mill was designed by the manager, C. G. Hathaway, especially for fine crushing, as the gold in the ore is exceedingly fine. The crushing is accomplished by steel balls, and it is said the crushed ore will all pass through a 100-mesh screen. A saving of from 84 to 90% is claimed on an ore that will assay \$6 per ton.

EASTON MINE.—This mine, located about four miles west of Virginia City, is employing about 30 men. Three grades of ore are made, the first class being sacked and sold to the smelters, the second class treated in the amalgamating mill about four miles from the mine, and the third class concentrated at the mine. The property is well developed and shows large quantities of silver ore.

MISSOULA COUNTY.

United States Marshal McDermott has recently secured a controlling interest in a group of placer claims comprising 637 acres in historic Cedar Creek. It is said that the ground is shown by late development to be able to yield from 50 to 73c. to the yard.

SILVER BOW COUNTY.

CAMBERS.—W. B. Hamilton has secured a lease and bond on this mine in the Ground Squirrel district near Meaderville, and has a gang of men at work crosscutting at the 300-ft. level. Some high grade copper ore has been taken out from the 200-ft. level.

(From Our Special Correspondent.)

ANACONDA COPPER MINING COMPANY.—This company is sinking on most of its mines. At the Diamond the shaft is down close to the 1,300-ft. level. At the Green Mountain a station is being cut on the 1,600 ft. level. The High Ore shaft is down close to the 1,500-ft. level, the High Ore No. 2, 1,600 ft.; the Mountain Consolidated No. 1, close to 1,500 ft.; No. 2, 1,500 ft., with station cut. At the Never Sweat sinking is in progress below the 1,400-ft. At this mine a skip, holding eight tons of ore, is used in one compartment of the shaft, with a four-decked cage in the other hoisting compartment, the cage being the most convenient to hoist men and timber. At the Ramsdell-Parrot about 200 tons of ore is hoisted daily. About 40 men are employed.

COLORADO SMELTING AND MINING COMPANY.—At the Gagnon about 200 men are employed. At the 1,500 ft. level the vein is from 30 to 40 ft. wide; preparations are being made to sink below this level. About 500 tons of ore are hoisted daily.

MONTANA ORE PURCHASING COMPANY.—A meeting of the stockholders of this company is called, to be held at the office in Silver Bow Block, Butte, November 6th, to consider the advisability of increasing the capital stock from 40,000 shares to 100,000 shares, par value \$25 per share. This would be an increase from \$1,000,000 to \$2,500,000. The object is to increase the capacity of the smelting and concentrating plants, and to acquire and develop mining properties. At the Rarus about 750 tons of ore are hoisted daily, with about 200 men employed.

ROBERT EMMET NO. 1.—The owners of this mine, located about 1,900 ft. west of the Gagnon shaft, filed a petition in the district court September 26th, for a hearing and an order for an inspection and survey of the western workings of the Gagnon mine owned by the Colorado Smelting and Mining Company, alleging that that company has drifted into their claim and has extracted large quantities of copper and silver ore from veins that have their apex within the surface boundaries of plaintiff's claim.

NEVADA.

STOREY COUNTY—BRUNSWICK LODGE.

CHOLLAR MINING COMPANY.—The latest weekly official letter says: "The stopes on and below the 300 level show no material change for the past week. They are extracting about 7 tons per day of good ore from them. On the 500-ft. level they have advanced the south drift 12 ft. for the week, and are now out 547 ft. from the north line; the face is in porphyry. On the 600 level No. 1 east crosscut, started from the south drift 100 ft. south of the line, is now out 61 ft., having been advanced 27 ft. for the week; the face is in porphyry with small streaks of quartz through it giving low assays. No 2 east crosscut, 100 ft. south of No. 1, has been driven 33 ft., and is now out 57 ft.; the face in porphyry. Work in the main south drift has been resumed, and it has been advanced 63 ft. through soft ground, composed of clay and porphyry; total length from the north line 406 ft. Have been engaged in repairs at various points where required. Have shipped to the Nevada mill 106 tons, 1,500 lbs. of ore, the assay value of which was: Wagon sample, gold, \$17.64; silver 18.52 oz. per ton; top car sample, gold, \$17.67; silver, 16.56 oz. per ton.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—The latest weekly official letter says that on the 550 level east crosscut No. 1 on the tunnel level has been extended 10 ft. through hard porphyry; total length 878 ft. On the 650 level east crosscut No. 1, started at a point 600 ft. from the station, has been advanced 14 ft.; total length 25 ft. The ore shows an average assay value of about \$8 per ton in gold. East crosscut No. 2, started at a point 50 ft. south of No. 1, has been extended 9 ft.; total length 21 ft. The average assays show a value of \$12 per ton in gold. The main south drift has been extended 18 ft. in the foot-wall; total length 683 ft. On the 750 level they have cleaned out, repaired and timbered 100 ft. of the south drift."

STOREY COUNTY—COMSTOCK LODGE.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—The latest weekly official letter says that 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 20 ft., passing through porphyry, clay and narrow streaks of quartz assaying 50c. per ton; total length, 174 ft.: east crosscut No. 2 started from this drift 100 ft. south of the upraise has been advanced 12 ft., passing through porphyry, clay and quartz assaying 50c. to \$1 per ton; total length, 53 ft. On the 1,650 level from incline upraise No. 1, at a point 60 ft. above the sill floor of this level, the south drift skirting along the footwall has been extended 23 ft., passing through porphyry and quartz assaying \$1 to \$3 per ton; total length, 119 ft. From No. 2 upraise, at a point 65 ft. on the slope above the sill floor, the north drift has been advanced 4 ft., passing through porphyry and quartz assaying from \$2 to \$3 per ton; total length, 100 ft. From this north drift, at a point 70 ft. from No 2 upraise, an upraise has been started and carried up 14 ft., passing through quartz formation assaying from \$2 to \$10 per ton. On the 1,750 level, on the 11th floor north from the upraise, a west crosscut has been advanced 23 ft., passing through porphyry and quartz assaying from \$1 to \$2 per ton; total length, 53 ft. Work in the face has been suspended, and in the coming week a north drift will be started from about the center of the crosscut. No ore was extracted from the mine during the week.

CROWN POINT MINING COMPANY.—The latest weekly official letter notes a find which may be of importance. It says: "The south drift on the seventh floor of the 800-ft. level upraise has been extended 13 ft. during the week, and is now out a total distance of 320 ft. The face shows a width of 1 ft. of rich ore, wider in the bottom than in the top, east of which is a width of 1 ft. of clay and quartz mixed, assaying from \$17 to \$20 per ton. The rich streak is of fine character, and assays from \$150 to \$250 per ton. On account of the bad air in the drift we have stopped the same, and are now repairing the 800-ft. level south drift, with the intention of raising through for air."

GOULD & CURRY MINING COMPANY.—On the 400 level they have started to clean out the main tunnel in order to reach the old fills to extract 1,000 tons of rock to be milled. This ore will be sent to the Kinkead mill to be worked. If the experiment pays, more of this low-grade ore will be taken out and milled. It is believed that it will run about \$12 per ton.

MEXICAN MINING COMPANY.—The latest weekly official letter says that on the 1,000 level, in the north drift from the Ophir shaft station, 490 ft. in from the station, or 230 ft. north from the south boundary line of the mine, and opposite west crosscut No. 1, the east crosscut was advanced 25 ft., passing through porphyry showing clay separations and seams of soft vein matter; total length, 236 ft.

OPHIR MINING COMPANY.—The weekly official letter reports that on the 1,000 level, west crosscut No. 3 from the north drift, 125 ft. north of the shaft station, is in 462 ft.; the face is in porphyry showing clay seams and lines of quartz assaying 50c. per ton. In the old Central tunnel workings of the Ophir the south drift has been extended 3 ft., passing through porphyry and quartz assaying \$1 per ton; total length 255 ft. From the end of the drift a west crosscut has been started and advanced 6 ft., passing through porphyry and quartz assaying 50c. and \$1 per ton.

SIERRA NEVADA MINING COMPANY.—The weekly official letter says that in this mine (Layton tunnel) the south drift started on the pay streak at a point 22 ft. east from the bottom of the winze is now out 30 ft.; extended 20 ft. during the week; face in quartz yielding assays of from \$2 to \$5 per ton. On the 900-ft. level of the Union shaft workings the north lateral drift was advanced during the week 8 ft.; total distance 394 ft. north from the Sierra Nevada shaft and 153 ft. from west crosscut No. 3; face in porphyry. At a point 100 ft. north of west crosscut No. 3 they have started west crosscut No. 4 and advanced the same 10 ft.; face in porphyry with seams of clay through it.

UNION CONSOLIDATED MINING COMPANY.—The official weekly letter reports that the south drift from the upraise opposite the north drift, and 190 ft. vertically above the sill floor of the 900 level, has been extended during the week 24 ft.; total length 375 ft.; face in porphyry. This drift has been stopped. They are preparing to start an east crosscut from the south drift at a point 50 ft. south from the raise.

NEW MEXICO.

TAOS COUNTY.

IRON MASK.—The tunnel is now in about 80 ft. and a mineral blanket 15 ft. thick has been uncovered. There are 200 tons of ore on the dump. Assays made from the ore of this mine ran from \$5 to \$10.40.

NEW YORK.

SARATOGA COUNTY.

The gold mania is still spreading, in consequence of the reported rich finds in some of the properties. Among the claims recently filed with the Secretary of State at Albany are the following: Stephen V. Morton, Jr., of Corinth, at Luzerne; of John E. Quick, in Greenfield; by George P. Ide, in Wilton; James W. Lester, in Greenfield; George W. King, in Wilton; G. W. Edwards, in Corinth; Levi B. Dederick, in Corinth; John A. Delaney, two in Greenfield, and Edward J. Jones, in Luzerne.

The fee of the Secretary of State, to be paid in advance, for filing and recording notice of discovery is 15c. for every 100 words, usually amounting to from 30c. to \$1, according to length of such notice. When a certified copy of the notice filed is desired, the charge therefor is 15c. for every 100 words thereof, and \$1 additional for certificates and seal of office thereto.

OREGON.

JACKSON COUNTY.

ASHLAND.—Major G. W. Ingalls and A. T. Caldwell have secured possession of the tailings of this mine owned by H. J. Hicks and E. V. Carter. It is proposed to treat the tailings by the cyanide process, for which purpose a plant will be erected.

E. K. ANDERSON.—The placer ground on Bear Creek, just below the Golden Fleece mine, in Jackson County, has been bonded to Charles Bronson and E. B. Loomis, of San Francisco. It is said that the ground, which is quite rich, will be equipped with a good hydraulic plant for next season's work.

ORO FINO.—The ore from this mine is now being shipped to the mill at Ashland for sampling. There are about 50 tons of high grade ore on the dump. The old combination mill and arrastra went to pieces recently; hence the shipments to Ashland. Mr. Crane, the manager, has in contemplation putting in a 10-stamp mill.

JOSEPHINE COUNTY.

A large hydraulic mine is being equipped by Oscar Beer and Dr. Smith, both of Portland, on the east fork of the Illinois, about seven miles from Waldo, close to the California line. The ground covers about six miles of the river, and was formerly owned by A. Parrish, J. A. Tate, R. Brittain, Edward Riley and others. Three giants will be operated during the coming season.

DELAMATER.—A sale was recently made of the gold placer mine on the Illinois, close to the mouth of Josephine Creek, to John R. Foster. The consideration is understood to have been \$5,000.

HULL & BECK AND JUNCTION.—Efforts are making to consolidate these hydraulic mines on Louse Creek. The properties are contiguous, and have good water rights.

PENNSYLVANIA.

ANTHRACITE COAL.

CONYNGHAM.—This colliery at North Wilkes-Barre, in which a fire was raging for several years, and which was filled with water, will resume work October 15th. The water in the colliery has been pumped out.

DELAWARE & HUDSON.—After 22 years of idleness the top vein of No. 2 mine, at Olyphant, is being reopened for operation. The vein was first tapped 35 years ago. Mine Superintendent Grey and Mine Foreman John Lavin are in charge of the reopening. The work will give employment to nearly 100 men and boys.

PARRISH COAL COMPANY.—A heavy explosion of gas occurred in No. 2 slope at Plymouth, on October 5th, by which three men lost their lives.

NORTHAMPTON COUNTY.

All the quarries at Penn Argy are working full time, owing to the good export demand.

BANGOR ROYAL.—J. C. Cokefair & Son, of New York, have leased this slate quarry, and operations

will soon be resumed. The quarry has been idle for seven years.

WEST BANGOR.—This slate quarry is again in operation after an idleness of three years. It has been leased by J. M. Kress & Company. Thirty men are now employed.

SOUTH DAKOTA. HUGHES COUNTY.

WABASH GOLD MINING AND MILLING COMPANY.—Articles of incorporation have been filed recently for this company, with a capital stock of \$60,000, and headquarters at Custer City. The incorporators are J. Warner Hanna, Chicago; Thomas Carroll, Daniel E. Smith and A. T. Fea, of Custer City.

LAWRENCE COUNTY.

BANCROFT & AZTEC.—A boiler and a hoisting plant will be put on this property, and development work resumed at the joint shaft.

GOLDEN REWARD MINING COMPANY.—This company is installing two large 125-H. P. steel boilers, pumps, stacks, fixtures, etc., which were purchased from the Phoenix Iron Works. One of the boilers will be put in at the Tornado shaft at Terry to work the new air compressor plant, the hoists and the pumps. The other boiler will run the hoists and pumps at the Sundance shaft across the divide.

HARDIN MINING COMPANY.—This company recently received from Chicago a large new Blake pump, for the shaft at Two Bit which is nearly full of water. Work will be resumed at the mine as soon as the water has been pumped out.

JEWEL CROWN.—M. Eilenberg, Joe Craig and F. C. Woodburn, owners of the group of four claims on Richmond Hill, in the Carbonate district, are doing considerable development work upon the ground. A contract has been let to run a tunnel 50 feet long, and it is now in 26 ft. from the surface. A three-foot vein of silicious ore has been uncovered.

TENNESSEE.

During August 6,013 tons of phosphate rock were shipped from the Mt. Pleasant field, according to a correspondent of the *American Fertilizer*. The idea of washing the rock in order to clean it seems to be pretty generally abandoned by this time, and the only purpose of washers is to reclaim the small pieces from the dirt, as the large pieces are sent direct to the kilns without washing. The need seems to be for a very long screen to shake as much as possible of the dirt coating from the rock, as this is what contains the iron and alumina. The Perry County deposits on the Tennessee River are attracting some attention and may prove to be valuable on account of low percentage of iron and alumina. Hickman County blue rock is coming somewhat in demand again, and a number of miners are again at work there. The cause of this demand is due, first to some manufacturers having previously prepared to mix this rock, and not wishing to go to expense of changing to use Mt. Pleasant rock, and second, to other manufacturers desiring to give Mt. Pleasant rock a black eye in order to keep the price as low as possible. Mr. Chas. Michel, mining engineer of Paris, representing a proposed consolidation of several large French interests, has been in this field for the past month, investigating Tennessee phosphates generally and, in particular, to make a report on the value of the phosphate lands of the Blue Grass Phosphate Company, the Columbian Phosphate Company, and H. D. Ruhm. Mr. Michel left for France on September 9th.

POLK COUNTY.

PITTSBURG & TENNESSEE COPPER COMPANY.—This company intends at an early date to enlarge its plant near Ducktown by the erection of more roasting sheds and smelting in another 200-ton furnace.

UTAH.

(From Our Special Correspondent.)

Another unfavorable change in the general mining situation immediately followed the decline in silver on the closing days of September, proving that the previous better feeling was based almost entirely on the apparent strength of the white metal. No longer is there talk of the Ontario, Daly and Daly West at Park City resuming this winter, while the announcement of the stoppage of production by the Bullion-Beck is a severe blow to Tintic and the entire State. To-day the only owners of reliable producers who talk of continuing active operations are of those properties where either gold or lead afford the chief ore values. Outside of two or three mines this statement is correct and the forecast seems unavoidable that there will be but little more than half as many miners employed this winter as there were a year ago. Were it not for the new undertakings at Mercur the situation would be deplorable.

SHIPMENTS FROM SALT LAKE.—During the week ending October 2d there were sent East: 32 cars, or 1,167,025 lbs., lead-silver bullion; 42 cars, or 743 tons, lead-silver ore. For the month of September the shipments from Utah East were: 121 cars, or 4,503,924 lbs., lead-silver bullion; 4 cars, or 185,671 lbs., copper bullion; 199 cars, or 3,937 tons, lead-silver ore.

BEAVER COUNTY.

(From Our Special Correspondent.)

NORTH STAR MINING DISTRICT.—There are a few signs of life in this old mining locality, mainly due

to recent good showings in the Vicksburg, where a gold ore shoot is opened. No. 1 ore carries \$80 to \$110 gold and No. 2 gives \$20 to \$50. Col. E. R. Hawkins has a bond on this and adjoining ground. He claims to be backed by Eastern capital and states that if the present indications hold out he will soon have the old Milford smelter in operation.

OREGON SHORT LINE EXCURSION.—There were 48 participants on the special train of mining men last Saturday from Salt Lake, for the different districts of this county, Beaver Lake capturing the largest representation. About a dozen went to Frisco. Return tickets are good for 10 days and many will stay a week. As this is written they have hardly more than reached the ground. Every preparation has been made to show the visitors all that is to be seen.

