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* Illustrated.

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Mexico has now become a producer of sulphur, aside from that which is obtained from the crater of Popocatepetl for local consumption, a trial consignment having been received recently at Yuma from the mines in Lower California, which are being exploited by an American company. Arrangements for the construction of an aerial tramway to bring sulphur on a large scale from the summit of Popocatepetl to the foot of the mountain have been discussed for a long time, and surveys have been made, but we have not yet heard that actual operations have been commenced.

Progress is being made at Cripple Creek in the construction of the electric tramway, which is intended to connect the principal mines with the railway shipping stations and the local reduction works. The line, which will be about 20 miles long, has a maximum grade of 7.5 per cent. and a minimum radius of curvature of 100 feet. It is being laid with 60-pound rails. The result of this undertaking will be awaited with a good deal of interest, since the long wagon haul from most of the mines of the Cripple Creek district, over exceedingly bad roads (which at certain seasons of the year are often impassable), is a heavy charge on the low grade ore. If the new tramway company is able to give the miners lower rates for the carriage of their product and at the same time give its own stockholders a reasonable return upon their investment, the construction of similar lines in other important districts will undoubtedly be undertaken. We have often in these columns referred to the bad condition of the ore roads in almost all of the Western mining districts, and the high cost of wagon transportation, which in many cases amounts to 20 or 25 per cent. of the cost of mining the ore, and there is surely room for greater economy in this direction.

The traffic through the Sault Ste. Marie Canal has been very large this season. The report for the year up to October 1st shows the effect of the enlargement of the locks at the Sault and the work done on the lake channels elsewhere. The number of vessels passed through the canal was 13,156, or 1,894 less than for the corresponding period in 1896, but the total freight carried, 13,589,183 tons, showed an increase of 795,742 tons. The most important single item of freight carried is iron ore, which this year amounted to 8,589,702 tons, the largest shipments ever reported at a corresponding date, and 1,777,937 tons more than in 1896. Coal carried was 1,507,993 tons, or 835,329 tons less than last year; but this decrease was due to the long strike of the miners, which seriously interfered with the lake trade this season.

The effect of the lake improvements will be more fully shown next season, when the Rockefeller-Carnegie interest will have in service three ships which are now under construction, and which are expected to carry at least 6,500 tons of iron ore each trip, or nearly 2,000 tons more than the present maximum load. These vessels will be 475 feet long and 50 feet beam; they will be driven by quadruple-expansion engines, using steam at 200 pounds boiler pressure.

The rainfall in Mexico has been unusually heavy this year, the rainy season having begun early and lasted late, therefore the prospects for the corn crop are very bright, and many of the mines are experiencing difficulty in obtaining an adequate supply of labor in consequence. It is not improbable that the labor question may become a serious one in Mexico as the industrial development of that country proceeds; not that there are likely to be strikes (the Mexicans not yet having grasped the idea of trades unions), but simply through inability to secure a sufficient number of men at the places where they are wanted. There is an abundance of laborers in certain of the large cities, like the capital, Zacatecas and Guanaajuato, but they are not at all inclined to go to remote districts in the sierras, though higher wages may be offered them there; not even when they may be quite without work at their homes. The scattered mining districts are therefore dependent chiefly upon the natives of the surrounding region, and these at the beginning of the rainy season are apt to quit work in the mines to go to their cornfields, not returning until after the harvest. The exodus is especially large when the agricultural prospects are good. All efforts to eradicate this custom seem unavailing. It is quite useless to point out that a man can earn money enough in the mine to buy more corn than he can grow and live better in the meanwhile; he leaves the mine and plants corn notwithstanding. The summer months are usually a vexatious time in mining in Mexico, what with the shortage of labor and the hindrance to operations which the heavy rains themselves cause.

The Valuation of Mining Property.

The value of a mining property consists of two elements: 1. Its apparent value, or that which results from ore "in sight," less the cost of extraction; and 2. Its prospective value, which represents that which may exist beyond what is in sight. The former is capable of more or less accurate determination; the latter is obviously uncertain, but upon it the fixing of the price of a piece of mining property for sale chiefly

depends since it is clear that a mine is always worth the net value of the ore which is really in sight.

It is necessary to use this qualification "really in sight," because the expression is often employed improperly. Ore is not really "in sight" unless it blocked out in the plane of the vein into patches of moderate size; if the vein is thick, either raises or crosscuts are also necessary in order to show its third dimension. The size of the blocks which it may be reasonably safe to estimate as in sight is governed by various conditions, chief of which are the regularity of the vein and the grade of its ore. If we imagine a vein of such thickness that the entire breast of ore is exposed in the shaft, drift or other opening, at least three sides of a rectangle must be shown to permit its entire area to be calculated as really in sight; two adjoining sides will give only a triangular patch, and on an exposure of only one side no ore whatever may be calculated as in sight. The presumption may be strong that the ore extends beyond the vision, and in this case the prospective value of the mine will be influenced by the showing; but, on the other hand, it may not. There have been instances where a drift, with no openings above or below it, has shown a strong face of ore in roof and floor for a considerable distance, while subsequent stoping has demonstrated that it was a thin, elongated ore body, lying horizontally, through which the drift had passed like the lead in a pencil.

The prospective value of a developed mine may be said to depend solely upon the geological conditions shown in that particular mine. The fact that certain results were obtained in a similar mine a thousand miles or a thousand feet away should have very little weight, although often it is given a good deal. Nevertheless the general geological features of the district are not to be overlooked. In any case, however, the determination of the prospective value of a mine is largely a matter of opinion, and opinions are apt to be beyond the truth. In the valuation of an undeveloped mine, a "prospect," its worth is entirely prospective as is indicated by the colloquial term descriptive of it.

The Proposed Revision of the United States Mining Law.

The Denver Mining Congress of last July may have wrought better than it knew when it created a committee on revision of the mining laws of the United States. Perhaps the time has come when the obstinate prejudice of mining prospectors and locators will give way to the logic of the situation, and when even the radical change which is required can be made. I am not sanguine as to this, having grown discouraged in the warfare of many years. But I shall heartily support every effort in that direction, and do my best to hope for its success. Perhaps, after all, I am not able to judge fairly of the prospects of a favorable result. I confess it has seemed to me as if the folly of our people had decreed that no reform of our bad law should be effected until it should be too late for reform to do any good; as if the two great resources of our wild public domain—minerals and timber—must be wasted irretrievably before either private or public administration of them could be organized and protected. And it may be that my despair at this time arises chiefly from a superstitious feeling that it is not yet quite too late, and that therefore the time decreed has not arrived.

On the other hand, there are some elements in the present condition of affairs which strongly favor a moderate hope of change in the public opinion of our Western mining communities. The ore deposits in many of our leading mining districts, at the present time—notably at Cripple Creek, for instance—are almost impossible of handling under the Apex law, and its vicious requirement of a "discovery" before location. Without a "discovery," no location; without an "apex" as well as a "discovery," no defined and secure rights under a location. Practical locators are realizing more than ever the difficulties thus imposed upon honest explorers and would-be mine owners. And capital is more than ever cautious concerning the risks of litigation, which may bring ruin after all legitimate mining risks have been overcome. Meanwhile, there are new and inviting fields of mining investment in other countries, not afflicted with "apex" laws; and American miners are sometimes beginning to perceive that our system of mineral titles puts them at a disadvantage in seeking the aid of capital.

Some of the principal weaknesses of our system are clearly set forth in the *San Francisco Mining and Scientific Press* of October 2d by Mr. Francis T. Freeland, a member of the Denver Convention committee. Mr. Freeland urges the following improvements, which, as will be seen, are revolutionary:

1. Location without discovery.
2. Official survey in plots of 10 acres or less, in one piece of any shape, free from conflicting claims.
3. No required "assessment work," but a Federal tax of \$50 per claim annually until the issue of patent; the recorded receipt of the Land Office to carry title, and failure in payment of the tax to work forfeiture.
4. Vertical boundaries and no extra-lateral rights.

The relative importance of these propositions does not, in my judgment,

correspond with the order in which they stand above, as given by Mr. Freeland. The most vitally important is the last named—the abolition of the extra-lateral right. That being once accomplished, every tract of mineral land thereafter located will be subject to the simple rules of the common law, under which mining in most of our States, and in other countries, is done already. Every owner or lessee or possessory tenant of such a tract will know just what his rights are. The further questions, upon what conditions title shall be acquirable, how it shall be recorded and maintained, how much shall be paid for it by way of tax or of purchase-money, how large shall be the maximum tract granted to one location, and what shall be its shape, are of minor significance. No change in any one of these particulars will be an adequate reform, unless the extra-lateral right is first abolished. After that has been done the proper adjustment of these subordinate particulars will be imperatively necessary, as an incident of successful administration.

The chief of these, again, is the question of a required discovery. I heartily agree with Mr. Freeland in advocating a right of location without discovery. My views on this point were expressed long ago. The requirement of a "discovery" is practically a farce. All that is really exacted is a declaration, without proof, that a discovery has been made; and if this declaration was a mistake, or a lie, there is no way of correcting it after the issue of a patent except the cumbersome proceeding of a direct attack on the patent by suit to have it set aside. The patent cannot be collaterally attacked in any other proceeding. It would be much simpler and better to let any location of mineral land be made without discovery. Possessory ownership of it would have to be maintained by annual work or payments, as the law might provide. Permanent ownership would have to be got by purchase. In either case the United States would not be damaged if there were no discovery made before the title was granted. The private owner of a piece of supposed mineral land would scarcely be such a fool as to say to a proposing purchaser, "If this land is valuable, I will sell it to you for so much per acre. If it is worthless, or if you have not found out yet whether it is valuable or not, I will not sell it to you at all." Yet that is what the requirement of a "discovery" amounts to.

Mr. Freeland's proposal that claims shall be permitted to have any shape follows naturally from the adoption of vertical boundary planes. That change would leave no more reason for requiring that mining locations should have a particular shape than there now is for a similar restriction upon farms. It may be, however, a good policy to require simple forms in new districts, not yet partially occupied by claims, and already laid out by the surveyor. This is the practice as to agricultural lands, and the mineral land laws have been made even worse than they would otherwise be by the policy of making no official surveys until after the location of claims, and then surveying only the single claims applied for.

The proposed tax of \$50 per annum for claims of 10 acres or less, in lieu of the \$100 "assessment" work on claims of 20 acres or less, is an improvement, as tending to simplify the operation of the law, and discourage the holding of claims without patenting them. The "assessment work" now done is admitted to be in most cases a mockery. The money, if really expended, is practically squandered (unless much more is spent than the law requires), and it might as well be paid into the treasury of the government as wasted on the surface of the ground.

I await with much interest the report of the committee of which Mr. Freeland is a member. Another member is Mr. W. S. Keyes, a veteran engineer and mine operator, who has been persistently in favor of a radical reform in the mining law for many years, having advocated the principle of the "square location" as long ago as 1868, almost immediately after the passage of the "law of the apex."

R. W. RAYMOND.

NEW PUBLICATIONS.

INDIANA, DEPARTMENT OF GEOLOGY AND NATURAL RESOURCES. THIRTY-FIRST ANNUAL REPORT, 1896. W. F. Blatchley, State Geologist. Indianapolis, Ind.; State Printer. Pages, 720; with map and illustrations.

The first portion of this report is a brief summary by the State Geologist of the natural resources of the State, and an account of the work done by the Geological Survey in 1896. This is followed by papers on the petroleum industry of the State by Mr. Blatchley; on Indiana coals, by W. A. Noyes; on the New Albany black slate, by Hans Duden; on Indiana caves, by Mr. Blatchley; on the geology of the middle and upper Silurian rocks of Southern Indiana, by A. F. Foerste; on the Bedford Oolitic limestone, by T. C. Hopkins and C. D. Siebenthal; on the geology of Vigo County, by J. T. Scovell. The reports of the State inspector of the mines and of the supervisors of oils and natural gas are also included. The longest and perhaps the most important of these papers, occupying about 140 pages, is that on the Bedford limestone, which is a study not only of the geological features of the deposits but of their commercial and economical value, and appears to have been very carefully and thoroughly prepared. Next in importance to this, although not in length, is the paper on the petroleum industry. Coal is rather briefly treated, having received attention earlier. From the Inspector's report it appears that coal mining was carried on in 1896 in 17 counties, and at the close of the year there were 121 mines opened, giving employment to 7,012 men.

OUR COAL RESOURCES AT THE CLOSE OF THE NINETEENTH CENTURY. By Edward Hull. London; E. & F. N. Spon. New York; Spon & Chamberlain. Pages, 160; illustrated. Price, \$2.50.

Mr. Hull's work is a study of the coal-fields in Great Britain, with special reference to their possible future developments and the supply which may hereafter be drawn from them. It is supplementary to a previous work on the same subject. The mines of England, Wales and Scotland are considered in detail, and a summary of their condition at the close of the nineteenth century is added. There are also supplementary chapters on the approximate limit of deep mining and on foreign coal-fields, the latter being an extremely brief summary—so brief, in fact, as to be very imperfect. The statistics in this chapter are also by no means recent, the latest figures given for the United States being for 1893, although figures for 1896 are obtainable.

ONTARIO BUREAU OF MINES, BULLETIN NO. 3. PRELIMINARY REPORT ON THE MICHIPICOTON MINING DIVISION. By Arthur B. Willmott. Toronto, Ontario; Published by authority of Hon. J. M. Gibson, Commissioner of Crown Lands. Pamphlet. Pages, 12.

The promptness with which the Ontario Bureau of Mines issues documents of interest has been heretofore referred to, and the present case is no exception. The Michipicoton region was declared a mining division by an Order in Council on September 9th, and the preliminary examination was at once begun. The division embraces a tract of 5,000 square miles, and was described briefly in an article in the *Engineering and Mining Journal* for September 25th 1897, (page 369). As may be supposed from the short time which has since elapsed, the examination has been only a superficial one, but nevertheless the pamphlet gives many interesting particulars as to the physical peculiarities of the country and its surface geology. There is also some historical matter in relation to the district from which it appears that some exploration was done as long ago as 1871, although at that time copper and silver were sought for and not gold. The conclusion drawn from the present examination is that gold is most likely to be found in considerable quantities in the district, though discoveries of nickel, iron and copper have also been reported. The prospecting has been almost entirely confined to the country around Lake Wawa.