IRON COUNTY.

(From Our Special Correspondent.)

STATE LINE.—James Hailey, a mining engineer, representing Capt. J. R. De Lamar, has completed an examination of this district. While his verdict is not so very rosy as some of the enthusiastic champions wished, it is on the whole favorable. In brief, he states that an encouraging beginning is made; though no veins are sufficiently opened to prove it the making of a reliable producing mine, yet there are numerous good prospects which ought to be further tested. Considering that the camp is isolated and hardly a year old, the lack of capital and other drawbacks, satisfactory progress has been made.

JUAB COUNTY.

(From Our Special Correspondent.)

TINTIC SHIPMENTS.—For the week ending October 2d the following ore consignments were sent forward: Bullion-Beck, 10 cars; Eureka Hill, 10 cars; Gemini, 16 cars; Centennial-Eureka, 8 cars; Mammoth, 10 cars; South Swansea, 6 cars, and from the Dragon Iron, 22 cars of hematite for fluxing.

BUCKEYE.—With the exception of 1,300 shares the assessment was paid on all the stock and at the delinquent sale, September 30th, 300 shares of this lot were sold at 4½c. The company is now free from debt and supplied with funds. Tunnel is being driven to connect with shaft. There is a likelihood of shipments being made soon.

BULLION-BECK.—On September 30th it was announced that ore shipments would be stopped until there is a more stable silver market. This course was decided upon at a meeting of directors the previous day, and was a great surprise, both in Tintic and Salt Lake. About 35 men are retained on development. A year ago the working force in mine and mill consisted of 240 men, and the ore reserves are said to show as well to-day as then. With the comparatively small lead percentage there is hardly a margin of profit in these shipping products while silver rules below 60c.

TREASURE HILL.—A small flood was opened in the crosscut prospecting for the vein, just as it was thought a paying ore body was within easy reach. The water flow is more than the pump can handle and operations are temporarily suspended.

UNCLE SAM.—Jesse Knight states there is no truth in the widely published report of the sale of any portion of this handsome producer to a foreign syndicate or any one else.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

BINGHAM SHIPMENTS.—For the month of September the total tonnage of smelting products forwarded from the camp was 3,710, being an increase of 857 tons over the August output. The mines making the largest shipments were: Old Jordan & Galena, 1,650; Winnamuck, 360; Highland Boy, 230; Phoenix, 200; Old Telegraph, 400; Fortune, 150; Grant Chief, 110; Petro, 100; Dalton & Lark, 100; Northern Chief, 80; Spanish, 60; Yosemite No. 1, 50; Neptune, 30 tons.

AMERICAN.—Tunnel is in 226 ft., face in vein matter with stringers of ore. Property is at the head of Big Cottonwood Canyon. R. C. Taylor has been developing during the season, and is sufficiently encouraged to continue.

DALTON & LARK.—It is given out that the mine is about to be unwatered and put in shape for a large production—good news, if true.

NIAGARA.—On September 28th, in Salt Lake, was held the annual stockholders' meeting of the Niagara Mining and Smelting Company, when the old board of directors was re-elected. Officers and directors for the current year are: Gilbert E. Paten, president; Samuel Huckel, vice-president, George B. Langley, treasurer; C. H. Schermerhorn, secretary; A. H. Kynett, W. H. Thomas was reappointed general manager. The examining committee were well pleased with the results achieved in handling the oxidized gold ores.

RED WING.—A main working tunnel 150 ft. below the old tunnel is being driven to cut the vein at about 350 ft. from the mouth, which will afford good backs of stoping ground. From recent exploration in the upper workings this new company expects soon to figure favorably among the lead-silver shippers.

WINNAMUCK.—Two contracts were let last week to drift 400 ft. east and 400 ft. west from the 400 station. This is the most extensive exploration now on foot in Bingham, and is expected to uncover bodies of heavy lead ore.

SUMMIT COUNTY.

(From Our Special Correspondent.)

PARK CITY SHIPMENTS.—In September the following were the ore and concentrate products handled by the Mackintosh sampler: Silver King concentrates, 2,147,070 lbs.; Silver King ore, 2,142,480 lbs.; Anchor concentrates, 781,335 lbs.; Anchor ore, 377,520 lbs.; Valeo ore, 5,460 lbs.—making a total of 5,453,865 lbs.

MARSAC MILL.—The 500-ton test run on Ontario mill tailings is finished. Superintendent Chambers says that no particulars can be supplied at this time, and whether favorable or not there is a likelihood of the Marsac continuing to treat this material until silver is higher and firmer.

ONTARIO.—About 25 men are still employed in timbering and hoisting ore at No. 3 shaft. Preparations for the final close-down steadily progress, which event will probably occur within a month. From the Ontario mill on October 1st there were shipped 29 bars of base bullion, containing 17,410 oz. silver.

VALEO.—Undoubtedly the wish is father to the thought in the belief of extensive gold ore bodies in and around Park City, but it looks as though Valeo will be the first to demonstrate the existence of a profit-paying chute. There is now an ore seam carrying \$18 to \$40 in gold, which shows evidence of permanency.

TOOELE COUNTY.

(From Our Special Correspondent.)

BONNEVILLE MINING COMPANY.—Articles of incorporation were filed with the Secretary of State September 30th, capitalization \$50,000; shares 50c., with 30,000 shares set aside for treasury purposes. Stock assessable, but no one assessment to exceed 2%, nor shall assessments be levied oftener than once in 90 days. Head office Salt Lake; annual meeting, first Monday in April. Officers and directors are: John Kirkman, president; George W. Larkin, vice-president; John Wells, treasurer-secretary; John R. Sands, Thomas Cunningham. Realty consists of Glencoe, Nellie, Pearl, and Mountain Peak lode claims in the Lake Side mining district.

DE LA MAR'S MERCUR MINE.—In the past the ground owned by Captain De La Mar was spoken of as the Golden Gate. With the recent additions, more especially since the incorporation of the De La Mar Mercur mines, the latter name is more appropriate, particularly as it is now so styled in the East and abroad. Exploration only serves to demonstrate new and unlooked-for values in this property. Another important uncovering was made last week in a strong quartz seam, with gold values considerably above the average. The first two cars of steel for the mill construction arrived October 1st. There will be 125 cars in all.

GOLD DUST.—An option is just secured on the Gold Dust consisting of some 200 acres north of the Geyser-Marion, by R. A. Wood, for London capitalists. In the next 90 days the worth of this tract is to be systematically tested. Men were put at work the day after the agreement was signed.

INDEPENDENCE.—The statement of the silver discovery in the last issue was incorrect, though it was as given by J. H. Conrad, who claimed to have just come from the property. In place of 18 ft. or more thick, the ore seam is 10 to 18 in., while the values are spotted and of small moment.

SALT LAKE & MERCUR RAILROAD.—September was the banner month for the railroad which unites Mercur to the outside world. The freight from Fairfield station was 2,060 tons, and the ore from Mercur to the mill at Manning amounted to 9,020 tons. Gross earnings for the month were \$7,000, of which a little more than \$2,000 were net. Material for the De La Mar and La Cigale mills, some 140 carloads, made the traffic heavy, and it will be larger this month, with the steel consignments for the former mill. For an 11-mile road, with 2½ miles of spurs and sidings, Manager J. G. Jacobs is well pleased with the showing.

SKULL VALLEY.—A stampede is on to Skull Valley in consequence of reported finds of ore resembling that of the Mercur gold zone. Samples assayed recently show \$15 to \$20 gold, and it is said there are large quantities of this ore. Tests are being made to ascertain if the values can be won by cyaniding. When it is remembered the average ore treated in the Mercur mill does not exceed \$8 the enthusiasm over \$15 to \$20 ore can readily be imagined.

WONDER.—Owing to an accident to the air compressor development is stopped for the time being.

WASHINGTON.

STEVENS COUNTY.

Development work has been pushed in Huckleberry camp, and several of the mines are making preparations to operate this winter.

WEST VIRGINIA.

GREENBRIER COUNTY.

Local papers report that Mr. R. B. Hansell, who has been prospecting in this county and Pocahontas, has located a large deposit of iron ore on Beaver Lick Mountain. He has also found some manganese ore.

M'DOWELL COUNTY.

The Circuit Court of the United States for the District of West Virginia, in the case of Henry McCormick vs. Max Lansburgh, has decreed that there shall be sold by Commissioners' sale on October 20th

in the City of Charleston for the sum of \$27,899, in addition to costs of sale, valuable coal and timber lands in the Flat Top coal region, containing 11,421 acres. This is part of 50,000 acres belonging to Max Lansburgh, lying on Panther Creek and its branches. In case, however, the amount bid for the land described fails to satisfy that ordered to be paid by the decree of the Court, with interest and costs of sale, then an additional tract of land lying between Beartown Branch and Dry Fork, containing 5,083 acres, will be sold. The terms of sale will be the payment of cash in hand of all costs of sale and one-fourth of the balance, and the remainder in 6, 12, and 18 months, with interest upon the deferred payments, the purchaser or purchasers giving notes with approved security.

FOREIGN MINING NEWS.

AFRICA.

GOLD COAST.

WASSAU GOLD MINING COMPANY.—This company reports that in the month of August 470 tons of ore were crushed, producing 505 oz. gold, an average yield of 1.07 oz. per ton.

TRANSVAAL.

ROBINSON GOLD MINING COMPANY.—For the eight months ending August 31st this company reports 120,272 tons of ore crushed in its mill. The total quantity of gold obtained was: From mill, 84,792 oz.; from tailings, 31,426 oz.; from concentrates, 36,110 oz.; total, 152,328 oz. The total yield gives an average of 1.27 oz. per ton worked in the mill. The large yield from concentrates is especially notable. The company reports a total net profit of £282,190 for the eight months.

ASIA.

INDIA—MYSORE.

OOREGUM GOLD MINING COMPANY.—For the eight months ending August 31st this company's 120-stamp mill worked a total of 45,587 tons of ore. The gold obtained was 37,347 oz., of which 31,921 oz. were from the mill by amalgamation, and 5,426 oz. from tailings by cyaniding.

AUSTRALASIA.

NEW SOUTH WALES.

BROKEN HILL PROPRIETARY COMPANY.—For the four weeks ending September 16th the company reports 26,111 tons worked. The refinery output was 310 oz. gold, 499,690 oz. silver, 1,816 tons lead and 39 tons hard (antimonial) lead. In addition the contents of the copper matte made are estimated at 19,170 oz. silver and 29 tons copper.

The latest telegram says that the fire in the mine is now closely confined. No ore has been lost, and the output will not be diminished.

CANADA.

BRITISH COLUMBIA—BOUNDARY CREEK DISTRICT.

(From Our Special Correspondent.)

ELMORE GROUP.—This comprises the Elmore, the Corydon and the Henrietta claims situated between Sutherland and Baker Creeks, two miles from Christina Lake in the Grand Forks mining division of Yale district. There are several large ledges on this property, one of them being 50 ft. wide showing a mineral body from the surface. From this a large piece was recently sent to Rossland and there exhibited, attracting a good deal of attention, as at first sight it appeared to be ore, but on a close examination it proved to be a piece of the country rock well mineralized. A shaft 6 x 7 ft. has been sunk 12 ft. deep on this ledge. The mineral portion consists of iron and copper pyrites, carrying gold and copper. This property is owned by parties in Rossland.

BRITISH COLUMBIA—REVELSTOKE.

(From Our Special Correspondent.)

ALBERT CANYON.—There is considerable activity at this point. The situation is 7 miles west of Illecillewaet, near Revelstoke, on the main line of the Canadian Pacific Railway. About 50 men are employed on the Waverley and Tangier claims purchased recently by the Grant-Govan syndicate from Thomas E. Marshall and Ole Sanberg. The price stated was \$75,000, the last payment having been made August 1st. The new management is now building a wagon road to the mines and ore will be shipped by the middle of October. On the Tangier, the workings have gone through 15 ft. of solid gray copper and galena ore without reaching the hanging wall. On the Waverley, a competent authority informed your correspondent that the lead is 50 ft. wide, with a pay streak of 6 ft., much of which is concentrating ore.

BRITISH COLUMBIA—SANDON DISTRICT.

(From Our Special Correspondent.)

The rise in silver has given a new impetus to mining in this district. The Ruth and the Payne are shipping between 40 and 60 tons a day. An accident at the Slocan Star has caused the mine to be closed down for a couple of days. An accumulation of water in certain fissures above No. 4 level caused the hanging wall to slide down and break the timbers. Fortunately, as soon as the water had escaped the ground was caught up again and everything now is working as smoothly as ever.

The ore shipments in the Sandon district are increasing right along—being exactly double what they were last year. Great activity is expected as soon as the snow falls and rawhiding begins.

BRITISH COLUMBIA—SLOCAN CITY DISTRICT.

(From Our Special Correspondent.)

A shoot of high grade ore has been struck on the Chapleau, a claim on the northeast fork of Lemon Creek. A shaft 25 ft. deep has been sunk on the ledge and shows the lode to be 2 ft. wide at the bottom, 1 ft. of which is shipping ore with value mostly in gold. Fifteen tons have been sacked ready for shipment.

The Two Friends, also of the Slocan City District, on the divide between Lemon and Springer Creeks, is pursuing development work. A tunnel is being run to tap the ledge at a depth of 80 ft. This is a high-grade galena proposition. Their last shipment of nine tons gave a net smelter return of \$240 a ton.

The Howard Fraction is still progressing. A force of 19 men is at work. It is expected they will put up a stamp mill or concentrator by next summer.

The Arlington is working over 20 men, doing mostly development work, awaiting better transportation. It is said their last carload shipped reached a very high figure.

On Ten-Mile Creek very little work is being done. The Enterprise, owned by Messrs. Finch & Hoffman, which up to a week ago was employing 45 men and was shipping five tons a day of high grade galena, has closed down. Change of management accounts for this, it is said.

The U. & I., on Ten-Mile, is working six men. It is a galena proposition and is under bond for \$140,000.

The Meteor mine, on Lemon Creek, is now a shipper. It is owned by Messrs. Finch & Hoffman. Forty tons have been taken down to Slocan City lately for shipment. The lode is of quartz, carrying mostly gray copper and silver sulphides.

It is said this lot will go over 200 oz. in silver, with some gold.

(From Our Special Correspondent.)

BRITISH COLUMBIA BULLION EXTRACTING COMPANY.—Mr. L. H. Webber, the representative of this company in Rossland, states that the preliminary work for the erection of the reduction works, near the O. K. mine, is to begin immediately. This work is to consist of a railroad siding, 4,000 ft. of flume, ore bins and excavation. A large force of men will at once be put to work. Mr. Thomas W. Fisher, of Helena, who has for some time been engaged in making the drawings and plans of the proposed works, is to have charge of the construction. This company intends to give particular attention to the low-grade silicious ores of the camp, which in most cases are closely associated with the heavy sulphide ores. Nearly all ores of this class at present are discarded. The value of the ore to be treated in this way will range from \$6 to \$15 per ton. The Pelatan-Clerici process will be mainly used. The works will not be ready for custom business until the spring of 1898.

CENTER STAR.—This company has so far shipped about 824 tons of ore. It has now the fifth place in the list of shipping mines in the Trail Creek district.

CLIFF.—The management of this mine has lately been developing a promising vein near the upper tunnel. Small shipments of ore are being occasionally made.

CROWN POINT.—Three shifts have been at work on the upraise connecting the tunnel with the main shaft. No ore has been found in the tunnel, but there is a good showing of ore in the bottom of the shaft.

ELSIE.—This property has emerged from its embarrassments. A new set of officers has been elected, as follows: J. L. Whitney, president; Leo H. Schmidt, vice-president; Edward Baillie, secretary-treasurer. The directors in addition to the officers named are A. J. Lockhart, Michael Mones and Ernest Kennedy. A systematic effort is now being made to develop the property.

IRON COLT.—The management of this mine has installed a five-drill compressor.

JOSIE.—Work in the various drifts of this mine continues. The company has not yet convened for the purpose of considering the proposal for the purchase of the property by Mr. Thomas Rickard, of London, when he was recently in Rossland.

JUMBO.—Development work on this property continues. The management is endeavoring to reach pay ore beyond the present workings.

BRITISH COLUMBIA—WEST KOOTENAY.

(From Our Special Correspondent.)

WESTERN DISTRICT.—This includes the Boundary Creek and tributary divisions, including Okanagan, which is fast coming into prominence. The camps included in this district, which extends at least 200 miles west and about 100 miles north, are the Skylark, Central, Providence, Deadwood, Summit, Evans, Greenwood, Wellington, North Forks, Long Lake, Brown, Caron, Grand Forks, Copper, Graham and Smith and McKinney, in all comprising about 545 claims, from the mere prospect to the fully developed mine, as represented by the Cariboo at Camp McKinney. It is a quartz country, in which the stamp mill is already playing an important part.

NOVA SCOTIA—CAPE BRETON.

DOMINION COAL COMPANY.—This company reports its output of coal in September at 850,066 tons. For the nine months ending September 30th the

production was 850,066 tons, against 817,267 tons in the corresponding period of 1896.

QUEBEC.

GILBERT BEAUCE GOLD MINING COMPANY.—This company has been incorporated to work mineral lands in the district of Beauce, near the Quebec Central Railroad, where it is said that gold has been discovered. The incorporators are: P. Angers, L. Boiven, A. Fortier, J. Gotbout, B. Letellier, St. François; E. Soubier, Ste. Marie de Beauce; G. C. de Levy, Quebec.

MICA MANUFACTURING COMPANY.—This company is pushing work on the development of its Phosphate King mine, near Templeton.

ONTARIO—RAT PORTAGE DISTRICT.

(From Our Special Correspondent.)

BALD INDIAN BAY MINING COMPANY.—Mr. Burley Smith has already commenced work in Bald Indian Bay. The drivers are at present at work laying the foundations for the steel cylindrical shaft, which will be sunk in about 21 ft. of water. A large crib is being built in Rat Portage 60 ft. square, which will be towed out to the bay when completed.

GOLDEN HORN.—This property, situated on Rush Bay, about 30 miles from Rat Portage, is being developed by Messrs. Rideout & Hemmings, who have at present a shaft down 22 ft., and are arranging to ship a sample of the ore to the reduction works. Visible gold is found in most of the vein matter.

GOLD HILL MINE.—Mr. Tom Smith has just been given a contract to bore some three or four hundred feet with the diamond drill at the Gold Hill Mine. The work will be commenced this month on the Pebble vein, on which a shaft 120 ft. has already been sunk.

ONTARIO MINING COMPANY, LIMITED.—This property is situated about a mile from the Mikado mine and is being operated by Mr. J. W. Engledue for an English company. There are 14 veins on the location, 12 of which have been prospected. Pits have been sunk on the more promising and excellent surface showings have been obtained. Two 50-ton lots of ore are being treated at the Mikado mine.

SULTANA MINE.—A description in the Rat Portage News of October 2d says that the main shaft is now down 360 ft., with 1,000 ft. of drifting distributed over five levels. The vein being lenticular in form has narrowed and at times almost pinched out, but the lead is never lost. Up to the present time the mine has been operated by a plant consisting of a few light drills and a 10 stamp mill, which latter, by the way, has come in for a lot of criticism by certain experts, for the reason that it did not save as much of the gold as it should, but Mr. Caldwell claims that that he is getting from 75 to 80% of the gold in the ore in the batteries and on the plates, and 10% more in the concentrates, or from 85 to 90% altogether. Machinery of high capacity is now being installed; the capacity of the mill is to be increased five times. At present 30 head of stamps are being put in place, but room and power are being supplied for 50 stamps. The mill is to have Gates crusher, vanners, etc., and will have a daily capacity of 80 tons of ore. A new chlorination plant will handle the concentrates. In the new mill, which is being put up on the side hill beside the old one, gravitation will be taken advantage of in conveying ore from the shaft. In order to keep this mill going skips and a 75-H. P. hoisting engine are being installed, together with pump and a compound duplex air compressor, capable of furnishing power to 10 or 12 drills. Only eight, however, will be run this fall. There is a large quantity of ore in the five levels ready for stoping, so that with the extra drills there will be no difficulty in getting out the necessary 80 tons per day. From the new shaft-house, now in course of erection, the rock will be run on a level tramway to the crusher. The mine has a water power system and an electric light plant of its own. Most of this machinery is made in Canada, being furnished by the Jenckes Machine Company, of Sherbrooke, Que., and the Canadian Rand Drill Company.

WINNIPEG CONSOLIDATED.—A gang of men is at present emptying the main shaft on this property. The mine has been idle for the last 10 years and has the first stamp mill to be erected in the district still on the location. The mill, which consists of five stamps, was brought in over the wagon road from Winnipeg before the Canadian Pacific Railway was built.

MEXICO.

SINALOA.

(From an Occasional Correspondent.)

Gold mining in Sinaloa still continues to be an almost insignificant industry, notwithstanding the fact that there is to be found here every inducement for its profitable and successful development. As stated before in the *Engineering and Mining Journal*, there is a gold belt running from the State of Sonora, to the north, right through this State and down further South through the Territory of Tepic. Its width is an unknown quantity, but it will run into several miles. The only gold mining camp so far worked to any extent is San José de Gracias. This camp was for years lying almost unheeded, desultory mining by the natives on a very limited scale proving it well worthy of the attention of capitalists; but more seemed ready to believe that this section of Mexico was good for anything but

silver mining. In 1889 the writer, after some months' prospecting, obtained a bond from the owners for \$50,000 (Mexican silver) on all the principal mines then discovered, as well as a 10 years' concession over some 70,000 acres from the Mexican Government, but not being able to obtain the necessary financial assistance he let the matter drop. In 1893 the representative of an English company, working silver mines within a day or so journey from San Jose de Gracia, arranged to buy some of the above mines for \$150,000 half in gold and half in silver, and before the time for payment was due they had more than paid the purchase money out of profits made by working, and have since taken out enough to pay back the purchase money 10 times over.

A day's journey on mule back, south of San Jose de Gracia is a village called Bacubirito, on the Sinaloa River. Here exist immense gravel deposits, all auriferous, which have been worked on and off for a century or more, but on a limited scale, and in the most primitive way. In almost any other country this would be the scene of great activity and an important gold production, but notwithstanding the annual production of gold dust and nuggets is probably \$20,000—all of which is obtained by native placer miners with their bateas—no one has so far been found able and willing to devote the necessary capital and intelligence to work on a modern and extensive scale.

Last year some enterprising American merchants of Mazatlan denounced a portion of the river with its adjacent old channels and gravel banks, but although some attempts have been made to interest foreign capital, nothing definite has been done or accomplished. Two nuggets were recently found here on the surface, after heavy rains had washed away some of the surface soil. The largest weighs 995g, say 32 ozs. troy and the smaller one 314g, or over 10 ozs. troy; the former has considerable quartz embedded in it. It will probably appear strange to those who are unacquainted with this section that the finding of such nuggets did not have any exciting effect on the inhabitants, but nevertheless it is the truth and the only result so far as the writer knows is that the above mentioned American merchants have denounced more ground.

At the point on the Sinaloa River, where these nuggets were found, a tunnel 192 meters long would drain several miles (about 12 miles) of river bed, known to be rich in gold, while the difference in height of the two bends will give 80 ft. fall, which would furnish all the power required to carry on the work, and later prove a valuable water power for manufacturing purposes.

Still further south is another gold mining camp known as Quebrada Honda. Large quartz lodes from 10 to 30 ft. wide can be traced for miles. On one of them a tunnel has been driven 800 ft., and the average of quartz is stated to be $\frac{1}{2}$ oz. gold per ton. *Mañana!*—to-morrow!—something will be done all ways to-morrow.

Nearer the port of Mazatlan, about 50 miles by road, are the old Spanish mines of Rosario. The production has been enormous both in gold and silver. There are blanket veins of great thickness commencing nearly perpendicular. The principal mine or group of mines is the Tajo, owned by an American company, which crushes daily 150 tons in an 80-stamp mill. Recently a body of rich ore was encountered running up to \$5,000 a ton in gold.

One hour and a half east from Rosario are the old historical Spanish gold mines of Habal. Pretty well authenticated reports have been handed down as to their great gold production, but with the exception of the removal of the remains of the old dumps, which were very profitably worked in Rosario, nothing further has been done and the old openings have fallen in. The writer managed to obtain some of the quartz from an old working, which assayed 8 oz. free gold. Close to these mines was the lost mine called Zapotillo, which has recently been re-discovered and the vein found, 90 ft. from surface, to be 5 ft. wide, assaying over 1 oz. gold per ton besides silver. This mine was also known by report to be rich, but the old works, which were situated in a large arroyo, or bed of a stream, were filled in with sand and water. Eight years ago a rich merchant of this port spent some \$7,000 hunting for the vein but failed to find it—this failure had deterred others from making a fresh attempt, until this year, with above mentioned result.

One other old Spanish gold camp, Las Uvas, some 50 miles northeast of Mazatlan, has also recently been reopened and two veins have been worked with most encouraging results. They vary in width of pay ore from 1 ft. to 6 ft. and carry from 1 oz. gold to 10 oz. silver per ton. Here again want of capital to carry on work and put up reduction works is hindering development.

Probably these few instances sufficiently show that the gold belt described is a very interesting one and sooner or later must attract the attention it deserves. With the facilities for working all the year round—plenty of wood and water—and the immense advantage of paying for all labor (not advanced in price since fall of silver) and most supplies in Mexican silver at par, while gold is at a premium of 140%.

SOUTH AMERICA.

BRAZIL.

OURO PRETO GOLD MINING COMPANY.—This company reports for August that 5,546 tons of ore from the Passagean mine were worked, producing 1,940 oz. gold, an average of 0.35 oz. per ton.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, October 8.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending October 1st, 1897, compared with the corresponding period last year:

	1897.		1896.
	Week.	Year.	Year.
Pennsylvania Railroad.....	95,502	2,608,258	2,669,213

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

	1897.		1896.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	53,069	1,612,560	1,740,268
Barclay, Pa.....	640	32,075	33,105
Beech Creek, Pa.....	87,192	2,327,716	2,193,216
Broad Top, Pa.....	*	330,202	287,851
Clearfield, Pa.....	93,141	1,852,692	3,482,174
Cumberland, Md.....	*	2,842,796	2,602,797
Kanawha, W. Va.....	189,263	3,378,969	2,728,333
Phila. & Erie.....	5,424	187,396	37,048
Pocahontas Flat Top.....	*	181,972	2,601,166
Totals.....	328,759	13,446,288	15,725,958

	1897.		1896.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	31,456	822,522	953,367
Pittsburg, Pa.....	38,071	1,438,336	1,431,418
Westmoreland, Pa.....	46,972	1,630,028	1,416,558
Totals.....	112,499	3,890,886	3,801,343

Grand totals..... 448,258 17,337,174 19,527,301

Production of coke on line of Pennsylvania Railroad for the week ending October 1st, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 108,871 tons; year, 3,109,896; year to corresponding date in 1896, 3,037,871 tons.

* For week ending September 21st. * Returns not received.

Anthracite.

The anthracite coal trade is a waiting one just now; demand is quiet and prices are weak. Dealers in the East, especially in the New England States, have pretty large stocks on hand, while in New York and vicinity a similar condition prevails, though not in the same proportion. The operators are moving coal as fast as they can from the mines, and in the majority of cases are working four days a week just now. The car supply is rather limited at present, owing to the general demand from the grain and other districts in the West. It is contended that the Western roads find it more profitable and advantageous to use their cars for carrying grain, and in most cases the coal railroads will not permit their cars to go to outside roads, fearing that they will not be returned for some time. In consequence of this the coal operators are in a quandary as to how they will transport their west-bound coal. So far the shortage of cars has not affected them very seriously, as the demand for coal has not materially increased. Nevertheless, it is feared by some operators that they will not be able to ship their full allotment this month should cars for Western business continue to be so scarce as they are now. Another matter which is usually detrimental to the coal mining industry is the scarcity of water, which is sure to come soon unless we have rain. As yet the operators have not given it serious thought, but in the coke regions we understand some of the ovens have been compelled to blow out on this account.

Though there are some operators who estimate the production for October at from 4,000,000 to 5,000,000 tons, it is believed by the conservatives that 3,500,000 tons would suffice. At this latter rate the allotments for that month would be about as follows: Philadelphia & Reading, 717,500 tons; Lehigh Valley, 547,750 tons; Delaware, Lackawanna & Western, 467,250 tons; New Jersey Central, 409,500 tons; Pennsylvania Railroad, 399,000 tons; Delaware & Hudson, 336,000 tons; Erie, 140,000 tons; Pennsylvania Coal Company, 140,000 tons; Coxe Brothers & Co., 122,500 tons; New York, Susquehanna & Western, 112,000 tons; New York, Ontario & Western, 108,500 tons. Whether the companies will adhere strictly to their percentages or not is a matter of conjecture. For July and August the shipments were about 1,500,000 tons above the allotments. The figures of production for September have not yet been given out, but it is safe to assume that it was on a basis of 3,500,000 tons. The stocks on hand on September 1st are said to have been small.

There still continues to be more or less talk of cutting of schedule prices. Sales are understood to have been made of chestnut coal at as low as \$3.40 on board, and stove at \$3.90 on board. These prices are 60 and 85c. below the July circular. It is also intimated that some sales agents in the trade have been quoting a price lower than any which has ruled thus far this year. In consequence of this prices are rather demoralized, and should a new circular be established (which is not very likely) the sales agents may be able to hold to the July schedule, otherwise there will continue to be more or less shading. Of course several of the companies will say that the low prices given above were made on inferior or slaty and rusty coals. Be that as it may Lehigh coal, which has always sold above any other kind, is being sold at less than the July circular.

The supply of chestnut coal continues to be large, while the demand is limited. The inquiry for egg coal is very good at present, while broken coal is being taken up almost as quickly as it is mined. Retailers here report that householders have not yet put in their coal for the cold weather, but a good business is expected soon from this source. The demand in the West continues good, though prices are a little weak. Shipments are being made in good quantity to the Western cities, and coal is being stocked up there for later consumption. Industrial enterprises all over the country are starting up in fairly good shape, and from this source there promises to be a good demand for the steam sizes of coal.

We quote prices as follows: Broken, \$4; egg and chestnut, \$4.25; stove, \$4.50 per ton alongside New York.

NOTES OF THE WEEK.

The Schuylkill Coal Exchange gives notice that the Philadelphia & Reading collieries drawn to return prices of coal sold in August, 1897, to determine the rate of wages to be paid, show an average price of \$2.65, and the rate of wages to be paid for the last half of September and the first half of October, 1897, is 5% above the \$2.50 basis.

Bituminous.

The seaboard soft coal trade is reported generally as dull and quiet, but it is noticed that the tonnages from the producing regions are kept up fairly well. It is believed that there is a fight to place all the coal thus shipped. There has been some transient trade during the week, consisting of odds and ends from dealers and consumers. The consumers are generally ordering a fair quantity of coal but are resting to a great extent upon the coal that they have put in during the summer and which has accumulated up to the present time. The consumers, fearing that they will not be able to procure more coal, are using up some of the coal they have already in stock.

Prices are generally weak, and if there was a margin to reduce the probabilities are that a reduction would be made on some of the coals at least. Most of the producers have been naming a price which nets them at the mines a minimum of profit, and the railroads also have got down to about cost, so any further reduction would have to come out of the good dollar that it costs to place the coal at the desired point.

Trade east of Cape Cod has shown a slight improvement during the week, though it is not very marked. A few orders have been coming from the ice ports to fill up any hole in stock that may have been made by consumption before ice makes. In the Long Island Sound business the consumers seem to have about all the coal they want in their yards or on the way, and are not at all anxious for further shipments at the present time, though it is anticipated that there will be an improvement in the demand from this locality during the coming week. New York harbor trade is working along in the regular way, and the usual amount of tonnages is forwarded to the various consumers in this district. Trade local to the shipping ports is quiet, and little outside of the customary tonnages is being shipped. Transportation from mines to tide continues poor, and except in one or two instances is nearly 48 hours behind the schedule. The car supply is fairly good, though there is no surplus to be found in the hands of the railroads. Embargoes to foreign road points off main lines continue. In the coastwise market vessels seem to have fallen off in supply, and freight rates incline towards a stiffer basis. The demand for vessels, however, is not great, and these two facts may result in maintaining the situation unchanged for the present at least.

We quote current rates of freight from Philadelphia: To Boston and Salem, 65c.; Portland and Portsmouth, 65@70c.; Providence, New Bedford and the Sound, 55c.; Lynn 75@80c.; Newburyport, 80c.; Dover, 90c. and towage; Saco, 85c. and towage; Bath, 70c.; Gardiner, 70@75c. and towage; Bangor, 70@75c. Five and 10c. above these rates are asked for the further lower ports.

Buffalo.

Oct. 7.

(From Our Special Correspondent.)

Notwithstanding the assertions made that an thracite coal would be advanced 25c. on October 1st, no higher figures have ruled since that date. Trade continues quiet, with warm weather, until yesterday, when a change to a cooler atmosphere occurred. Bituminous coal is fairly active at nominally unchanged quotations. Supply ample for all the demands of consumers, whether vessel-men or manufacturers.

The death of Mr. George H. Lewis, formerly of the Bell, Lewis & Yates Coal Company, occurred last Saturday morning. He was highly thought of by the community at large, and his death is much regretted.

The shipments of coal westward by lake from Buffalo for the week ending October 2d, inclusive, aggregated 75,955 net tons, distributed as follows: 39,650 tons to Chicago, 6,300 tons to Milwaukee, 11,800 tons to Duluth, 1,675 tons to Toledo, 1,500 tons to Gladstone, 530 tons to Muskegon, 6,500 tons to Manitowoc, 400 tons to Sault Ste. Marie, 800 tons to Ashland, 400 tons to Grand Haven, 2,000 tons to Oscoda, 2,900 tons to Ft. William and 1,500 tons to Green Bay. The rates of freight were 20c. to Chicago, Milwaukee, Duluth, Toledo, Manitowoc, Ft. William and Ashland; 30c. to Windsor; 25c. to Sault Ste. Marie and Green Bay, and 50c. to Grand Haven. A

few loads were taken to Chicago at 30c. one day early in the week, but the rate was not maintained. Closing quiet and firm, with 30c. paid to Lake Michigan ports this week.