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.

The Adams Cable Code. Boston, Mass.; F. O. Houghton & Company. Pages, 198. Price, in paper, 25c.; cloth, 50c.

Report of the Sewerage Commission of the City of Baltimore, consisting of Mendes Cohen, F. H. Hambleton and E. L. Bartlett. Baltimore, Md.; 1897; Published for the Commission. Pages, 231; with colored plates.

The Geology and Veins of the Hauraki Gold-Fields, New Zealand. By James Park. Auckland, New Zealand; published by the New Zealand Institute of Mining Engineers. Pages, 106; with maps and plates.

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.

Coal in Southwestern Virginia.

Sir: Permit me to correct an error in your issue of October 23d. There is no coking coal in Montgomery County, Va. The ovens mentioned in your item must be in the bituminous coalfields to the southwest. The Brush Mountain coal in Montgomery County is semi-anthracite, at times approaching anthracite. An analysis of Smith's mine coal by McCreath gave: Water, 0.816; volatile matter, 11.324; fixed carbon, 75.618; sulphur, 0.697; ash, 11.545. This coal outcrops for 15 miles, and while its existence in the position found is due to faulting, there are 42,000,000 tons of it in sight. Last year 18,000 tons were mined, and this year there will be as much more. There has been no systematic mining, nor has the coal been developed below water level; farmers working at it for the most part after crops are gathered.

This coal is hauled by wagon from 7 to 12 miles at a cost of 7c. per bushel, but it sells at \$1 per ton more in the market than the best soft coal. It has been mined for the last 40 years, consequently the territory has been well developed and explored.

E. B. WILSON.
SALEM, VA., Oct. 25, 1897.

A Question in Chlorination.

SIR: Perhaps some of your readers who may have met with similar experiences to those which I now briefly describe will be good enough to mention them through the medium of your paper.

In a chlorination plant in which chlorine is generated by sulphuric acid and chloride of lime in vats apart from those used for solution, yellow crystals form in the indicator bottle on cold mornings. These crystals, when exposed to an increased temperature, first liquefy and then volatilize, giving off chlorine and leaving no residue. The same thing apparently takes place in the solution vats, for at times, some hours after the generator has been stopped in the early morning and the temperature has risen, chlorine is evolved in large quantities, so much so that on one occasion, after a severe frost, everybody was driven out of the building. This trouble never occurs if the generator is kept running continuously. It is the inclination to regard these crystals as chlorine hydrate, and as their formation under the circumstances mentioned has not before come within my notice, I am desirous of ascertaining whether this is a correct understanding.

R. HENRY WALCOTT.

MELBOURNE, VICTORIA, Sept. 17, 1897.

A Question of Claim Location.

Sir: I would like to submit the following question: S. owns a mine in Arizona, the claim having been patented in 1882. His claim is 600 X 1,500 ft. and the vein is near the center and runs nearly parallel with the side lines. Afterward a claim was located on a vein running parallel with that of S. and just outside the limits of his claim. This vein dips rapidly toward the vein on the patented claim and at a depth of 200 ft. is within the perpendicular plane drawn through the side line of the patented claim. Does the ore inside the plane of this side line (on the patented claim) belong to S. or to the locator of the claim, the apex of which is outside the patented claim?

WARRENSBURG, Mo., Oct. 18, 1897.

H. M.

[If the vein on the patented claim of S. not only runs nearly parallel with the side lines, but crosses the end lines of that claim, so that there can be no doubt as to the rights attached to it; and if the vein located outside, as described, is likewise regular in its relations to the side—and end—lines of its location, so that there is no doubt as to its extra-lateral right—in other words, if no side-issues of irregularity can be raised to complicate the question raised by our correspondent—then any ore within the patented claim which belongs to the outside vein—i. e., which can be traced to the apex of that vein—between the projected end-planes of the outside location, is the property of the later locator. If the ore in question belongs to both veins, it is the property of the patentee, not by virtue of his patent, but by reason of his earlier location. If it is a disconnected ore-body, not traceable to either vein, its upper edge will be a new apex, and it will be the property of the party under whose surface-location that apex lies. In this third case, the determination of the end planes bounding the ownership of the ore-body will depend upon its relation to the end lines of the surface claim under which its apex lies. That claim may be either one of the two described by our correspondent, or it may conceivably be a third location, altogether distinct from these. The qualified, complicated and incomplete nature of this answer to our correspondent's inquiry is partly due to the vagueness of the law, and partly to the incomplete statement of the question submitted. Assuming, however, that the case stated is in fact a simple one, and that the ore in question is ore in the vein of the later locator, the answer is, that it belongs to him unquestionably. The patent issued to S., as described, will be found on examination to contain an explicit reservation of all ore belonging to veins the apexes of which are not in the granted tract. This reservation is intended to cover, and does cover, such ore-bodies as we suppose our correspondent to have in mind; and consequently, as regards such ore-bodies, neither the patent of S., nor the previous discovery and location upon which his patent is founded, can give him any rights in the premises.]

R. W. RAYMOND.]

Chemists for City Work.—The Civil Service Commission of the City of Brooklyn gives notice that examinations will be held on November 15th next for a chemist in the Department of Health; on November 16th for a chemist in the Division of Water Supply, and on November 17th for an assistant chemist in the Bureau of Street Construction. Application should be made to the office of the Commission at the City Hall, Brooklyn.

The German Iron Industry.—Most of the large German iron foundries and steel works have now published their reports for the fiscal year 1896-97 and announced their dividends. The results are in most cases better than in the previous year, and confirm the reports which have appeared from time to time on the prosperous condition of the industry. Dividends, in spite of increased sums written off and put to reserve funds, are generally large. The Dortmund Union Mining, Iron and Steel Company pays 12½%, after writing off 1,033,000 marks; the Iron and Steel Works, Hoesch, proposes to pay 12%; the United Koenigs & Laura Hütte proposes to write off 3,000,000 marks and to pay 10% on its share capital. The Dortmund concern "Roth Erde" pays 10%. The Geisweider Iron-Works pays 14% on the ordinary and 16% on the preference shares, against 7% and 9% respectively a year ago. The Austrian company "Rudolphshütte," divides 2½%.

Improvements in Precipitation of Gold from Cyanide Solution.—J. S. MacArthur has taken out United States patent No. 592,153, dated October 19th, 1897, upon an improvement in the precipitation of gold by means of zinc from cyanide solutions containing copper, which is ordinarily precipitated on the zinc, interfering more or less with the precipitation of gold and silver. The zinc is previously coated, according to the new specifications, with metallic lead, the shavings being conveniently prepared by immersing them for about a minute in a solution containing about 1% of lead in the form of acetate or some other suitable salt. In the case of solutions containing mercury, metallic lead, preferably in the form of shot, is added, the claim being that the mercury, and possibly a little of the silver, will be precipitated on the lead, while the precipitation of the gold and the remainder of the silver will proceed without inconvenience on the zinc.

Carburizing Steel in the Bath.—The *Iron and Coal Trades Review* reports the following method which has recently been suggested for the carbonization of steel. After the metal has been both dephosphorized and deoxidized the basic properties of the slag are increased by an addition of burnt lime, and then an iron ring coated with burnt magnesite or dolomite is placed upon the bath. The ring sinks through the slag cover, and remains swimming about the steel bath, but it must be sufficiently deep to allow its upper edge to reach above the slag. The slag within the ring or frame is now skimmed off, so that a metal surface is exposed. Thoroughly dried and well-ground coke is now sprinkled upon the fluid metal, by which the carbon is eagerly absorbed. To obtain a uniform carbonization the ring is moved upon the bath in different directions during this process, and the bath is stirred constantly. This method is said to prevent the reduction of phosphorus from the slag by carbon, as the latter is isolated from the bulk of the slag in the furnace by means of the magnesite ring described.

THE MINERAL PRODUCTION OF QUEBEC.

The following official statement shows the mineral production of the Province of Quebec for the year 1896, the figures being compiled from the reports filed by mining companies in accordance with the law:

	Mined.	Exported.	Men employed.	Value mined.
Gold	30,122	22,123	20	\$6,000
Copper ore	Tons 30,122	22,123	233	950,500
Asbestos	" 5,074	6,901	33	180,163
Chrome ore	" 3,693	3,041	104	47,387
Iron ore	" 6,905	6,905	122	165,960
Mica	" 95	51	60	31,855
Graphite	" 13,600	12,000	40	12,000
Limestone	Lbs. 385,000	210,000	40	10,000
Totals	Tons 15,000	14,000	1,139	\$1,595,865

The ton used is the short ton of 2,000 lbs. The quantity and value of clay are not reported, but there were 12,000,000 brick made, valued at \$60,000; 100 men were employed in that industry.

TANK RESIDUES IN ELECTROLYTIC COPPER REFINERIES.

Edward Keller, in the *Journal of the American Chemical Society* XIX., No. 10, states that the production of electrolytic copper and its separation of other metals by means of the electric current was first established on a commercial scale by James B. Elkington, of England. In two patents, No. 2,838, November 3d, 1865, and No. 3,120, October 27th, 1869, he laid down all the essential points of the processes which guide the operations at the present day.

Various modifications have been developed from this original process, but in all systems the precious metals and part of the impurities of the dissolved anodes, fall to the bottom of the tanks, forming there a sediment or residue, frequently also called slimes, mud, etc. In the following table are given partial analyses (oxygen and hydrate water were not determined) of residues from copper derived from ores from Butte, Mont., as also the composition of the corresponding anode copper. The copper of I. was made by the reverberatory, of II. by the converter process.

	I. Residues.		Anodes.	II. Residues.		Anodes.
	%	ozs.		%	ozs.	
Ag	53.894	15,718.7	100.1	55.150	16,085.04	100.47
Au	0.2959	86.3		0.198	57.749	
Cu	11.010			13.820		
Pb	0.910		0.0093	2.070		
Bi	3.930		0.0320	0.310		0.0035
Sb	0.250		0.0551	2.440		0.0510
As	2.107		0.0580	1.630		0.0180
Se	0.394		0.0098	0.718		
Te	1.174			0.892		
Fe				0.800		
So	5.268			10.680		
H ₂ O	2.365			2.604		

*Sample dried at 100° C. and remainder of water determined at 250° C.

The figures in I. represent the average of nearly a one year's run; in II. a three months' run in the same refinery.

In the formation of these residues the anodes contribute all their contents in silver, gold, selenium and tellurium. From any one of these elements we are, therefore, enabled to compute their degree of concentration in the residues, and to figure the amount of partial deposition therein of the other elements.

Since silver constitutes by far the greatest quantity, and consequently its determination being the most accurate, it is best to proceed from it. We then have:

Residues.	I. Anode copper.	Concentration.	Residues.	II. Anode copper.	Concentration.
Ag	.157187	100.1	Ag	.1608505	100.47

Dividing the percentages in residues of partially deposited elements by the figures for concentration, we obtain the percentages of the original quantity in the anodes deposited in the residues. The difference between this and the total contents in the anodes is the amount gone into solution in the electrolyte. From the latter, practically all the copper dissolved from the anode is deposited on the cathode, carrying with it but a few per cent. of the impurities in solution.

Proceeding according to the above, we obtain the following:

	I. Amount of original contents in anodes gone into residue and solution.			II. Amount of original contents in anodes gone into residue and solution.		
	Contents of anodes. Per cent.	In residue. Per cent.	In solution. Per cent.	Contents of anodes. Per cent.	In residue. Per cent.	In solution. Per cent.
Cu	99.3	0.07	99.93	99.4	0.686	99.914
Bi	0.0320	78.22	21.78	0.0035	60.71	39.29
Sb	0.0551	61.14	38.86	0.0510	29.90	70.10
As	0.0586	22.90	77.10	0.0180	37.84	62.16

Lead is not considered in these figures, because lead-lined tanks and lead sulphate, carried by the commercial sulphuric acid employed, render the obtaining of correct results impossible.

There is little similarity between the compositions of I. and II. In I the quantities of bismuth, antimony, and arsenic in the anodes are not very widely different. Bismuth shows the least solubility, arsenic the greatest. In II, where antimony greatly preponderates in the anodes, that element also shows the greatest solubility.

The ratio of selenium and tellurium in the two samples of residues may be worthy of notice. We have for I., 1 : 3; for II., 7 : 9. The current opinion, that selenium is merely a minor companion-element to tellurium in our western copper, seems thereby proven to be erroneous.

The ratio of the two elements in the anode copper is without doubt the same, and as they have never been separated from copper for quantitative determination individually, it can readily be shown by dividing their per-

centages in the residues by the figure of concentration what their quantities are in the corresponding anodes. We find:

	IN ANODES.	
	I. Per cent.	II. Per cent.
Se	0.00251	0.00419
Te	0.00748	0.00558
Total	0.00999	0.01007

The total of the two elements thus calculated, 0.00999% for I., corresponds closely with the actual amount, 0.0098%, found in the anodes. For II. no direct determination was made in the anodes.

A MODIFIED METHOD OF FINE SILVER ASSAY.

In the *Journal of the American Chemical Society*, October, 1897, XIX., No. 10, p. 814, Augustus E. Knorr says that in the government assay offices and in the laboratories of silver refineries the assay of fine silver is usually performed according to the method of Gay-Lussac. Two solutions are required, a standard solution of sodium chloride, 100 c. c. of which will very nearly precipitate 1 g. of pure silver, and a second solution, the exact decimal of the former, by means of which the titration is carried to an end. The quantity of fine silver weighed for assay is so adjusted that it will contain 1 or 2 m.g. over 1 g. of pure silver, a preliminary fine assay being made, if necessary, in order to determine the exact quantity to be taken. It is dissolved in nitric acid, 100 c. c. of the standard solution of salt are added and by vigorous shaking the precipitate is caused to collect. In the clear solution the excess of silver is precipitated by means of the decimal solution, added 1 c. c. at a time, and shaken before each addition in order to observe the cloudiness produced. Fractions of 1 c. c. are estimated by the depth of cloudiness on the last addition of decimal solution causing a perceptible precipitation.