The following statistics of the coal trade of Buffalo from January 1st to September 30th, 1897, with comparisons of previous years, were compiled by Mr. William Thurstone, Secretary of the Merchants' Exchange:

Receipts of coal by railroad not reported by request; receipts by lake for September, none, and none for several years past. The shipments by lake for September, 255,030 net tons, as compared with 337,047 net tons in 1896 and 362,155 net tons in 1895; for the season to October 1st, 1,206,601 net tons, as compared with 1,574,081 net tons in 1896 and 1,494,181 net tons in 1895. Receipts by canal for month of September, 1,011 net tons, as compared with 4,914 net tons in 1896 and 4,684 net tons in 1895; for the season to October 1st, 5,749 net tons, as compared with 24,260 net tons in 1896 and 10,166 net tons in 1895. Shipments by canal for September, none, as compared with none in 1896 and 1895; for the season to October 1st none, as compared with 759 net tons in 1896 and 4,289 net tons in 1895. The aggregate shipments of coal this season to October 1st show a decrease under 1896 of 367,480 net tons and 287,580 net tons under 1895.

Lake freights on coal from Buffalo for September this year were 20c. to Chicago, Milwaukee, Duluth, Lake Superior ports, Detroit and Toledo; 25c. to Green Bay and Bay City; a year since the rates were 20c. to Chicago, Milwaukee, Duluth and Lake Superior ports, Green Bay, Toledo, Detroit and Gladstone; 20@25c. to Racine, 40c. to Saginaw and 2c. to Bay City.

The shipments of coal by lake thus far this season to October 1st were distributed about as follows: 316,043 net tons to Chicago, 211,957 tons to Milwaukee, 177,700 tons to Duluth, 11,750 tons to Racine, 18,925 tons to Green Bay, 138,039 tons to Superior, 500 tons to Kelly Island, 6,280 tons to Kenosha, 1,110 tons to Grand Haven, 6,710 tons to Saginaw, 1,940 tons to Manitowoc, 800 tons to Menominee, 300 tons to St. Ignace, 1,500 tons to Cleveland, 850 tons to Marinette, 2,025 tons to Oscala, 179 tons to Penetanguishine, 45,415 tons to Toledo, 14,050 to Gladstone, 4,900 tons to Washburn, 600 to Portage, 2,200 tons to Detroit, 700 tons to St. Joseph's, 2,200 tons to Ashland, 5,650 tons to Hancock, 1,200 tons to Port Arthur, 3,771 tons to Lake Linden, 400 tons to Marine City, 390 tons to Mackinac City, 800 tons to St. Clair, 1,300 tons to Muskegon, 1,400 tons to Escanaba, 800 tons to Marine City, 530 tons to Windsor, 100 tons to Traverse City, 7,300 tons to Marquette, 135 tons to Alpena, 700 tons to Benton Harbor, 850 tons to Sturgeon Bay, 8,838 tons to Fort William, 3,420 tons to Port Huron, 500 tons to Byng Inlet, 6,550 tons to Bay City, 2,650 tons to Sault Ste. Marie, 1,100 tons to Amherstberg, 330 tons to Sand Beach, and 360 tons to East Tawas.

The New Queen City Gas Company, of Buffalo, promises to supply gas to our citizens at 50c. per 1,000 cu. ft.

The Fire Department of Buffalo has accepted the bid of Mr. Hanrahan as follows: 1,700 net tons more or less of Pittsburgh steam coal at \$1.73 per ton, and 1,000 net tons of anthracite at \$1.60 per ton of the three sizes, stove, egg and chestnut, to be delivered as wanted during the current year.

Chicago, Oct. 6.

(From Our Special Correspondent.)

Anthracite Coal.—Sales have improved somewhat and shipments to out-of-town points show considerable increase, due probably to the fact that the Western roads are making a special rate on coal to Missouri River points. In and about the city there has been increased buying, and this has apparently been due to the near approach of cold weather and the possibility that prices may increase at any time. As yet, however, the real winter trade has not set in. Prices are still liable to fluctuations and those quoted as circular are: Grate, \$5.35; egg, stove and chestnut, \$5.60.

Bituminous Coal.—Soft coal remains in fair demand and the supply is now ample for all immediate wants. More soft coal is moving to town and soon there will be quite a stock in and about the city. Prices obtained are fairly good. Out-of-town trade has increased in volume and the larger consumers in town are calling more rapidly for coal on orders already placed.

Pittsburg, Oct. 7.

(From Our Special Correspondent.)

Coal.—The situation is a good deal mixed as the miners fail to agree among themselves; most of the Fourth Pool mines are reported in operation at \$1.57 per 100 bu. for mining. The mines said to be running are Snow Hill, Beaumont, Little Alps, Jack Jones, Rostraver, Crescent, Climax, Stony Hill, Chamount, O'Neil, Jutte, Blythe, Jones & Laughlin, Clipper, Empire and Albany. Some of these have not yet complied with the new mining law. It will be a difficult matter to establish a 25c. differential unless the lower pool miners accept a reduction from the Columbus rate.

All the harbor craft are busy supplying the local merchants, hence business has begun to brighten among the coal shippers.

The new coal-weighting law is to be tested in the courts. Suit has been brought against S. S. Brown, coal operator, for alleged violation.

The mines in the railroad district have been running full time the past week, and immense coal trains have been sent out to the lakes.

The house coal trade is brisk at present; prices

have not changed. We quote: 1½-in. railroad coal at 90c. per ton f. o. b.; Pittsburgh river coal, 3@3¼c. per bushel on wharf.

Connellsville Coke.—Trade is keeping step with the iron trade in the march of improvement. Existing coke contracts cannot be secured for 1898 delivery at present prices. The H. C. Frick Company has fired up the Tip Top plant, 121 ovens, which has been idle since 1895; 150 men were employed. The same company is putting into blast 200 ovens at Brownfield which have been idle since 1894. The works of the Redstone Coal, Coke and Oil Company, which owns 3,000 acres of coal at Grindstone and whose plant has practically been out of operation since 1894, are being repaired for resumption of work.

It is said on good authority that on January 1st the Frick Coke Company will advance the price of furnace coke to \$2 per ton; the present price is \$1.50. The week's report shows 18,399 ovens, of which 12,945 are active and 5,454 idle. The shipments were 137,250 tons; an increase over preceding week of 2,675 tons. It is predicted that 14,000 ovens will be in operation November 1st. In the running order 5,952 ovens made six days; 6,410 ovens made five days; 90 ovens four days and 50 ovens, Semet-Solvay, seven days. Week's shipments were as follows: To Pittsburgh, 3,230 cars; to points West, 3,410 cars; shipped East, 1,260 cars. Total, 7,900 cars.

Water is becoming scarce in the coke regions, some of the plants being compelled to close down for this cause.

In our last issue a report was mentioned that the H. C. Frick Coke Company had arranged to buy the coke plant of W. J. Rainey. We are now positively informed not only that there has been no sale, but that there have been no negotiations for such a purchase.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Oct. 8, 1897

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Oct. 9, 1896.	Oct. 8, 1897.	Jan., '96.	Jan., '97.	Tons.	Tons.
Anthracite.	31	18,050	22	13,150	984,810	600,212
Coke.....	15	108,180	118	168,275	6,027,684	5,398,632
Charcoal...	23	6,420	21	4,625	231,485	168,632
Totals	149	132,650	161	186,050	7,243,979	6,167,476

The iron market continues to show gains in activity and some improvement in prices. The Western demand continues strong, though the first rush is over, and in the East there is a further increase in orders which is encouraging to furnace and mill men. As in previous weeks, the improvement is somewhat uneven, but is quite sufficient to put the market on a solid basis.

Sales of raw material have been large, and though the production of pig iron is rapidly increasing the supplies are taken up without difficulty. Bessemer pig has had a slight set-back in consequence, it is said, of the marketing of some large speculative holdings. For foundry iron a steady demand has set in, and there is no difficulty about making sales. There is a good deal of talk going on about contracts for 1898, and some have been placed; but furnace-men are rather holding back, and hesitate about naming prices far ahead, until there is a little more certainty about ore and coke prices. The Connellsville people are asking \$1.75 now, and there is no doubt that \$2 coke will be the rule before long. The Southern furnaces are taking long orders freely, as they have no such doubts about the cost of their raw materials. Forge iron is in fair demand, and we hear of orders for two or three good-sized blocks of basic pig, the largest to go to Pittsburg.

The demand for steel billets is heavy, especially in the East, and some large transactions have been closed, while others are still under negotiations. The steel mills are also taking some big orders for wire rods and tin-plate bars. Here again there is some hesitation about taking orders far ahead, in view of possible higher prices.

For finished material the demand is growing, and new contracts, especially for structural steel, are plentiful. It is understood also that some good orders for plates have been placed by shipbuilders. In merchant iron and steel there is also a better demand from the shops, and the volume of small orders is growing pretty steadily.

It is now quite certain that the railroads will be heavy buyers, as their increasing earnings will enable them to make the repairs and renewals which have been postponed as long as possible. Retail orders are still coming in, while the locomotive and car builders are making inquiries for material on a larger scale than they have done for a long time. The bridge builders are also good buyers just now.

There continues to be some talk about a renewal of the rail pool, but it is not based upon anything definite, and it is doubtful whether the parties chiefly interested have considered the matter at all. The proposed wire-rod pool has been definitely agreed upon, according to some authorities; but in fact it is very far from completion—so far, indeed, that those best informed are very doubtful about its formation at all. The air is full of rumors as to other combinations, but there is merely the talk which is always to be heard in a busy season, and means nothing for the most part.

Not much is heard just now about export business. Improving demand and higher prices at

home have drawn off a great deal of the interest, and high ocean freights have also interfered. It is to be hoped that this business will not be dropped and that the time and money spent in working it up will not be lost.

NOTES OF THE WEEK.

The suits of the Harvey Steel Company against the Bethlehem Iron Company and the Carnegie Steel Company, Limited, for infringement of the Harvey armor plate patents in filling orders for armor plate from Russia, were settled in the United States Circuit Court in Philadelphia, on Tuesday, October 5th. Judge Acheson signed, with consent of counsel of both defendants, decrees against both the companies, sustaining the validity of the Harvey armor plate patent No. 460,262, and enjoining those companies from using the process or making or vending plates under that patent except under license from the Harvey Steel Company, the owners of the patent. The suit against the Bethlehem Company was begun in March, 1895, and that against the Carnegie Company in April, 1897. It is understood that both companies have taken a license from the Harvey Steel Company, acknowledging the validity of the Harvey patent and agreeing to pay royalties on armor manufactured for export. This does not affect the manufacture of armor plate for the United States Government, as the government holds a license to manufacture and use Harvey armor plates given by the Harvey Steel Company, April 12th, 1893.

New York, Oct. 8.

The local iron market continues to show an improvement; sales are active and prices have generally advanced. Numerous inquiries have been received for large lots of rails for future delivery, but up to the present writing no contracts have been closed.

The demand for pig iron continues steady; if anything there is an improvement over last week's business, both as regards price and orders.

The market for structural steel has closed with a decided improvement. Orders have been booked to the amount of 3,000 to 4,000 tons.

Pig Iron.—The market for pig iron continues steady. Sales are in a very healthy condition, and we note an advance in price for immediate delivery. Quotations are: Northern No. 1 X Foundry, \$11.75@ \$12 per ton; No. 2 X foundry, \$11.25@ \$11.50; No. 2 plain, \$10.75@ \$11, gray forge, \$10.25@ \$10.50; Southern No. 1 Foundry, \$11@ \$11.25 per ton; No. 2 foundry, \$10.50@ \$10.75; No. 1 soft, \$11@ \$11.25; No. 2 soft, \$10.75@ \$11; gray forge, \$10@ \$10.25; Basic, \$10.50@ \$10.75. All prices are for tidewater delivery.

Cast-Iron Pipe.—There is an increase over last week's sales for pipe, but prices continue low.

Spiegeleisen and Ferro-Manganese.—The market continues fair. Quotations are: Spiegeleisen, 20%, \$19@ \$19.50; ferro-manganese, 80% domestic, \$45.50@ \$46, delivered at buyer's mill.

Steel Billets and Rods.—There is an increased demand for billets, but no advance in prices. Inquiries have been received regarding 1898 delivery, but sellers hesitate about closing contracts. Quotations are \$17.50@ \$18 for billets at tidewater and \$22@ \$22.50 for rods at mill.

Merchant Iron and Steel.—The trade in merchant material is in fairly good condition with prices unchanged. Quotations are: Common bar, 1@ \$1.05c.; refined, 1.10@ \$1.15c.; soft steel bars, 1.15@ \$1.20c.; steel hoops, 1.30@ \$1.35c.; steel axles, 1.40@ \$1.60c.; tire steel, 1.05@ \$1.10c.; spring steel, 1.35@ \$1.40c.; links and pins, 1.50@ \$1.60c.; cotton ties, 65c. per bdl. at mill.

Plates.—The inquiries in this market are steadily growing in volume, and orders booked show an improved business. We quote for universal mill plates 1.17½@ \$1.20c. For steel plates prices are: Tank, 1.17½@ \$1.20c., boiler shell, 1.25@ \$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, 2.75c. for flange and 3.25c. 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.—Large orders have been booked for immediate delivery, with prices advancing. Everything points to a still further improvement. We quote for angles, 1.20@ \$1.25c.; tees, 1.25@ \$1.35c.; channels, 1.20@ \$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.—Manufacturers report no large orders closed but many inquiries. Prices remain about the same. Quotations for steel rails are \$19@ \$20 per ton for standard sections and \$23 for girder rails. Lighter rails are figured on by reliable concerns as follows: 16-lb., 20-lb., 25-lb., 30-lb. and 35-lb., \$22; 40-lb. and 45-lb., \$20 f. o. b. mill.

Tidewater quotations for rail fastenings are: Angle bars, 1.20@ \$1.25c.; spikes, 1.50@ \$1.55c.; bolts, square nuts, 1.80@ \$1.85c.; hexagon nuts, 1.90@ \$1.95c.

Wrought Iron Pipe.—Business continues very good in this branch of the iron trade and up to the present writing prices have not advanced. We expect, however, that there will be an advance very shortly and changes in discounts are now under discussion.

Nails.—The wire nail business continues good; in fact, it is very difficult to get orders executed promptly. Carload lots are quoted at \$1.45@ \$1.50 f. o. b. mill, and \$1.65 on dock at New York.

Smaller quantities from store are quoted at \$1.70. Cut nails continue firm, with the demand steady. Base quotations for carload lots are \$1.35 delivered at New York; \$1.31 at Philadelphia; \$1.35 at Boston; \$1.30 at Baltimore; \$1.33 at Albany, and \$1.27½ at Buffalo. Small lots at New York are quoted at \$1.43@1.45 from store.

Old Material.—There is a moderate demand with no change in prices. Sellers are holding back for an advance in price, and are not anxious for business just now.

Buffalo. Oct. 6.

(Special Report of Rogers, Brown & Co.)

Many of the contracts placed during the past two months were made more because the buyers considered iron at bottom rather than that their own business required further purchases. They figured out purchases as safe investments and that business would come some time. During the past week not a few of those who hesitated to obligate themselves further until their own business showed a real improvement, have been in the market and purchased quite liberally. The general activity which is so noticeable in the West is certainly working eastward slowly and many of the foundries in this vicinity are now feeling the effects of the better times. One encouraging feature noticed is that not so much attention is now given, as in the past, to saving a few cents per ton, but it seems of more importance to consumers to have contracts placed so they will be assured of the delivery of their iron when desired and of having their favorite metal furnished. Local furnaces seem to have taken on about all the business that can be comfortably handled during the next two months, although the blowing in of an additional stack at Tonawanda will tend to relieve the scarcity of some grades. Prices are very firm on the basis mentioned below, and are for cash f. o. b. cars at Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$11.25; No. 2 strong foundry coke iron, Lake Superior ore, \$10.75; Ohio strong softener No. 1, \$11.75; Ohio strong softener No. 2, \$11.25; Jackson County silvery No. 1, \$14; Southern soft No. 1, \$11.75; Southern soft No. 2, \$11.35; Niagara malleable, \$10.75.

Chicago. Oct. 6.

(From Our Special Correspondent.)

Pig Iron.—The past week has not brought with it any increased buying of pig iron; sales continue to be quite numerous, though most of them are for amounts from one carload up to a couple of hundred tons. There is but little demand at the present time for large amounts, most of the large consumers having already stocked up for this year's wants. It is, however, expected that commercial conditions will so improve as to compel the foundries in general to buy even more heavily than they have done during the past couple of months. Prices continue to be very firm, the recent additions to pig-iron prices having evidently come to stay. Quotations are: Lake Superior charcoal, \$13@13.25; local coke foundry No. 1, \$11@11.50; No. 2, \$10.75@11; No. 3, \$10.50@10.75; local Scotch foundry No. 1, \$11.50@12; No. 2, \$11@11.50; No. 3, \$10.50@11; Southern coke, No. 1, \$11@11.25; No. 2, \$10.60@10.85; No. 3, \$10.35@10.60; Southern No. 1, soft, \$11@11.25; No. 2 soft, \$10.60@10.85; Jackson County silveries, \$12.50@14.50; Ohio strong softeners, \$12@12.25; Alabama car wheel, \$16@17; Coke Bessemer, \$11.50@12.