This tentative method, though accurate, is apt to be tedious, much time being consumed if the fineness of the silver is not known within 0.002 to 0.003. About three minutes' shaking is required in order to obtain a perfectly clear solution, which is very irksome if there is no mechanical agitator at the operator's disposal.

For some time a modification of this method, largely obviating the shaking, has been used, and found both speedy and accurate. Instead of making the final titration with the decimal solution of sodium chloride, it is titrated with potassium thiocyanate according to the method of Volhard, using a ferric salt as an indicator. The standard solution employed is the same as in the original method, variations due to temperature and evaporation being eliminated by running a proof of pure silver with each daily set of assays. The solution of potassium thiocyanate is not an exact decimal of the first, but is standardized against pure silver so that 1 c. c. will precipitate exactly 1 mg. of silver. A correction for this solution is not required, since, in this dilution possible variations would fall beyond the limit of accuracy, which is placed at 0.2 to 0.3 mg. Results are stated in milligrams of silver per 1,000.

In performing the assay exactly one gram of the sample is weighed into a well-annealed bottle (8 oz.) fitted with an accurately ground stopper; nitric acid, diluted with about two volumes of water free from chlorine, is added, and solution hastened by placing on a hot iron plate. Heating should be continued until the last traces of nitrous acid have been expelled, which would otherwise interfere with the accuracy of the method. Two proofs of pure silver are weighed and dissolved in the same manner; it is not necessary to weigh an exact gram, but the actual weight taken should be accurately ascertained.

When the nitrous fumes have disappeared enough water is added to prevent crystallizing of the silver nitrate, and 100 c. c. of standard salt solution, delivered with great accuracy from an automatic pipette, is run into each assay. The stopper is inserted and the solution shaken until the silver has collected, when it is filtered, 5 c.c. of a solution of ferric ammoniac alum added, and the thiocyanate solution run in from a burette until the characteristic color of ferric thiocyanate no longer disappears. The titration should be performed in the cold.

Suppose, for instance, that 1001.3 mg. of pure silver had been taken for a proof and 8.4 c. c. of thiocyanate (equal to 8.4 mg. silver) had been required, then the titer of the salt solution is 1001.3 - 8.4 = 992.9. The standard of the salt solution having thus been obtained from the average of two proofs, the fineness of the assays is found by adding the number of cubic centimeters of thiocyanate solution required to the standard found.

Copper and other impurities liable to be found in fine silver do not interfere with the accuracy of this method. It is necessary to separate the silver chloride by filtration, because it slowly decomposes silver thiocyanate, and the wash water must be free from chlorine. Mr. Knorr says he has repeatedly tested this method and found it accurate.

Effect of Cold Upon Flexibility of Steel.—Some interesting experiments to ascertain the influence of cold upon the bending properties of wrought iron, Siemens-Martin open-hearth steel, Thomas steel, spring and cast steel, have been made by Prof. M. Rudeloff, director of the Imperial German testing station, says the *Engineer*. The samples were rounded off on the edges; the tests were made in a press. Cooling down to -20° C. exercised but little influence upon the flexibility of the different materials tested. Only in the case of spring steel and forged iron a reduction of the bending angle was observed, from 91° to 84° with the former, and from 150° to 139° with the latter, while the other samples could be bent together at -20° C. as well as at ordinary room temperature, so that the two shanks covered each other, equaling a bending angle of 180°. The flexibility was in some cases at -20° C. even higher than at ordinary temperature, only in the case of Siemens-Martin and Thomas steel it declined from 100 to 80. The samples showed at the bending place no change in the material that might have been caused by the cooling down to -20° C. A cooling to -80° C. had likewise very little influence upon the flexibility of soft rivet iron and rolled puddled iron, but the flexibility of the other materials suffered by the lower temperature, especially cast and spring steel.

THE PROPOSED CANAL OUTLET FOR THE BIRMINGHAM DISTRICT.

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

The project for connecting the Black Warrior River with the Birmingham District by canal was originated by the Hon. T. H. Aldrich, who saw the advantages of a water-way for the transportation of the products of that district to Mobile. It was brought prominently to the attention of the public by J. A. Van Hoose, Mayor of Birmingham, early in 1896, when he commissioned Messrs. John A. Milner and Julian Kendrick to make a report on the practicability of the project. This report was submitted February 27th, 1896, and briefly stated that two routes had been examined, the first being from a point on Five Mile Creek, where the waters of that creek could be turned into Village Creek near North Birmingham, thence down Village Creek to its junction with the Warrior River. The distance by this line would be about 27 miles.

The second route proposed, shown by the dotted line on the accompanying map, begins at about the same point as in the first route, then follows down the Village Creek Valley to a point nearly opposite the Thomas furnaces, where it cuts through the divide to the Possum Valley, thence follows down Possum Valley to Valley Creek, and follows that stream to its junction with the Warrior River. The distance by this route would be about 40 miles.

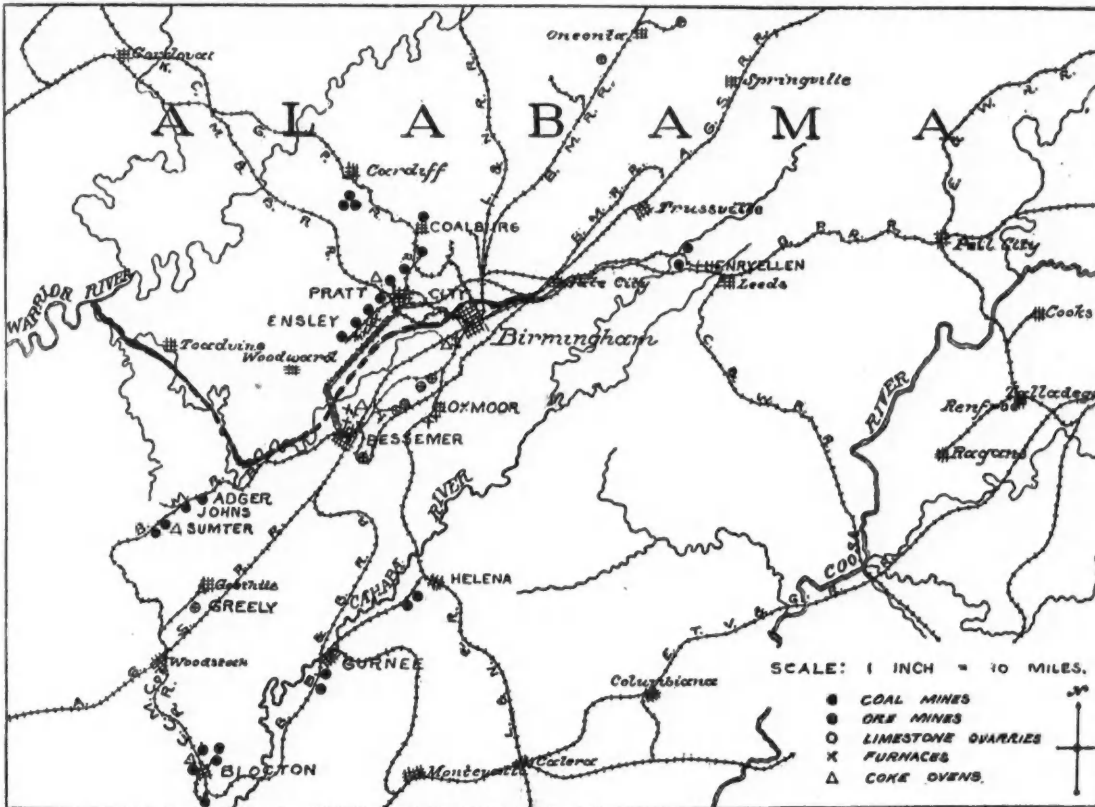
The report suggested that while the first route is shorter, it would not serve as many furnaces and mines as the second, which passes almost by

NOTES ON THE MANUFACTURE AND PROPERTIES OF BLAST FURNACE SLAG CEMENT.

Written for the Engineering and Mining Journal by A. D. Elbers.

Under the above caption the September number of the *Revue Universelle Des Mines* brings an essay of 60 pages by Henri Dètienne, a member of the engineering staff of the Société John Cockerill, at Seraing, in Belgium. The essay is well written. It contrasts favorably with the jumbled and unwarranted statements on the same subject which were editorially criticised in the *Engineering and Mining Journal* of June 1st, 1895, and still more so with certain other outgivings on this subject.

The slag cement, which Mr. Dètienne describes, consists of granulated basic slag, which has been heated to dryness and then ground fine, in admixture with, say, from 15 to 20% of fat dry-slaked lime. The basic slag is considered suitable for this purpose when it has its essential constituents within the following limits: $SiO_2 = 27\% - 32\%$, $Al_2O_3 = 12\% - 22\%$, $CaO = 49\% - 55\%$. The granulated slag is apt to give the best results when it has been dried by heating it to about $500^\circ C.$, or to a dark red heat, and this operation involves a consumption of coke amounting to about 9% of the weight of the dried slag. The comminution of the dried granulated slag requires from 25 to 30 H. P. for the production of from 450 to 800 kgs. of slag meal per hour. The slag meal is passed through a No. 80 metallic sieve (76 meshes to the linear inch) and is then so fine as to leave only from 10 to 12% residue on a sieve of 180 meshes to the



MAP OF BIRMINGHAM DISTRICT AND PROPOSED CANAL.

the door of many of the furnaces, and within two miles of 22 out of the 25 blast furnaces in Jefferson County. This route, the report suggested, would also pass within easy reach of a large majority of the coal mines of the county besides opening up for 15 miles a coal district which had now no means of transportation and is entirely undeveloped.

On the strength of this report a committee from Birmingham went to Washington and endeavored to get the necessary legislation through Congress with a sufficient appropriation to defray the expenses of a survey by the United States Engineers, and this was accomplished after some delay. The object of the survey is to ascertain whether it is possible to secure a channel having a minimum depth of 6 ft. and at least 50 ft. in width at the water line, and the probable cost of such improvement. The survey has already been begun by a corps of United States Engineers.

This project is of importance to the Birmingham district on account of the probable effect on freight rates to tidewater. At the present time the railroad companies transport coal for export to Mobile at the rate of \$1 per ton, and could reduce this rate if a direct line of road were constructed from Birmingham to Mobile. This would be secured by the building of the Mobile & Ohio road through Birmingham, or the extension of the Mobile & Birmingham Railroad from Selma to Birmingham. With the proposed canal and the improvements of the Black Warrior River completed, shipments could be made by water at a low rate.

Profits of the Witwatersrand Mines.—The returns of many of the important mines of Johannesburg show an increase in the profit of operation this year, which is due partly to the reduction in the cost of native labor which first began to be felt in June and a considerable increase in the grade of the ore, which was 38s. 4d. in January and 40s. 4d. in June. The reduction in wages is leading, however, to a diminution in the supply of native labor.

linear inch, and sometimes less than 8%. The lime is slaked by immersion, care being taken to have all superfluous water drop off, so that the slaked mass becomes thoroughly pulverulent. The slaked lime has to be kept stored from 8 to 10 days in order to render it so completely dry that it will pass easily through a No. 80 sieve, but as it usually still contains from 2 to 5% of incompletely calcined stone, it is first passed through a coarse screen.

After the raw materials have been thus prepared they are dry-mixed in suitable proportions, and the mixture is put up in bags and barrels, ready for use as blast furnace slag cement. Strictly speaking, this is not a cement, but a cement-mortar. From the very nature of its composition it becomes evident that its ultimate hardening properties must be inferior to those of Portland cement, or—for that matter—even to those of good natural cement such as Rosendale, and that its capacity of hardening under water must be inferior to those of Trass, Santorin and Puzzuolane, whereas its property of hardening in the dry state must be somewhat similar to that of common "air-mortar," using that term in contradistinction to "hydraulic." Nevertheless, it must be admitted that the system of manufacture which Mr. Dètienne advocates appears to be about the most perfect that can be devised for bringing out the best properties of a material that suffers from an insuperable defect, viz.: from the vitiating influence of its contents of soluble sulphides. As has been shown in previous articles, this influence can be overcome by proper treatment in the case of less basic slags, but these less basic slags have no setting properties and can only be used as "silicifiers," whereas those slags that are "setters" cannot be improved by the treatment referred to.

Mr. Dètienne disposes on page 277 of this sulphide question in the following manner: "As regards sulphides, the slag does contain some, especially when the furnace is working hot; the granulation decomposes a part of them, but the granulated slag as it is used in the manufacture of the cement still contains from 1 to 3% of sulphur in the state of MnS , $CaSO_4$ and CaS . It would seem that the CaS transforms itself by con-

tact with the water that is used in gauging the cement, and in presence of ferric oxide into calcium hydrate, under production of ferrous sulphide (FeS). It is this latter sulphide that imparts the greenish tint which is observed on the fractured surfaces of fresh briquettes that are made of blast furnace slag cement. In contact with the air the ferrous sulphide oxidizes and then the greenish tint of the fractures becomes bleached. There is no reason to fear deterioration on that account, because briquettes that are four years old have thus far not undergone the least alteration in volume or texture, in spite of the intensely greenish tint of their fractures."

Now, with all due respect for the objective manner in which Mr. Détéienne has treated the mechanical part of the process, it must be said that his chemical deductions, in regard to the behavior of the calcium-sulphide contents, are rather stunning.

The fact of the matter is, that the slag he speaks of contains the greater part of its sulphur in the form of calcium sulphide; that the granulated slag still contains several per cent. of the latter, even under the most favorable circumstances; that not one-twentieth part of these sulphide-contents can become transformed by the reactions that take place in gauging, or that result therefrom, inasmuch as these reactions are merely superficial, and that the dissolution of one-hundredth part of the contained calcium sulphide would suffice to impart to the cement-fracture that greenish tint which he assumes to be an indication that all of the CaS has transformed itself. Moreover, there is no reason why a briquette made of this sulphurous cement should have undergone any alteration in volume or texture on account of being four years old; but if it had been kept for that length of time under water, or if it had been frequently subjected during that time to varying atmospheric influences, then its strength would be found to have diminished with age.