Bar Iron.—There continues a good demand for bar iron, the railroads still being a factor in that market. Sales of the week have been quite numerous though no great tonnage was represented, most of the sales being for rather small quantities. Prices remain firm and are: Common iron, 1'10@1'20c.; guaranteed 1'20@1'30c.

Steel Rails.—Rails are now being sold only in small quantities for delivery during the rest of this year. The mills here have all they can attend to from the present time to the end of 1897. It is understood that a number of the large Western lines are now figuring on rails for delivery after the first of new year. Rails are now quoted \$20.50@22.50, Chicago.

Billets.—The mills here are receiving no large business, having enough to keep them busy for some time. Small business is coming in and is attended to as quickly as possible. Billets are quoted \$18@18.50 and rods \$25.50@26.

Structural Material.—A couple of fair-sized contracts for bridge material were let in this market during the past week. Business outside of that continues fairly good rather a heavier demand for bridge material than for building shapes. Prices remain firm and are: Beams and channels, 1'20@1'25c.; plates, 1'20@1'25c.; tees, 1'30@1'40c.; angles, 2'0@1'25c.

Cleveland. Oct. 6.

(From Our Special Correspondent.)

Iron Ore.—A very fair amount of ore has been sold during the past week. Both Bessemer and non-Bessemer ores have figured in the transactions. In some cases the sales have been at a little more money than the same grade of ores brought 10 days ago, a result of the higher lake freight rates. The rates at present are 75c. per ton from Escanaba, 60c. from Marquette and 65c. from Ashland and the head of Lake Superior. Following are the prevailing prices: Specular and magnetic ores, Bessemer quality, \$8@8.75; specular and magnetic ores, non-Bessemer quality, \$2.50@2.75; hematite ores, Bessemer quality, \$2.5@2.8; hematite ores, non-Bessemer quality, \$2@2.50.

Pig Iron.—The demand for the different kinds of metal has been good during the past week, and the sum of the transactions is satisfactory to the dealers. The market is firm, and it is said that some sales were made at a little more than the market price. The quotations follow: Lake Superior charcoal, \$13.25; Bessemer, \$10.50@10.75; No. 1 foundry, \$10.75@11; No. 2, \$10.25@10.50; No. 1 Ohio Scotch, \$11.15; No. 2, \$10.65; gray forge, \$9.75@10.

Philadelphia. Oct. 8.

(From Our Special Correspondent.)

Pig Iron.—Incoming buyers will be obliged to take brands of iron which they will not touch a few weeks ago and pay stiff prices for it. Buyers who have bought during the past month are hurrying up deliveries in some cases, as though they were afraid they will not get their iron. Our furnaces consider themselves pretty well sold up. There is no pressure to sell, and those consumers who have not as fully covered requirements as they should are living in hopes that the present apparent lull will bring them more reasonable rates. There are sales of Bessemer at \$12.50. Low phosphorus was quoted at \$16 yesterday. Basic is strong at \$10.50, though not particularly active. No. 1 X Foundry is \$12@12.50; No. 2 X \$11@11.50; No. 2 plain \$11, though sales are known of at less. Standard forge is \$10.50 and not particularly active.

Billets.—The only hope of lower prices, and it is a clear one, is that speculative holdings may be unloaded. A good deal of stock would be taken at \$18.50. Higher prices are quoted, but there is no activity worth speaking of.

Sheets.—Large consumers have extended their orders for winter delivery, and this has made something of a rush at the mills. As a result there is a firmness in prices made for quick deliveries. In fact one or two concerns have, in reply to urgent inquiries, refused to make any concessions on winter deliveries.

Bars.—An advance in merchant bars is practically determined on. It will be trifling, but encouraging. More car lots are being ordered. All mills are having a fair share of work to do. Refined, 1'5c.; special makes, 1'20@1'30c. Steel bars are 1'20c.; high grade, 1'30@1'40c.

Pipes and Tubes.—In conformity with the spirit of the recent meeting there is an upward tendency, which promptly showed itself in the withdrawal of certain concessions that have been hanging out. The entire market is a little stronger and more business is being done.

Merchant Steel.—A steady business is being done at pretty full prices.

Plate and Tank.—Our shipyard managers are considering the advisability of taking time by the forelock, and ordering enough material to see them through on a lot of ship work, which they feel is practically secured. Prices on the larger orders are rather low; in fact the anxiety for big orders and the danger of outside competition keeps our figures low. In a retail way average quotations are 1'20c. for tank and universals; flange, 1'30c.; firebox, 1'60@2'50c.

Structural Material.—Angles are 1'20c.; beams and channels, 1'25c. New business of considerable magnitude will be closed on Saturday or Monday.

Steel Rails.—The advance in steel has driven some railroad managers unexpectedly into the market, and they paid \$20 for large lots. A few more large orders are promised next week.

Old Rails.—Old iron rails have advanced and \$13.50 is asked to-day; sales at \$13. Old steel rails, \$11@11.50, with sales at inside figure.

Scrap.—Scrap is in active demand and yardmen are on the hunt for it. It is said prices are going up, but old quotations are still given. Choice railroad will bring \$13; heavy steel scrap, \$11; steel axles, \$12; old iron axles, \$14.

Pittsburg. Oct. 7.

(From Our Special Correspondent.)

The tone of the market is exceedingly strong and from present appearances the upward tendency is likely to continue. The movement in this market has been rapid, the demand having been freely met. The amount of business on the books is so large, however, that quotations are now made with more reserve, as there is a possibility of materially higher prices during 1898; and as all 1897 is practically under contract sellers generally prefer to hold off rather than increase engagements, which are already on a larger scale than for some years past. The plain fact of the matter is that prices generally take care of themselves on a rising market. Fortunately the outlook is such that there is little danger of business being taken at less than the rates adopted; the chances appear to be in the other direction, although, of course, it is still possible that the market may halt for a while after the big buying of the past four or five weeks. The advance we have previously noticed in tubes and in wrought iron and steel pipes will soon be followed by another. A meeting will be held in Pittsburg for that purpose.

Bessemer Pig.—The market is very firm; the furnaces generally are all sold up to the close of the year. Iron for Pittsburg delivery, October to January, is \$10.75@11; Valley delivery same time \$10.25@10.50 asked. The sales of Bessemer for September beat all previous records, aggregating 290,300 tons. Consumption is now in advance of production; this, however, will soon be remedied,

as several furnaces have been started within a few days, among them the Carrie at Rankin.

Other Material.—Steel billets are very firm and advancing; stock, in first hands are light; prices touched \$17, being the highest this year. For mill iron the market rules very firm, the supply being far short of the demand. Sales at \$9.75@10 and tending upward. September sales were 57,120 tons, and supply is limited. Muck bar is firm and active at \$19@19.25. For sheet bars the demand exceeds the supply. Sales are made at \$18.30@18.50. Steel wire rods show a further advance, with sales at \$24@24.50. Finished material of all kinds is firm and advancing.

Latest.—The demand for iron and steel is not so pressing as for some weeks past, still the volume of transactions was liberal. The heavy sales for September will keep the mills going for some time. Skelp steel advanced 5c.; billet ends, 50c.; muck bar, 25c.; sheet bars, 50c.; spelter, 2½c.; old iron rails, 25c. Valley Bessemer is not so firm, sales ranging \$9.90@10.10 at furnace. Pittsburg Bessemer is firm at \$10.75. Mill iron is steady at \$9.75@9.85. The outlook is a favorable one.

The demand continues very active for local and export purposes; all the plants in Pittsburg and vicinity are running to their full capacity with stocks being shipped as fast as made.

COKE SMELTED, LAKE AND NATIVE ORE.				SKELP IRON.			
Tons.	Cash.	Tons.	Cash.	Tons.	Cash.	Tons.	Cash.
10,000 Bess., O., N., D., V.	\$10.15	1,000 N. G., Pitts.	\$17¼	1,000 N. G., Pitts.	\$12.00	1,000 Sheared, Pitts.	\$13.50
10,000 Bess., N., D., Val.	10.10	1,000 W. G., Pitts.	12.25	500 W. G., Pitts.	12.00	500 N. G., Pitts.	12.00
8,000 Bess., O., N., V.	10.15						
7,500 Bess., O., N., P.	10.75	SKELP STEEL.					
5,000 Bess., Oct., P.	10.70	1,000 Sheared, Pitts.	\$12.00	1,000 W. G., Pitts.	\$10.40	800 N. G., Pitts.	\$10.40
5,000 Bess., O., N., V.	9.90						
4,000 Bess., Nov., Val.	10.00	MUCK BAR.					
4,000 Bess., Oct., V.	9.90	1,000 Neutral, Pitts.	\$10.25	1,000 Neutral, Pitts.	12.00	800 Neutral, Pitts.	12.25
3,000 Mill Ir., prompt, P.	9.70	800 Neutral, Pitts.	12.25	500 Neutral, Pitts.	12.25		
3,000 Mill Ir., Oct., P.	10.85	SHEET BARS.					
3,000 Mill Ir., Oct., P.	10.00	1,000 Delivered, Pitts.	\$13.50	800 Delivered, Pitts.	13.30	500 Delivered, Pitts.	13.50
2,000 Mill Ir., Oct., V.	9.20						
2,000 Bess., O., N., P.	10.75	BLOOMS, BILLETS, BARNDOGS.					
1,000 Bess., N., D., P.	10.75	1,000 Billet ends, P.	\$11.50				
500 Mill Ir., prompt, P.	10.75	STEEL WIRE RODS.					
500 Mill Ir., Oct., P.	10.75	1,000 Delivered, Pitts.	\$10.00	500 Delivered, Pitts.	\$10.00		
500 Bess., P.	10.80						
500 Off Bess., P.	9.30	OLD RAILS.					
300 No. 1 F., P.	11.25	1,000 S. R., L., Pitts.	\$11.50	1,000 I. R., gr., Val.	11.50	700 S. R., gr., Val.	11.50
300 Mill Ir., prompt, V.	9.25	500 I. R., gr., Pitts.	11.25	500 I. R., gr., Val.	11.50	500 S. R., gr., Pitts.	11.25
100 White Ir., P.	8.70	500 S. R., gr., Pitts.	11.25	250 I. R., gr., Val.	11.25		
50 No. 2 F., P.	10.50	SCRAP MATERIAL.					
		500 C. W., gr., Pitts.	\$10.00	500 No. 1 W. S., net, P.	\$13.50	500 No. 1 C. S., gr., P.	\$12.50
		250 W. T., net, Val.	11.00	200 C. B., net, Val.	12.00		

METAL MARKET.

NEW YORK, Friday Evening, October 8, 1897.
Gold and Silver.

Price of Silver per Ounce Troy.

October.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	October.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
2	4.84½	95¼	56½	.437	6	4.81½	25½	55½	.430
4	4.84½	95¼	55¾	.431	7	4.81½	26	56	.433
5	4.84½	25½	55	.425	8	4.84½	27	56	.440

Under limited offerings, and a demand for spot silver, partly on speculative account, the London price of silver has been advanced until to-day business was done at 27d. The market closes weaker and no bids are being made.

The United States Assay Office in New York reports the total receipts of silver at 150,000 oz. for the week.

Gold and Silver Exports and Imports

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

	Coin and bullion.		In ore.		Total exports, Imports.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
Aug.	\$1,983,588	\$4,374,175	\$344,125	\$2,764,712	
1897..	32,446,711	8,783,320	\$95,948	3,102,063	\$39,376,052
1896..	56,813,796	30,729,726	81,686	1,172,411	\$87,637,619
SILV.					
Aug.	5,313,277	1,491,752	1,563,457	2,238,000	
1897..	37,913,151	6,924,633	250,330	13,871,960	\$45,159,174
1896..	40,940,931	7,712,939	395,962	12,003,963	\$51,053,873

This statement includes the exports and imports at all United States ports, the figures being fur-

published by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York. For the week ending October 8th, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

Table with columns: Period, Gold (Exports, Imports), Silver (Exports, Imports), Total Excess, Exp. or Imp.

The gold exported for the week went to the West Indies; the silver principally to London. Of the gold imported, \$1,000,000 came from France; \$973,000 from Germany, \$300,000 from Italy, and the remainder from Central and South America; the silver came chiefly from the West Indies, Central and South America.

Average Monthly Prices of Silver

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

Table with columns: Month, 1897, 1896, 1895 (London, New York prices).

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.

FINANCIAL NOTES OF THE WEEK.

The fluctuations in the stock market have had little apparent effect on the condition of general business, which continues to show symptoms of improvement. The main point of interest at present is the movement of the crops, which still causes a steady demand for money from the interior, drawing heavily on the New York banks.

Up to the present writing a total of \$4,550,000 in gold is reported taken in London this week for shipment to New York, and more is coming next week. There seems to be a general belief that a heavy gold import movement has begun which may continue for some time.

With regard to exports, it must be remembered that for two years past business has been very active all over Europe, while it has been dull here. Now the conditions are likely to be reversed.

At the annual meeting of the New York Clearing House Association this week the following officers were elected: President, J. Edward Simmons, president Fourth National Bank; secretary, Stuart G. Nelson, vice-president Seaboard National Bank; manager, William Sherer; assistant manager, William J. Gilpin.

The association is now composed of 46 National banks and 19 State banks. The Assistant Treasurer of the United States at New York also makes his exchanges at the Clearing House.

A London dispatch to-day says that it is announced that Great Britain's answer to the bimetallic proposals will be delayed. Arrangements have now been made to hold informal conferences between the Chancellor of the Exchequer, Sir Michael Hicks-Beach, and other British officials on one side, and the United States Monetary Commissioners and Col. John Hay, the United States Ambassador, on the other side, for the purpose of securing a more definite understanding as to what the United States and France expect.

The usual monthly estimate of the money in the United States is given out by the Treasury Department, as below, on October 1st:

Table with columns: In circulation, In Treasury, Totals. Items include Gold coin, Stan. silver dollars, Subsidiary silver, Gold certificates, Silver certificates, Treas. notes 1890, U. S. notes, Currency, Nat. bank notes.

This is a net increase of \$13,160,440 in circulation during September, and of \$96,538,249 as compared with October 1st, 1896. The estimated amount of circulation per capita is now \$22.89.

The coinage executed at the Mints of the United States during September and the nine months of 1897 is reported by the Treasury Department as follows:

Table with columns: Denominations, September (Pieces, Value), Nine months (Pieces, Value). Items include Gold, Silver, Minor.

The coinage in September was heavier than in August by \$448,753 50.

The statement of the United States Treasury, on Thursday, October 7th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

Table with columns: Sept. 30, Oct. 7, Changes. Items include Gold, Silver, Legal tenders, Treasury notes, etc.

Treasury deposits with national banks amounted to \$17,823,447, an increase of \$431,169 during the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending October 2d gives the following totals, comparison being made with the corresponding weeks in 1896 and 1895:

Table with columns: 1896, 1895, 1897. Items include Loans and discounts, Deposits, Circulation, Reserve (Specie, Legal tenders), Total reserve, Legal requirement, Surplus reserve.

Changes for the week, this year, were increases of \$321,000 in circulation and \$404,500 in specie; decreases of \$4,592,000 in loans and discounts, \$7,002,800 in deposits, \$2,442,300 in legal tenders, and \$447,100 in surplus reserve.

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

Table with columns: Banks, 1896 (Gold, Silver), 1897 (Gold, Silver). Items include N. Y. Asso., England, France, Germany, Austro-Hun., Netherlands, Belgium, Spain, Italy, Russia.

The returns for the Associated Banks of New York and the banks of Germany, Austro-Hungary and Belgium are of date October 2d; the Bank of Italy, August 31st; the Bank of Russia, August 16-28th; the Banks of Spain and the Netherlands, September 18th; the others are of date October 7th.

Shipments of silver from London to the East for the year up to September 23d are reported by Messrs. Pixley & Abell's circular as below:

Table with columns: 1896, 1897, Changes. Items include India, China, The Straits, Totals.

Arrivals for the week this year were £164,000 in bar silver from New York, and £32,000 from Chile; a total of £196,000. Shipments for the week were £203,120 in bar silver to India.

Indian exchange has been unsettled and somewhat lower, commercial bills having sold at 15.60@15.75d. per rupee. The sales of silver for India are still reported large.

Prices of Foreign Coins.

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

Table with columns: Bid, Asked. Items include Mexican dollars, Peruvian soles and Chilean pesos, Victoria sovereigns, Twenty francs, Spanish 25 pesetas.

Other Metals.

Copper.—The week has been devoid of any excitement, and transactions were rather limited. Manufacturers having bought quite freely during the last few weeks, did not show much inclination to take in further quantities, and producers being very firm and independent hardly any business has resulted.

The foreign market has eased off to some extent. G. M. B.'s which at the beginning of the week were quoted £49 5s, declined from day to day, reaching the lowest level today, viz: £48 12s. 6d. @ £48 15s. for spot and £48 17s. 6d. @ £49 for three months prompt.

Tin.—The heavy arrivals which made port during the last 10 days have somewhat depressed prices, and sales have been made for spot and October at 13.70@13.80c.; futures at 13.75@13.85c.

The London market has been firm, and prices close a little better than last week, viz: £62 5s. @ £62 7s.