It is, probably, for such reasons that the administration of public works (*des Ponts et Chaussées*) has thus far refused to accept blast-furnace slag cement (as Mr. Détéienne frankly states), and it is not likely that such a material will ever be mentioned in the specifications of any constructor who is competent to judge of its chemical properties. On the other hand, such cement is apt to find its way readily into almost any kind of structure in a surreptitious manner as an adulterant of Portland cement, and in that way it is apt to do frequently more harm than if it were used knowingly.

Of the many interesting experiments which Mr. Détéienne recounts in his essay, I only mention the results obtained by admixing blast-furnace slag cement with small quantities of soda. The time of setting is thereby considerably reduced, and the rapidity of the setting increases—within a range of from 1% to 2½%—in proportion to the quantity of the admixture. In practice it is found that an admixture of from 1¼% to 1½% of Na₂CO₃ gives the best results.

Whatever fault may be found with some of Mr. Détéienne's conclusions on the general merits of the described manufacture, it must be admitted that he presents most of the facts and arguments in such an open manner that no one who is conversant with the chemistry of cements can be misled by them.

A CHEAP CYANIDE PLANT.

A writer in the *New Zealand Mining Standard* gives the following account of a cheap cyanide plant from which satisfactory results were obtained. It may contain some hints to those who wish to apply the cyanide process in inaccessible localities or have a small accumulation of tailings which do not warrant the erection of an expensive plant. It should not be forgotten, however, that much of the disaster attending the introduction of the cyanide process in the United States was due to the assertions of its promoters that all that was required for its application were a few old tubs and barrels, and it is probably only under exceptionally favorable conditions, as there were very likely at this New Zealand plant, that success would be expected reasonably with any such equipment.

The lots of tailings to be leached were from an arrastra, and extremely slimy, fully two-thirds being clean slimes. As any heavy pressure would pack such material, the vats were built very shallow, being 2 ft. deep and 12 ft. square. The first solution was added slowly from the bottom, and, care having been used in putting the material into the vat lightly, without tamping, but little tendency to settle was found as long as the surface of the solution or wash water did not fall below the level of the top of the tailings in the vat.

The small amount of material in sight to be handled would not justify the purchase of expensive tanks, especially since an exceptionally large amount of leaching surface was required, owing both to the shallowness of the leaching and its extreme slowness in this slimy material. A cheaper method of building vats had, therefore, to be found, and, after a few experiments, the following was adopted: A row of seven boxes, 2 ft. deep and 12 ft. square, braced from the outside every 4 ft., was built, surfaced with lumber, 1½-in. stuff being used throughout, but no extra precaution being taken in the construction beyond thorough nailing. Over the cracks strips of canvas 3 in. wide were laid on top of a streak of hot (but not boiled) asphalt. A sheet of canvas of medium weight, 16 ft. square, sewed with double seams, was then laid down in the vat and folded up in the corners, the side next the board being covered with a good layer of hot asphalt just as it was laid, causing it to stick fast to the wood throughout. The upper edges were tacked to the vat—no other tacks being put through the canvas. The inside of the canvas lining was then thoroughly asphalted, with special care about the corners. The vat floor inclined 1½ in. in 12 ft., both east and north. In the northeast corner, 1 ft. from sides, the floor had been cut ¼ in. deep in a saucer-shaped depression, and a hole for a 1½-in. pipe bored. This was put in through a hole in the canvas and bolted tight in hot asphalt with 3-in. washers on the canvas and on the plank below.

Filters were of double burlap on 1-in. square strips, 1 in. apart, laid diagonally on the canvas bottom to within 6 in. of the sides—these held in place by canvas strips tacked across. Four strips 1 × 4 × 11 ft. 6 in., cut at 45° angle on corners, were laid around the bottom of the vat, a small roll of burlap being tacked to the thin under side, which stuck to the still warm asphalt. To these strips was fastened the burlap filter.

The outlet pipe was bent at right angles 3 in. below the vat. A short piece of hose was wired on it, and into the end of the hose was pushed a wooden spigot, which drained directly into a 2 × 4-in. launder running alongside the vats to the zinc-house. This launder was lined with a strip of asphalted canvas, and covered tightly except at the spigots. The same method of preventing leakage by means of asphalt and canvas was used in the construction of zinc boxes and solution tanks, the latter being built on the same general plan as the vats.

The pumping from sump tank to old solution tank was done by a small-sized Pelton motor, so set that the waste water from it could be used in leaching. Solutions were carried to the vats from the tanks by means of rubber hose.

With proper care, however, in the use of well-seasoned timber and good grade of asphalt, these vats lasted very well. A leak is easily mended by a new coat of asphalt, and this should be applied every four or six weeks as a precautionary measure. The tanks and vats have given excellent service, and are now being used to leach tailings from a five-stamp mill since built on the ground.

CALCULATING THE CALORIFIC POWER OF COALS.

H. von Jüptner in *Oesterreich Zeitschrift Berg-und Huttenwesen* XLV., 34, says that in the large series of analyses and determinations of the calorific value of American coals, given by N. W. Lord and F. Haas, the Dulong formula

$$p = 8,080 C + 34,462 (H - \frac{1}{8} O + 2,250 S)$$

was used for calculation and gave concordant results. The author has devised a simple method, capable of rapid performance, for ascertaining the calorific power of coals, with a very approximate degree of accuracy. After determining the percentage of moisture, W, the gas-producing power, G, the fixed carbon, K, and the ash, A, of the sample in a crucible, the amount of oxygen, S, required is ascertained by the Berthier test, and it may then be reckoned that the amount of oxygen required for the combustion of the coke carbon is

$$S = \frac{8}{3} K;$$

that needed for the combustion of gaseous distillation products is

$$S'' = S - S_1 = S - \frac{8}{3} K_1;$$

the ratio of the oxygen requirements of the volatile matters to those of the carbon coke are

$$\frac{S''}{S} = \frac{S - \frac{8}{3} K_1}{\frac{8}{3} K} = \frac{S - K_1}{K}$$

The heat of combustion of the coke carbon is set at 8,000 C., while the variable heat of combustion of the oxygen necessary to consume the gaseous distillation products may be designated as C. Consequently the calorific power of the fuel is:

$$p = 80 K + C \frac{S''}{100}$$

The values of C for hard coals are as follows:

S''	C.	S''	C.	S''	C.	S''	C.	S''	C.
S''		S''		S''		S''		S''	
02	4,000	06	3,400	10	3,250	30	3,180	50	3,130
03	4,000	07	3,340	15	3,224	35	3,170	55	3,120
04	4,000	08	3,300	20	3,210	40	3,150	60	3,110
05	3,550	09	3,270	25	3,200	45	3,140	65	3,080
								70	3,070
								75	3,060
								80	3,050

The heat of combustion of sulphur is set at 2,500 C. The application of this method in the case of the American analyses referred to, furnished results agreeing to within ± 3.5% of the total number of calories determined with the Mahler bomb, a concordance regarded as sufficient for practical purposes. In addition, the method presents the advantage of rendering possible the determination of the gases evolved during the dry distillation of the coal, and so facilitating the estimation of the value and nature of the fuel.