Imports and Exports of Metals.

Table with columns: Port, Week, Sept. 30 (Expts, Impts), Year, 1897 (Expts, Impts). Items include New York (Aluminum, Antimony, Brass, Copper, Ferro-chrome, Iron, Lead, Manganese, Nickel, Rails, Steel, Tin, Zinc), Baltimore (Brass scrap, Chrome, Copper, Ferro-manganese, Iron, Lead, Manganese, Rails, Steel, Tin, Zinc), Philadelphia (Antimony, Chrome, Copper, Ferro-manganese, Iron, Lead, Manganese, Tin).

*New York Metal Exchange returns. †From our Special Correspondent. ‡Week ending Sept. 30. §Week ending Oct. 7.

6d. for spot, and £62 15s. @ £62 17s. 6d. for three months prompt. Statistics for the month of September have decreased 400 tons.

The visible supply of tin on October 1st is reported as follows, in long tons:

	In store.	Afloat.	Totals.
London.....	16,501	2,810	19,311
Holland.....	5,689	925	6,614
U. S., excl. Pacific ports.....	3,415	2,535	5,950
Totals.....	25,605	6,270	31,875

This compares with 31,906 tons on September 1st, and 35,417 tons on October 1st, 1896.

Lead.—Prices show quite a decline from those of last week, as several refiners have been pressing on the market, while consumers have been holding off. These cheaper lots being now more or less out of the way, there is at the close a somewhat steadier feeling, but we have to reduce the quotation to 4'20c. New York, while business has been done in St. Louis at 4'5c. for refined and 4c. for common.

In London, Spanish lead is quoted at £13 11s. 3d. @ £13 12s. 6d. and English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is dull and lower. Common is obtainable at 4'02½c., and some sales have been made at 4c. Corroding, refined, is worth 4'05 @ 4'07½c.

Spelter.—The market is again rather irregular, and if anything prices are also a trifle lower. We have to quote for prime Western 4'17½ @ 4'20c., New York.

The London market is reported dull at £17. 17s. 6d. for ordinaries and £18 for specials.

Antimony.—There is no change, and we quote 7½ @ 8c. for Cookson's; 7½ @ 7¾c. for Hallett's; 7½c. for Japanese and 7½c. for U. S. Star.

Nickel.—There has been more business, but no change in prices can be reported. We quote for ton lots 33½ @ 36c. per lb., and for smaller orders 35½ @ 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 price continues at \$37.50 per flask. The London price is £6 15s., with £6 13s. 6d. quoted from second hands.

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

Aluminum:	Bismuth, 2 lb.	\$1.50 @ \$1.80
No. 1, 98% ingots, 2 lb. 37 @ 42c.	Phosphorus, 2 lb.	50 @ 55c.
No. 2, 94% " " 31 @ 34c.	Tungsten, 2 lb.	70c.
Ingots, scrap, " " 30c.	Tungstic acid,	45c.
Rolled sheets, " 46c. 30c.	Ferro-tungsten, 60% ..	60c.
Alum.—Nickel, " 35 @ 40c.		

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

Average Monthly Price 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 26	3 03	4 21	3 98
June....	11 11	11 67	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 ..	11 16	10 98	13 89	13 49	3 84	2 73	4 26	3 76
Sept....	11 30	10 66	13 98	13 15	4 30	2 77	4 18	3 60
October ..	.....	10 66	.....	12 94	.....	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 450.)

New York. Oct. 8.

Heavy Chemicals.—Business is merely of a routine nature; deliveries are principally on old contracts. Alkali is being moved in fairly large quantities, as is also bleaching powder. Caustic soda is inquired for rather moderately, while foreign sal soda is somewhat scarce. The imports of heavy chemicals last week included \$717 worth of soda ash; \$185, caustic soda; \$1,034, alkali; \$6,873, chloride of potash; \$236, bicarbonate of potash; and \$9,018 worth of bleaching powder. Our quotations show little change this week, although some of the articles can be purchased at slightly lower figures: Caustic soda, 60%, \$2.10 @ \$2.20 per 100 lbs. Alkali, domestic, 58%, 65 @ 67½c. for 50-ton lots and over, and 70 @ 80c. for smaller quantities; 48%, \$1 @ \$1.20 for jobbing lots. Foreign, 72½ @ 77½c. Carbonated soda ash, 90 @ 95c. per 100 lbs., for 58% basis of 48%. Bleaching powder prime brands, \$1.85 @ \$2.00; Continental F brand, \$1.85 @ \$1.90;

other brands, \$1.70 @ \$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, 75 @ 80c. per 100 lbs.; American, 65 @ 70c. per 100 lbs. Chlorate of potash, \$9.37½ @ \$9.75 per 100 lbs.

Acids.—There has been a good demand this week for acids, and in some quarters the orders exceed the supplies on hand. Sulphuric continues to show an increased inquiry. Acetic acid is somewhat unsettled owing to talk of a combination or trust in acetate of lime, in which case higher prices are expected to rule in 1898. Prices of the other acids are firm, though unchanged. Imports last week amounted to \$3,346; of this total \$3,077 was for carbolic acid, and \$2,084 for picric acid. Quotations 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 bibbls., \$1.70 @ \$1.80; in carboys, \$1.90 @ \$2.05. Muriatic acid, 18°, 75 @ 85c.; 20°, 85 @ 95c.; \$1.15 @ \$1.25, according to make and quantity. Nitric acid, 36°, \$3.50 @ \$4; 40°, \$4 @ \$4.50; 42°, \$4.50 @ \$5.50. Oxalic acid, 7 ex-dock and \$7.25 ex-store. Mixed acids, according to mixture. Sulphuric acid, 68°, 70 @ 85c. in carload lots, 10 @ 15c. higher for small quantities. Chamber acid, 50°, \$8 @ \$6.50 per ton at factory. Blue vitriol, \$3.62½ @ \$3.75, according to grade and order.

Brimstone.—Consumers are still taking supplies in a hand-to-mouth way; hence the market is quiet. Prices are unchanged at \$21 @ \$21.25 for best un-mixed seconds, and \$1 less for thirds.

Fertilizing Chemicals.—The demand generally is quiet. Sulphate of ammonia has been inquired for in a jobbing way, while a few round lots of dried blood were sold. Supplies of leading ammoniates were moderate during the week; this tended to strengthen prices somewhat. Potash salts are being inquired for by the customary consumers at this season. New business, however, is limited, and contracts are not very large. We imported at this port \$5,463 worth of ammonia last week, of which \$4,627 was for sulphate of ammonia and \$836 for muriate of ammonia. Quotations are as follows:

Sulphate of ammonia, gas liquor, \$2.20 @ \$2.25; bone, \$2.15 @ 2.20 per 100 lbs. Dried blood, high grade Western, \$1.90 @ \$1.95 per unit New York; \$1.95 @ \$2 per unit f. o. b. Chicago. Azotine, \$1.65 @ \$1.70 basis New York. Concentrated phosphate (30% available phosphoric acid), 57½c. per unit. Acid phosphate, 13 @ 15%, av. P₂O₅, 54 @ 65c. per unit at sellers' works in bulk. Dissolved bone black, 17 @ 18% P₂O₅, \$16 @ \$16.50 per ton. Acidulated fish scrap, \$9.50 @ \$10, and dried scrap \$18 @ \$18.50 f. o. b. fish factory. Tankage, high grade, \$16.25 @ \$16.50 per ton, f. o. b. Chicago; concentrated tankage, \$1.55 per unit, f. o. b. Chicago; New York, \$21; low grade, \$13 @ \$13.50. Bone tankage, \$19 @ \$20; ground bone, \$21 @ \$23. Bonemeal, \$19.50 @ \$22.50.

Sulphate of Potash: 90%, New York and Boston, \$1.99½; Philadelphia, Baltimore and Norfolk, \$2.01; Southern ports, \$2.03.

Double Manure-Salt: Quotations for 48 @ 49%, less than 2½c. 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, 1'06½ @ 2'00½c. to arrive; basis of 90%. In bulk 24 @ 36%, 30½ @ 37½c. per unit phosphate acid.

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 12¼% actual potash, equivalent to 23% sulphate of potash, \$8.80 @ \$8.90.

Nitrate of Soda.—This market is featureless, and prices remain unchanged at \$1.65 @ \$1.67½ per 100 lbs.

Messrs. Mortimer & Wisner's monthly statement, dated October 1st, gives the following information with regard to nitrate:

	1897.	1896.	1895.
	Bags.	Bags.	Bags.
Imported into Atlantic ports from West Coast S. A., from Jan. 1....	420,895	680,574	610,265
Stock in store and afloat Oct. 1, in New York....	79,888	146,517	73,283
Boston.....	.....	.....	1,900
Philadelphia.....	2,032	8,827	400
Baltimore.....	.....	1,500	1,000
Norfolk, Va.....	.....	.....	351
Charleston.....	.....	.....	.....
To arrive, due Jan. 15....	174,000	146,500	230,000
Vis. supply to Jan. 15....	255,920	303,314	306,943
Stock on hand Jan. 1.....	123,553	53,839	58,367
Deliveries past month....	58,461	55,863	72,215
Deliv. since Jan. 1.....	462,538	577,569	591,689
Total yearly deliveries....	.....	746,264	828,042
Prices current Oct. 1.....	1'65c.	1'72½ @ 1'75	1'80 @ 1'835

NOTES OF THE WEEK.

The shipments of high grade Florida phosphate rock through the port of Savannah, Ga., during the

month of September, 1897, are reported by J. M. Lang & Company, at 17,188 tons; all to foreign ports.

Fertilizers to the amount of \$430,386 were exported from the United States in August, 1897, which amount compares with \$397,039 in the corresponding period last year.

The imports into the United States in the month of August, 1897, included the following: Soda, \$519,823, against \$216,185 in 1896; sulphur, \$235,350, against \$98,405 in 1896; potash, \$214,339, against \$175,094 in 1896; chloride of lime, \$83,087, against \$96,973 in 1896; asphaltum, \$49,511, against \$43,339 in 1896, and cement, \$256,139, against \$354,275 in 1896.

Liverpool. Sept. 29.

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

There is a steady market for heavy chemicals and a fair all round trade is reported. Soda ash is in moderate supply, and for some markets makers are declining orders, having little to sell for the balance of this year. We quote spot range for tierces as to market 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 price for tierces. Special quotations for American business. Soda crystals continue in good demand; the price for barrels ranges from £2 7s. 6d. to £2 17s. 6d. per ton, less 5% as to market, and 7s. less for bags. For export to United States special quotations are given.

Caustic soda is in demand and prices are well maintained. We quote spot range as to destination as follows: 60%, £6 5s. @ £6 10s.; 70%, £7 5s. @ £7 10s.; 74%, £8 5s. @ £8 10s.; 76%, £8 15s. @ £9 per ton, net cash. Bleaching powder is steady at £8 12s. 6d. @ £8 17s. 6d. per ton, net cash, for hardwood packages, as to destination. Chlorate of potash is quoted at 3½d. per lb. for any position, while there are a fair number of inquiries on the market, although little actual trade is reported. Bicarb. soda is in fair request and is still quoted at 4½ 15s. per ton, less 2½% for the finest quality in l-wt. kegs, with usual allowances for larger packages. Sulphate of ammonia is still scarce and for early delivery £8 8s. 9d. @ £8 11s. 3d. per ton, less 2½%, is about nearest range for good gray, 24 @ 25%, in double bags, f. o. b. here as to quality.

Nitrate of soda is quiet, and nearest spot value is about £7 15s. @ £7 17s. 6d. per ton, less 2½% for double bags f. o. b. here, according to quality and quantity.

Carb. ammonia, lump, 2½d. @ 3d. per pound; powdered, 3d. @ 3½d. per pound, less 2½%.

MINING STOCKS.

Complete quotations will be found on pages 446, 447 and 448 of mining stocks listed and dealt in at:

Aspen.....	Helena.....	London.....
Baltimore.....	Los Angeles.....	Mexico.....
Boston.....	New York.....	Paris.....
Cleveland.....	Philadelphia.....	Rossland.....
Colo. Springs.....	Pittsburg.....	Shanghai.....
Denver.....	Salt Lake.....	Valparaiso.....
	San Francisco.....	

New York. Oct. 8.

Business is still quiet in this section for mining stocks. Of the Comstocks, Consolidated California & Virginia rose 20c. to \$1.70, and ruled steady at this figure; Mexican sold at 63c., which is an advance of 8c. over last week. Potosi on the other hand receded 25c. to 45c., while Savage moved up 20c. to 55c. Sierra Nevada opened at \$1.25, rose to \$1.30, at which it remained steady; an advance of 15c. from the opening quotation last week. Belcher has risen to \$1.30 this week, which is a gain of 90c. since two weeks ago. Best & Belcher sold at 85c. on Tuesday, which is 5c. more than two weeks ago. Yellow Jacket continues to rise, and this week it sold at 75c., which is an increase of 35c. from last week, and is the highest price at which the stock has sold for many months. This is due to the rumors that have been circulated of rich finds on Gold Hill.

The Comstock Tunnel Company will hold its annual meeting on Monday in New York City. We understand that Mr. Franklin Leonard, Jr., the former president, and who is now superintendent, is desirous of again assuming the position from which he resigned 12 months ago. The matter will in all probability be decided at the annual meeting.

The California stocks are featureless. Standard Consolidated sold at \$1.80, and as the stock will be ex-dividend shortly it is expected to go lower.

There is a little more doing in the Colorado stocks, and some of the dividend-paying shares are realizing rather high prices.

The Lower California stock, Fortuna, is still attracting attention on the Consolidated Exchange, and this week opened at \$11, gradually rising to \$12.60, but receding again to \$11.13. The South Dakota stock, Homestake, sold at \$37.25, which is 25c. more than last week.

The Yukon stock, dealt in on the Mining Exchange, sold at 22½ @ 26½c. this week.

The Mining Exchange held its annual meeting on October 5th, at which the following candidates were chosen unanimously: President, William C. Dornin; vice-president, George A. Drake; treasurer, John G. Dale; secretary, George D. Hedian. W. G. Hillman was elected a member, and W. L. S. Jackson

was proposed, while Henry B. McDowell accepted the transfer of membership of B. B. Ward.

Boston. Oct. 7.
(From Our Special Correspondent.)

The market this week has been rather dull, and the tendency has been to lower prices. The specialties which have been prominent of late have ruled lower on efforts to realize profits. Butte & Boston, which was very strong in the early part of the week, selling up to \$29½, was attacked yesterday and sold off to \$26. To-day it rallied and was up again to \$27½. Centennial was also heavy on realizing sales, and after selling at \$21 declined to \$17, recovering in part to \$18 and closing at \$17½. Ocoela, while not very active, was quite steady with sales at \$41 and later at \$39. Kearsarge was also dull at \$21½ down to \$20, closing ½ higher. Franklin declined from \$22½ to \$19½, with latest sale at \$21. Old Dominion advanced from \$25 to \$26½, and later declined to \$23, with closing sale at \$23½. Atlantic declined to \$24½ and rallied to \$25½, closing at \$25. Wolverine declined from \$17½ to \$16 and closed at \$16½. Allouez was off to \$11½ and Arnold to \$3½ on moderate dealings. Tecumseh declined from \$3½ to \$3. Tamarack, Jr., was steady at \$16½@17 Boston & Montana touched \$147½, after selling at \$142½; later declined to \$143 and recovered to-day to \$144. Calumet & Hecla lost \$10, declining to \$465. A sale of Lake Superior iron was made at \$21. Quincy and Tamarack were both heavy; the former sold at \$115 and the latter at \$135.

In gold stocks there were very light transactions. Gold Coins sold off on the reduction of the dividend to \$1¼, with recovery later to \$2¼. Pioneer touched \$5½, but rallied to \$6½. Santa Ysabel was steady at \$15 and Merced at \$8½@8. Napa Quicksilver sold at \$7 and New Idria at the same price.

P. M.—At the afternoon board Centennial advanced to \$18½; Old Dominion to \$24½; Kearsarge to \$21 and Gold Coins to \$2¼. Butte & Boston declined to \$27.

Cleveland. Oct. 6.
(From Our Special Correspondent.)

The market has been quiet during the past week and, so far as could be learned, no change has been reported in the quotations. The brokers of the city report that the prospects for placing stock will be better within a few weeks, and they are hopeful that much business in that line will be transacted in the near future, or as soon as the mines close down for the winter.

Denver, Colo. Oct. 4.

The Colorado Mining Stock Exchange has gone out of existence, and in its stead the Denver Stock Exchange and Board of Brokers' Association was recently incorporated with the following directors for the first year: R. C. Bogy, L. C. De Morse, A. C. Foster, T. C. Delaney, H. E. Insley, Dennis Le Duc, Calvin Pullock, George M. Mitchell, Robert H. Buck, S. P. Beall, Charles Hull, D. N. Bash and J. M. Downing. It was decided some time ago to reorganize the exchange. The lists for the new board will be entirely new, stocks being put on as a demand for them appears.

Salt Lake City. Oct. 2.
(From Our Special Correspondent.)

During September call transactions were 8,850 shares, a meager record. Sales off the exchange probably foot up 250,000 shares or over, and the chief purpose served by the call is to afford an index of the market—often a very unsatisfactory one. From all that can be gleaned, fully 80,000 shares of Geyser-Marion changed hands.

The month closed with a rather discouraging outlook. Prices were being fairly well maintained and transactions somewhat increasing when silver took its downward header on September 29th to 53½c., which caused a general tumble. The same day Bullion-Buck directors met and decided to stop production from October 1st till silver rules above 60c., which aided the downward trend. Next to Silver King this is the State's largest producer, and as all prior assurances were of the output being maintained at least so long as silver is above 50c., it was a harder blow than the market could withstand. Silver stocks held as collateral for loans are less in favor, and additional securities are being called for.

In the golds the decline of Geyser-Marion, immediately following the directorate reorganization and the paying of a \$9,000 dividend yesterday, is a bad omen. President Dern has just returned from a visit to the mine and states the ore faces promise a continued handsome yield. The lower vein just opened is as well defined as the upper, carries good values and is supplying 50 tons a day to the Marion mill. It could, from the present small development, easily furnish 100 tons a day. The Geyser mill is treating 100 tons from the old workings. In spite of this authoritative encouraging assurance, a report is current that dividends are not to be counted on, and shares are lower, with numerous offerings. At the meeting of the board to-day G. R. Bothwell, one of the large original Geyser owners, resigned, and S. B. Milner filed his resignation as treasurer-manager. J. H. Hedges succeeds Mr. Bothwell. It is an open secret that nearly their entire holdings—a strange procedure in view of their representations in the recent past.

Northern Light is recovering from the bear attack. The prevailing opinion is that it will show further strength. Mercur is a shade lower. People

will talk, and street gossip is to the effect that the Mercur control in Geyser-Marion will exert an influence on the former. Sacramento, Sunshine and Little Pittsburg are unchanged.

As foretold last week, Swansea is to pay a \$5,000 dividend on October 9th. The silver decline may prevent South Swansea from declaring an October dividend. Four Aces has shipped another car of ore and there is a demand for the stock. Homestake has resumed work and its friends are hopeful of a favorable outcome. In other Tintic shares there is nothing to report, save that several are lower, as above outlined.

Starting construction on the Dexter 40-stamp mill and electric power plant occasioned inquiry for the stock, but quotations do not advance. Silver King continues to gain. The October dividend will be paid as usual. Ontario, Daly and Daly West are featureless, or lower; while the remainder on the usual trading list are quiet and occasion no comment.

San Francisco. Oct. 2.
(From Our Special Correspondent.)

Some liveliness was imparted to the market early in the week by a demand for the Gold Hill stocks, said to be on buying orders from Virginia City. This strengthened prices materially, and it was sufficient to take up about all the floating stock on the market. The weekly letters did not show any special reason for the demand.

After the buying orders had been filled there was a slight break in prices, but later this downward movement seemed to lose its force, and there was a general improvement. An impetus was given to this by the reported discovery of some rich ore in the Crown Point. The week closed with a fair amount of business doing, and with prices generally a shade below the opening range.

Some quotations noted on the Comstock shares are: Alpha, 16@19c.; Alta, 8c.; Andes, 16@17c.; Belcher, 65@63c.; Benton, 95c.; Best & Belcher, 66c.; Bullion, 10c.; Caledonia, 51c.; Challenge Consolidated, 50c.; Chollar, 43c.; Consolidated California & Virginia, \$1.40@1.45; Confidence, \$1.05; Consolidated Imperial, 3c.; Consolidated New York, 4c.; Crown Point, 70@69c.; Exchequer, 5@7c.; Gould & Curry, 58c.; Hale & Norcross, \$1.25; Julia, 2@4c.; Justice, 32c.; Kentuck, 9@10c.; Lady Washington, 4@6c.; Mexican, 4@8c.; Occidental Consolidated, \$2.65@2.70; Ophir, \$1@99c.; Overman, 22c.; Potosi, 33c.; Savage, 30c.; Segregated Belcher, 14@13c.; Scorpion, 4c.; Sierra Nevada, \$1.10@1.15; Silver Hill, 4c.; St. Louis, 18c.; Union Consolidated, 52c.; Utah, 23c.; Yellow Jacket, 38c. Standard Consolidated was quoted at \$1.80 bid and \$1.90 asked.

The sales on regular call at the San Francisco Stock Exchange for the first nine months of the year were as follows:

	1896.	1897.
January, shares.....	296,415	274,280
February.....	183,790	166,095
March.....	246,105	188,745
April.....	264,735	231,765
May.....	818,610	189,395
June.....	479,135	190,600
July.....	321,590	211,450
August.....	210,610	292,500
September.....	193,125	490,185
Total.....	2,014,125	2,243,715

The sales in September were the largest since May, 1896. The market was rendered quite attractive by the frequent fluctuations in values and the number of different shares thrown upon the Board. Sales outside of the regular session, not included in the above total, were also large.

The annual meeting of the San Francisco Stock and Bond Exchange will be held on October 11th.

The Pennsylvania Mining Company of Grass Valley has declared dividend No. 10 of 5c. per share.

The Morning Star Gravel Mining Company of Iowa Hill, Placer County, has declared its eighty-second dividend at the rate of \$8 per share.

The Consolidated Imperial Mining Company has levied an assessment of 1c. per share.

The Bellefontaine Mining Company of Nevada county has levied an assessment of 1c. per share, delinquent October 25th.

The delinquency in office of the Grayson assessment of 10c. on Hale & Norcross stock has been postponed to October 28th, and the day of sale to November 18th.

London. Sept. 29.
(From our Special Correspondent.)

The South African market has not been so dull and featureless for many months. There is practically a standstill in business, chiefly because the leading inspirers of movements are away shooting, or on the Continent, but also partly on account of the continued postponement of the mining reforms in the Transvaal. Many rumors have as usual been circulated, but with very little effect. For instance, it was announced that President Kruger is mortally ill; then that he proposed to tax the profits of the mining companies; and afterwards that the question of the reforms and concessions was hung up indefinitely. The second rumor was not a very grand invention, as it was the subject of a genuine proposal some time ago. The last mentioned one, however, appears to have a good deal of truth in it. Considering that the Parliamentary Commission on the Jameson raid came to no practical end, it need not be wondered that the Mining Commission in the Transvaal should also prove fruitless. There appears to be no real wish among the authorities of the Transvaal that the Commission's recommendations should be adopted.

In the absence of interest in South African mines, much more has been done among West Australian. Indians have also been strong. But by far the most important feature of the market has been the boom in Australasian copper properties. The North Mount Lyell Copper Company was advertised this week and is a reconstruction of a company of the same name, the object of reconstructing having been to raise additional capital to work the very large amount of ore said to be in sight. The prospectus was, as usual, unsatisfactory, as it gave the assays of dressed ore and not of the average of the ore mined. Another company that is being brought forward at present is the Lake George Mines, Limited, which was formed a year ago by the Exploration Company to take over the property of the Lake George United Mining and Smelting Company, operating under local laws in New South Wales. The property is situated 200 miles southwest of Sydney, and is near the Bugendore railway station. Mr. Schlapp estimates the average contents of copper, silver and gold at 35s. to 40s. per ton and the cost of extracting at 28s. or 29s. The smelter started at the end of June and up to the second week of August had treated 6,780 tons of ore. The matte produced assayed 25% copper, 74 oz. silver and 14 dwts gold.

Paris. Sept. 26.
(From Our Special Correspondent.)

There has been no marked change in the mining stock market during the week. The South African gold stocks have been especially dull and heavy, and have been neglected by buyers. We hear so many reports as to the proposed mining reforms in the Transvaal that they have ceased to interest.

The copper shares are somewhat lower; the metal appears to be losing ground, though it still seems doubtful whether there will not be an under-supply if your factories continue active. Here, however, there is a feeling that we have seen the best of our business revival, and that we are approaching a period of decline.

Nickel shares have had another sharp rise, the basis of which seems to be a report that a syndicate has secured control of the Sudbury mines and would put up the metal to higher prices. If this is the case—which does not yet seem clear—the benefit to our company will be considerable, but it seems too remote to justify the present rise in the stock.

In other quarters there is little change, but the market is generally quite strong.

Political matters are quiet for the present, and do not seriously affect the stock exchanges. AZOTE.

Rossland, B. C. Sept. 29.
(From Our Special Correspondent.)

A marked improvement must be noted this week, caused by the incoming of numerous inquiries and the very favorable weather, which has greatly stimulated travel. Rumors are current of several large deals, the sale of the Le Roi to an English syndicate being again reported, though the rumor needs confirmation. The attitude of English capitalists toward this camp and the tributary mineral territory continues very favorable, with a tendency toward a considerable number of investments and some important deals before the winter season is entered upon. Of these the leading brokers speak confidently, and they report in addition some activity in the sale of stocks, a slight increase in the quotation of the shares of good properties. The out-turn of this camp has now reached well up to 62,000 tons, the weekly production now averaging about 1,700 tons.

MEETINGS.

Cactus Mining Company, of Utah, has postponed the meeting which was to have been held September 11th to October 30th.

Chemung Mining Company, annual meeting, at the office, Hypotheek Bank Building, Spokane, Wash., on October 12th, at 10 a. m.

Montana Ore Purchasing Company, special meeting, at the office in Silver Bow Block, Butte, Montana, November 6th, to vote on the question of increasing the capital stock from 40,000 to 100,000 shares of \$25 par value.

LATE NEWS.

MR. ROBERT W. HUNT, of Chicago, sailed for Europe on October 2d, and expects to make a long visit abroad.

The stockholders of the Humboldt Copper Company, of Michigan, have received notice of an assessment of 50c. per share, payable October 18th. The money is to be used to resume mining operations on the property.

BY TELEGRAPH.
(From Our Special Correspondent.)

LEADVILLE, Colo., October 7th.—The Mab shaft sent down from the surface to catch the Mahala ore chute struck ore at noon to-day, and went through 3 ft. of ore during the afternoon. The Mab lies 300 ft. from the Mahala ground, and the strike was made at a depth of 970 ft. This strike is very important, as it proves that the ore chute of Carbonate Hill at second contact is yet to be developed.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Alice, Anaconda, and others with columns for location, par value, and dates from Oct. 2 to Oct. 8.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Alamo, Alice, Anaconda, and others with columns for location, par value, and dates from Oct. 1 to Oct. 7.

Official quotations Boston Stock Exchange. Bid and ask quotations. Total sales, 91,389.

BALTIMORE, MD.

Week ending Oct. 7.

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

Official quotations Baltimore Stock Exchange.

CLEVELAND O.

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

From our special correspondent.

ASPEN, COLO.

Sept. 24.

Table of stock quotations for Aspen, Colo., listing companies like Agnes C, Alta Argent, and others 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, and others with columns for par value, bid, and ask.

Official quotations Colo. Springs Mining Stock Association. Total shares sold, listed, 454,316; unlisted, 358,400.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stocks, listing companies like American Coal, Col. Fuel & I., and others with columns for par value and dates.

Official quotations. New York Stock Exchange, mining, 835 shares; other stocks, 46,273 shares; Consolidated Stock and Petroleum Exchange, mining, 17,720 shares; Mining Exchange, 437,100 shares. Total shares sold, 501,828. Bid and ask quotations.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, Pa., listing companies like Cambria Iron, Choc. & Gf. Clks, and others with columns for location, par value, bid, and ask.

Official quotations Philadelphia Stock Exchange. Bid and ask quotations. Ex-div. Total sales, 9,472.

PITTSBURG, PA.

Oct. 6.

Table of stock quotations for Pittsburgh, Pa., listing companies like Allegheny, Carborundum, and others with columns for location, par value, bid, and ask.

Official quotations Pittsburgh Stock Exchange.

STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colorado, listing companies like Acadia, Ad. le C., Aina, Agate, Alamo, Anacoda, etc., with columns for Par. val., Sept. 27, Sept. 28, Sept. 29, Sept. 30, Oct. 1, Oct. 2, and Sales.

LOS ANGELES, CAL.

Table of stock quotations for Los Angeles, California, listing companies like Amador, Arrow Lake, C.V. & M. Co., etc., with columns for Location, Par. val., Sept. 18, Sept. 21, Sept. 22, Sept. 23, Sept. 24, and Sales.

Official quotations, Los Angeles Mining and Stock Exchange. Bid and ask quotations. Total sales, 226,000 shares.

SALT LAKE CITY, UTAH.

Week ending Oct. 2.

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Alamo, Anchor, Annie, Bogan, etc., with columns for Stocks, No. of shares, Par. val., Bid., Asked., and Selling price.

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

ROSSLAND, BRITISH COLUMBIA.

Sept. 29.

Table of stock quotations for Rossland, British Columbia, listing companies like Abe Lincoln, Alberta, Big Three, Blue Bird, etc., with columns for Name of Company, No. of shares, Par. value, Selling price, and Last dividend.

From Our Special Correspondent.

HELENA MONT.

Week ending Sept. 30.

Table of stock quotations for Helena, Montana, listing companies like Am. Dev. & M. Co., Bald Butte, BeMetallic, etc., with 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, 5,350.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, California, listing companies like Alpha Con., Alta, Andes, Belcher, Best & Belcher, Bullion, etc., with columns for Name of Company, Location, Par. value, Oct. 1, Oct. 2, Oct. 4, Oct. 5, Oct. 6, Oct. 7, and Price.

Official telegraphic quotations, San Francisco Stock Exchange.

MEXICO.

Week ending Sept. 21.

Table of stock quotations for Mexico, listing companies like Alianza, Amistad y Concordia, Anguliana, etc., with 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 \$50 or \$100. Prices are in Mexican dollars.

STOCK QUOTATIONS.

LONDON.

Sept. 24

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

PARIS.

Week ending Sept. 23

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

*From our special correspondent.

VALPARAISO, CHILE.

Aug. 28

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

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

SHANGHAI, CHINA.

Sept. 3

Table of stock quotations for Shanghai, China, listing company names, countries, number of shares, value, last dividends, and current prices.

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

† Dividend pending. | Rights pending.

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, number 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. * September dividend paid. * New assessment.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and Amount of Last. Includes entries for Adams, s. l. c., Anaconda, American Gold, etc.

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

RARE ELEMENTS, CHEMICALS AND MINERALS—CURRENT PRICES.

NOTE.—This table is revised up to September 14th. 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, Alum, Aluminum, Ammonia, Antimony, Argon, Arsenic, Asbestos, Barium, Barytes, Bauxite, Benzole, Bismuth, Bitumen, Bone Ash, Borax, Bromine, Cadmium, Calcium, Carbonate, etc., with their respective prices.

Table listing various chemicals and minerals such as Calcium, Cement, Ceresine, Chalk, Charcoal, Clay, China, Chlorine, Chrome Ore, Cobalt, Copper, Feldspar, Flint, Fluorspar, Fuller's Earth, Gypsum, Kaolin, Kryptolith, Lead, Lime, Magnesium, Manganese, Marble, Mercury, etc., with their respective prices.

Table listing various chemicals and minerals such as Mineral Wool, Nickel, Oils, Ozokerite, Paints and Colors, Potassium, Pyrites, Quartz, Sal Ammoniac, Salt, Silica, Silver, Soda, Strontium, Sulfur, Tantalum, Tellurium, Tin, Titanium, Vanadium, Zirconium, etc., with their respective prices.

Table listing various chemicals and minerals such as Argon, Barium, Beryllium, Boron, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Germanium, Glucinum, Helium, Indium, Iridium, Lanthanum, Lithium, Molybdenum, Niobium, Osmium, Rhodium, Rubidium, Ruthenium, Selenium, Silicium, Strontium, Tantalum, Thallium, Thorium, Titanium, Vanadium, Wolfram, Yttrium, Zirconium, etc., with their respective prices.

ALPHABETICAL INDEX TO ADVERTISERS.

(-) Indicates every other week or monthly advertisements.

Table with 3 columns of advertiser names and their corresponding page numbers, organized alphabetically from A to Z. Includes sub-sections for 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.

BOILER COMPOUNDS

are numerous, but what you want is one that will cure. WE HAVE IT. . . .



THE A. B. C. ALKALI WATER PURIFIER is the A-I Remedy.

It costs you nothing beyond express charges to send us a gallon jug of your Feed Water We examine same and send you guaranteed accurate analysis. Our trade with the mines is constantly growing, because our compound does clean boilers. WE ARE MAKING A SPECIALTY OF MINE TRADE.

THE J. H. PARSONS CHEMICAL CO., 1511-13-15 Masonic Temple, CHICAGO, ILL.

THE HARRINGTON & KING PERFORATING CO. CHICAGO.

METALS PERFORATED AS REQUIRED.
FOR MINING SCREENS OF ALL KINDS.
 STANDARD SIZES PERFORATED TIN AND BRASS ALWAYS IN STOCK.

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MINERS' CHEMICALS.
FUERST BROS. & CO. 2 Stone St. New York.

VOLLMER AND BEATON,
 Lead Burners and Chemical Plumbers.

Practical experience in the erection of Acid Chambers, Glover and Gay Lussac Towers, and all lead work in connection with Chemical Works, Copper Works, Smelting Works, Chlorination Works, etc. Twenty years' experience.

JOHN VOLLMER, 18 Oregon St., Roxbury, Mass. D. A. BEATON, Box 54, Woburn, Mass.

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MUST BE SUPERBLY BUILT.

FOR UNDERGROUND WORK THEY MUST BE DAMP-PROOF AND INCORRODIBLE. THAT'S THE KIND WE MAKE.
 FOR ALL KINDS OF WORK THEY MUST "COME UP STRONG AND STAND UP LONG." THAT'S THE KIND WE MAKE.
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THAT'S THE KIND WE MAKE.

GET OUR CATALOG. CONNECT YOUR MINE, MILL AND OFFICE.

THE STROMBERG-CARLSON TELEPHONE MFG. CO.,
 76 W. JACKSON BUILDING, CHICAGO.

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 ONLY TEN CENTS A LINE.

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With the wires thoroughly crimped both ways. "We have originated," others have imitated.

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MANUFACTURERS OF
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 Write us direct for information.
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For full information write the undersigned for a copy
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 I. C. R. R. Co., 506 Central Station, Chicago.

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.

1541 WANTED—CONTRACTOR'S FOREMAN on work within 100 miles of New York. One thoroughly experienced and familiar with all the latest methods of working rock drills, blasting and using steam shovels and railroad track work. Send copy of references and state salary required. Address H., ENGINEERING AND MINING JOURNAL.

1542 WANTED—STEAM DRILL REPAIR man to take charge of all repairs on fifteen Sergeant drills. Send copy of references and state salary wanted. Address D., ENGINEERING AND MINING JOURNAL.

1544 MEN WANTED FOR BRITISH Guiana, familiar with diamond drills. Address, stating experience and references, X. Y., ENGINEERING AND MINING JOURNAL.

1545 WANTED—SUPERINTENDENT FOR Sulphuric Acid Works. Give particulars. Address ACID, ENGINEERING AND MINING JOURNAL.

1546 WANTED—CHEMIST AND METAL- lurgist with especial experience in working zinc ores, as well as erection and management of plant for that purpose. State previous experience. Address ZINC, ENGINEERING AND MINING JOURNAL.

1547 WANTED—A THOROUGHLY COM- petent mining engineer, who has had experience in Alaska, and desires to join an exploring expedition that will start for the Yukon on March 1st, 1897. Address ALASKA ENGINEERING AND MINING JOURNAL.

1548 THERE IS A VACANCY ON THE staff of the ENGINEERING AND MINING JOURNAL. Applicants should have had experience in mining and in editorial work. Address EDITOR, ENGINEERING AND MINING JOURNAL.

1549 WANTED—A COMPETENT ENGI- neer to take charge of the construction of a railroad, where a permanent situation may be secured, if references, work and business connections are satisfactory. Address RAILROAD AND MINE, ENGINEERING AND MINING JOURNAL.

1550 ACID MAKER WANTED BY A large Southern fertilizer factory located in South Carolina. Applicants must be sober, reliable, with good ability to handle labor, burn lead and obtain best yield sulphuric acid. Address, stating family, salary expected and references, B. F., ENGINEERING AND MINING JOURNAL.

1551 WANTED—A THOROUGHLY PRAC- tical and competent mining engineer; one who understands assaying and surveying; must have a practical knowledge of placer mining; to go with large prospecting party to Alaska next March. Best of references required. Address G. No. 26, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

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

A MINING ENGINEER, AGE 26, DESIRES position; has energy, executive ability, experience in management and direction of large forces of men and familiar with business methods. Thorough assayer, chemist and bookkeeper. Address THOROUGH, ENGINEERING AND MINING JOURNAL. No. 18,094, Nov. 6.

ELECTRICAL ENGINEER, 16 YEARS IN- stallng electric power and lighting plants, desires position with Mining, Milling or Power Company where past experience will be beneficial; have new system of treating ores electrically. Address ELECTRICAL, ENGINEERING AND MINING JOURNAL. No. 18,111, Oct. 16.

HAVE 20 YEARS' EXPERIENCE IN MINING and treating gold and silver ores; technical education; American, and familiar with Spanish and German; desire position as superintendent, manager or assistant, and will make examinations in the U. S. or Spanish-America; London and American references. Address J. L. P., care Geo. Bond, 433 Drexel Building, Philadelphia, Pa. No. 18,113, Oct. 16.

COMPETENT MAN DESIRES POSITION AS foreman or assistant superintendent; 16 years' experience on California and Alaska ores; amalgamating, concentrating and assaying; references. Address E. NEWBERG, Mills College, California. No. 18,112, Nov. 6.

A MINING ENGINEER, ENERGETIC, TECH- nical education, experienced in the management of men, 10 years' practice in charge of mines, desires position as manager or superintendent; speaks Spanish; excellent references. Address FILON, ENGINEERING AND MINING JOURNAL. No. 18,097, Nov. 6.

ASSISTANT SUPERINTENDENT OF HY- draulic Gold Mines, with first-class references and long practical experience, will shortly be open to engagement. Address T., ENGINEERING AND MINING JOURNAL. No. 18,108, Oct. 16.

WANTED BY MAN OF EDUCATION AND 12 years' experience, age 35, the management of a mining or milling property. Can furnish exceptional credentials. Address W., 548 Equitable Building, Denver, Colo. No. 18,104, Oct. 16.

A MINING ENGINEER, FAMILIAR WITH mining, able to develop and work a mine, desires position with prospecting party. References given. Address P. H., ENGINEERING AND MINING JOURNAL. No. 18,098, Oct. 16.

WANTED—POSITION AS MANAGER OR Superintendent by a mining and metallurgical engineer with technical education and 16 years' experience in Colorado. Specialty—Fine concentration. Highest references. Address G. S. A., ENGINEERING AND MINING JOURNAL. No. 18,107, Oct. 23.

MANAGER OR MINE SUPERINTENDENT of extended experience, just returned after two years of successful operating in Central America, desires position with a strong company, either in prospect development or in established mining. Is a good organizer and fully posted as to details in mining both in the Northern countries and in the tropics. Best of testimonials and references. Address EXPERIENCED, ENGINEERING AND MINING JOURNAL. No. 18,105, Nov. 20.

MINING ENGINEER, HAVING OVER 20 years' experience in gold and silver mines, and proficient in the Spanish language, desires employment as manager, or would be willing to examine and report on mining properties in any part of the world; is a good surveyor and assayer; member of the American Institute of Mining Engineers; excellent references and testimonials. Address MINING ENGINEER, 37 Seventh Avenue, New York City. No. 18,110, Oct. 16.

WANTED—POSITION AS ASSAYER OR mill man; eight years' experience; first-class references; is fair draughtsman; understands amalgamation and concentration; will go anywhere; would take charge of small mill and do the assaying. Address WADE, ENGINEERING AND MINING JOURNAL. No. 18,109, Nov. 27.

WANTED—POSITION AS MANAGER OR Superintendent of Mine by a mining and metallurgical engineer of 18 years' experience, graduate of technical college; Rocky Mountain region preferred. Address W. M. C., ENGINEERING AND MINING JOURNAL. No. 18,110, Oct. 30.

A MINING ENGINEER WITH A SUCCESS- ful record is open to an engagement as superintendent and manager; in the prime of life; full references given; can organize and manage men, and is thoroughly posted in designing and operating machinery and in all construction. Address "RECORD," ENGINEERING AND MINING JOURNAL. No. 18,117, Oct. 30.

PHYSICIAN, GRADUATE REGULAR MED- ical College, desires position as physician to mining company or corporation; highest references; correspondence solicited. Address D. F. DE FOREST, M. D., Booneville, Indiana. No. 18,115, Oct. 16.

\$7,800 GIVEN AWAY TO PERSONS making the greatest number of words out of the phrase "Patent Attorney Wedgerburn." For full particulars writhe National Recorder, Washington, D. C., for sample copy containing same.

CONTRACTS OPEN.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., October 6th, 1897—Sealed proposals will be received at this office until 2 o'clock p. m. on the 27th day of October, 1897, and opened immediately thereafter, for all the labor and materials required to fix in place, complete, the low pressure, return circulation, steam heating and ventilating apparatus for the U. S. Post Office building at Saginaw, Mich., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Saginaw, Mich. The right is reserved to reject any or all bids, and to waive any defect or informality in any bid, should it be deemed in the interest of the Government to do so. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for the Heating and Ventilating Apparatus for U. S. Post Office at Saginaw, Mich.," and addressed to CHARLES E. KEMPER, Acting Supervising Architect. Orig.

ELECTRIC LIGHT.—Sealed bids will be received at the City Hall, in Somerset, Ky., until 10 a. m., on December 13th, 1897, to light the streets of said city by means of electricity, and to furnish commercial lights by electricity to the citizens thereof. Said bids will be awarded to the highest and best bidder, the right to reject any and all bids being reserved. Full information can be had by application to the Mayor or City Clerk.

TOBIN BRONZE.—Sealed proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock m., October 26th, 1897, and publicly opened immediately thereafter, to furnish at the New York Navy Yard a quantity of cleaning paste, putty, litharge, wood filler, Tobin bronze, sheet lead, cotton waste, lamp wick, copper tube, brass grommets, fire clay bag duck, cotton braid, tinned corned beef and rice. Blank proposals will be furnished upon application to the Navy Pay Office, New York. EDWIN STEWART, Paymaster-General, U. S. N.

MASONRY.—Sealed bids for building three sections of the Charlestown approach for the Charlestown bridge will be received by the Boston Transit Commission, at its office, 20 Beacon Street, Boston, Mass., until 12 o'clock m. of Thursday, October 21st, 1897, and at that time and place will be publicly opened and read. No bid will be received and deposited unless accompanied by a properly certified check for the sum of Five Thousand Dollars, payable to the order of the Treasurer of the City of Boston, which check will be returned to the bidder unless he fails to execute the contract, should it be awarded to him. Notice to contractors.—Bid, contract, specifications and bond can be obtained and plans can be seen at the office of the City Engineer, City Hall, Boston, on and after Tuesday, October 12th, 1897. The Commission reserves the right to reject any and all bids.

DAM AND RESERVOIR.—Sealed proposals for building an intake dam and gate house and a distributing reservoir will be received by the Water Commissioners at the Town Hall, Westfield, Mass., until 12 o'clock noon, October 27th, 1897. Each bid must be accompanied by a certified check for five hundred dollars (\$500) payable to the Board of Water Commissioners of the town of Westfield, as a guarantee of good faith, in the usual manner. Plans can be seen and blank forms of specifications, contract and proposals obtained at the office of Town Engineer, Town Hall, Westfield, Mass. The Water Commissioners reserve the right to reject any and all bids.

LOCKS.—U. S. Engineers Office, Custom House, Cincinnati, O.—Sealed proposals for building locks numbered two, three, four and five, Ohio River, will be received here until 2 p. m., October 26th, 1897, and then publicly opened. Information furnished on application to Mr. WILLIAM MARTIN, Davis Island Dam (P. O. Box 670, Pittsburg, Pa.) or to W. H. HEUER, Maj. Engrs.

(Continued on Page 21.)

THE ENGINEERING AND MINING JOURNAL

ADVERTISING RATES.
(NONPAREIL MEASUREMENT.)

	Lines.	Inches.	Regular Edition 1 time.	One Month 4 times.	Three Months 13 times.	Six Months 26 times.	Nine Months 39 times.	Twelve Months 52 times.
	6	1/4	\$2	\$5	\$12	\$20	\$28	\$34
	9	1/4	3	8	16	28	38	47
	12	1/4	4	11	20	35	47	60
	15	1/4	5	14	24	42	57	73
	18	1/4	6	17	28	50	68	87
	21	1/4	7	20	32	58	78	100
	24	1/4	8	23	36	66	89	112
	27	1/4	9	26	40	74	99	125
	30	1/4	10	29	44	82	108	137
	33	1/4	11	32	48	90	117	149
1/2 Column.	36	1/4	12	35	52	98	126	161
	39	1/4	13	38	56	106	135	173
	42	1/4	14	41	60	114	144	184
	45	1/4	15	44	64	122	153	194
	48	1/4	16	47	68	130	162	204
	51	1/4	17	50	72	138	171	214
	54	1/4	18	53	76	146	180	224
	57	1/4	19	56	80	154	189	234
1/2 Column.	60	1/4	20	59	84	162	198	244
	63	1/4	21	62	88	170	207	254
	66	1/4	22	65	92	178	216	264
	69	1/4	23	68	96	186	225	274
	72	1/4	24	71	100	194	234	284
	75	1/4	25	74	104	202	243	294
	78	1/4	26	77	108	210	252	304
	81	1/4	27	80	112	218	261	314
	84	1/4	28	83	116	226	270	324
	87	1/4	29	86	120	234	279	334
	90	1/4	30	89	124	242	288	344
	93	1/4	31	92	128	250	297	354
	96	1/4	32	95	132	258	306	364
1/2 Page....	102	1/4	38	112	156	306	364	448
	108	1/4	42	124	172	336	402	496
	114	1/4	46	136	188	366	438	528
	120	1/4	50	148	204	396	474	560
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DIVIDENDS

ISABELLA GOLD MINING COMPANY. 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.

HOMESTAKE MINING COMPANY, MILLS BUILDING, 15 BROAD STREET, NEW YORK, Oct. 15, 1897. DIVIDEND NO. 231.

The regular monthly dividend, TWENTY-FIVE (25) CENTS PER SHARE, has been declared for September, payable at the office of the company, San Francisco, or at the transfer agency in New York, on the 25th inst. Also an EXTRA DIVIDEND (No. 232) of Twenty-five (25) Cents per share, payable at the same time and place. Transfer books close on the 20th inst. LOUNSBERY & CO., Transfer Agents.

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CONTRACTS OPEN.

Continued from Page 20.

PUMPING ENGINE.—Proposals will be received at once by the Paducah Water Company, of Paducah, Ky., for furnishing one 4,000,000 g. l. vertical compound pumping engine. PADUCAH WATER COMPANY.

SEWERAGE SYSTEM.—Sealed proposals for constructing a complete system of sewerage in the City of Savannah, Ga., will be received by the Committee on Drainage until 12 o'clock noon, Eastern time, November 15th, 1897. The right to reject any or all bids is reserved. The work will consist approximately of forty miles of pipe sewers with all necessary appurtenances. Complete plans and specifications are now in course of preparation, and will be ready for inspection by contractors proposing to bid for the work, at 12 o'clock noon, Eastern time, November 1st, 1897, at the office of the City Engineer, Savannah, Ga. Address COMMITTEE ON DRAINAGE, Care of Clerk of Council, Savannah, Ga.

STONE SIDEWALKS.—Sealed proposals will be received by the Mayor and Council of Roselle, N. J., until October 20th, 1897, at 8 p. m., for furnishing and laying not exceeding 10,000 running feet of first quality stone, four feet wide and not less than two inches thick, and no stone to contain less than eight square feet, to be laid upon a foundation not less than six inches deep of cinder sand or crushed stone. Walks to be laid to a grade to be furnished by the Borough and stones to be cut straight, so that they will fit properly against each other, and to be laid so as to preserve a straight line along the sides. Cinders can be purchased within half a mile of where flagging is to be laid.

The party making proposal must agree to lay all walks ordered during a period of three months from October 20, at the price named in proposal, whether 10,000 running feet more or less.

A bond of \$1,000 with satisfactory sureties will be required for faithful performance of the work.

All work must be finished within 30 days from time of order.

Bids to be addressed to G. A. RAWLINS, Clerk, Roselle, Union Co., N. J.

The council reserves the right to reject any or all bids.

DREDGING.—U. S. Engineer Office, 905 1/2 East Main St., Richmond, Va. Sealed proposals for deepening and widening channel of James River, Va., and for constructing, repairing and revetment of windams will be received here until 12 m., October 27th, 1897, and then publicly opened. Information furnished on application here to H. D. Whitcomb. CHAS. J. ALLEN, Lt. Col. Engrs.

SUBWAY.—Sealed bids for building Section 11 of the subway will be received at the office of the Commission, 20 Beacon street, Boston, Mass., till 12 o'clock M., of Thursday, October 28th, 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 with concrete and granite side walls, and the remaining portion will be covered. The covered structure will consist of a combination of steel and masonry. Some of the items are estimated to be as follows: 14,000 cu. yds. earth excavation; 210 tons iron and steel, furnished by Commission, to be set in place; 6,000 cu. yds. concrete, stone 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.

SEWERS.—Sealed proposals will be received by the Board of Public Works of the city of St. Joseph, Mich., until 2 p. m., November 9th, 1897, for the construction of about eleven thousand (11,000) lineal feet of sewer. Plans and specifications can be seen at the office of the city clerk of St. Joseph, Mich., or at the office of the consulting engineer, A. V. Powell, Room 615 Chamber of Commerce, Chicago, Ill.

PROPOSALS FOR THE CONSTRUCTION OF SEWERS.—Office of the Commissioners, D. C., Washington, D. C.—Sealed proposals will be received at this office until 12 o'clock m., October 23d, 1897, for constructing sewers in the District of Columbia. Specifications and blank forms of proposals and all necessary information may be obtained at this office. The right is reserved to reject any and all bids or parts of bids. JOHN W. ROSS, JOHN B. WIGHT, WM. M. BLACK, Commissioners, D. C.



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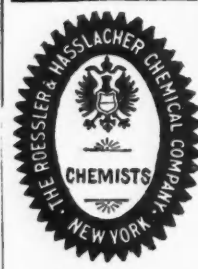
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