Ore Dressing in Cornwall.—We have recently referred to the introduction of the Bilharz table at the Dolcoath works. This seems to have attracted the attention of the American makers of the Frue vanner. They have offered to put in two tables at Dolcoath at their own cost, the mine supplying motive power, which the Dolcoath people have willingly agreed to.

Smelting Tungsten Ore.—In *Comptes Rendus* M. Defacqz describes experiments on the reduction of tungsten ores by charcoal in the electric furnace. He mixed wolframite from Zinnwaid containing 72% WO₃, 5% F.O. 16% Mn₂O₄ and 2% CaO, with 14% of sugar carbon, and subjected the mixture to a current of 1,000 amperes and 50 volts. In 12 minutes there was obtained a regulus containing 92% of tungsten.

The German Chemical Industry.—At the annual congress of the German Society for the Protection of the Interests of Chemical Industry, at Baden-Baden, the president, Dr. Holtz, stated that in 1896 the output of chemical products increased by 8.7%; the average number of workmen employed by 5.2%, and the total amount paid in wages from 103,400,000 to 113,700,000 marks, or from 894 to 907 marks per head. The exports increased by 6.5% in value and by 13% in quantity. As a consequence of the general fall in prices, there was a reduction in the average net profits (as shown in the reports of the principal chemical companies), from 12.71 to 12.3%.

Aluminum Bronze Mixtures.—The use of aluminum bronze is increasing for purposes where a strong and dense metal is required, says the *Aluminum World*. The amount of aluminum in aluminum bronze varies from a few per cent. up to 10 or 11%, depending on the purpose for which the metal is intended. The strongest mixture contains between 10 and 11% of aluminum. Beyond this point the bronze is hard to work and becomes brittle. Aluminum bronze can readily be soldered. In soldering this alloy no such difficulty is encountered as is found in soldering pure aluminum. The best method of soldering aluminum bronze is to use pure block tin with a flux made from zinc filings and muriatic acid. It is well to "tin" the two surfaces before putting them together.

MICROSCOPICAL EXAMINATION OF IRON AND STEEL.—IV.*

Written for the Engineering and Mining Journal by Albert Sauveur.

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DEVELOPMENT OF THE POLISHED SURFACES.

Necessity of Developing the Structure.—As stated in a previous article, unless the polished sample is made up of constituents differing much in hardness and has been polished in relief, the microscope will reveal little, if anything, of its microstructure. All the constituents cut through precisely the same level, being equally bright, present a similar appearance and cannot, therefore, be distinguished from each other. If examined by oblique reflected light, the bright, specular surface will reflect the totality of the light outside the objective, and the specimen will appear uniformly dark. If direct reflected light be used, all the rays will be reflected back into the objective, and the object will appear equally bright all over the field.

It is, therefore, necessary to differentiate the various structural components, that is, to impart to them unlike appearances and in this way make them distinguishable under the microscope. The various methods of accomplishing this will be described separately.

Importance of a good Development.—It is of the utmost importance to properly develop the structure and especially to avoid introducing into the image of the specimen any appearance which is not due to the structure of the metal—too much stress could not be laid upon this point. While an experienced eye will readily detect such markings as are caused by a defective development, they are very confusing to the novice and liable to lead him to erroneous deductions, besides being a constant source of discouragement. After a little experience, however, and by following the methods recommended further on, one should rarely fail to secure good results.

The structure of a well-developed specimen should appear clear and sharp, the joints between the grains or crystals should be well defined, the lines of demarcations between adjacent constituents clearly brought out. Too prolonged or too intense a development will blur, so to speak, the delicate joints and fine outlines; while too short or too weak a treatment will bring them out only partially and faintly. A properly conducted development is always a source of delight, at once convincing of the great possibilities of the microscope in the domains of the physics of metals.

Development by Etching.—This method, almost exclusively used, consists in treating the polished surface with some chemical reagent which will attach certain constituents, to the exclusion of others or with various degrees of intensity, or which will color them differently (generally through the formation of some colored film or through some deposit, in the case of salts), in this way differentiating them.

As remarked by Mr. Osmond, the reagents available may be divided into three classes: 1, acids; 2, Halogens, and 3, salts.

The Rationale of Acid Development.—The action of acids upon the principal structural constituents of iron and steel may be broadly described as follows:

Carbonless iron (ferrite) is acted upon uniformly, through a dissolving action; it loses much of its metallic luster, but remains light. The joints between the grains are somewhat dug out by the acid and appear like fine, dark lines through the microscope, forming a delicate network upon a white background.

The carbide Fe_3C (cementite) is left unaltered, for it is well known that cold acids have no action upon this component. It retains all its specular appearance even after prolonged treatment.

The composite constituent (pearlyte) which is an intimate mechanical mixture of the former two, being made up of extremely thin parallel plates alternately of ferrite and of cementite, exhibits after etching a beautiful play of color, very suggestive of mother of pearl. The phenomenon is similar to that of diffraction produced by gratings. The plates of ferrite are somewhat darkened (or rather deprived of their metallic luster), while the cementite plates are left white and brilliant and standing slightly in relief. When it is remembered that the striae seldom exceed $\frac{1}{1000}$ of an inch in thickness, it will be seen that this remarkable constituent presents an arrangement similar to that of the reflection gratings of physicists.

Martensite, a component to be found only in hardened steel, is also deprived of its specular appearance by the acid bath, and reveals, after etching, an intricate and often confused structure, which even the highest powers fail to resolve satisfactorily. It sometimes assumes a yellowish tint. As the condition in which the carbon is present in martensite has not yet been conclusively shown, an attempt to account for the action of the acid upon this constituent would be mere speculation. We know, however, that the hardening carbon (whatever that is) is included in the martensite, and since hardening carbon is dissolved by cold acids, it is safe to assume that the bath exerts a dissolving action upon martensite, but as it has not by any means been established that this component is not, like pearlyte, a composite one, it cannot be said that such action takes place uniformly over the whole surface of the martensite, for if it is made up of two constituents, they are in all probability affected differently by the acid.

Graphite remains, of course, unaltered, retaining its dull black appearance, and slag is probably little affected by such short immersions in acids.

Etching with dilute nitric acid.—The strength of the acid may vary all the way from 1 part acid (1.42 sp. gr.) in 50 parts of water to 1 part acid in 1,000 parts of water, depending somewhat on the nature of the specimen, but mostly on the preference of each operator. It is difficult to formulate any rule with regard to the most desirable degree of dilution. While it may be argued that a very dilute solution, on account of its slow action, should bring out more clearly the most delicate details of the structure, it is also true that it induces to a greater degree the forma-

tion of an objectionable colored film, of which more will be said in a subsequent paragraph.

One part of acid in from 100 to 500 parts of water is probably the best proportion. The acidulated water is poured in a dish and the specimen, which should be carefully cleaned and freed from finger marks, is promptly immersed. The polished surface soon loses some of its mirror-like appearance, increasing in dullness as the action is prolonged. After a little practice it will be possible, in most cases, to judge with the naked eye when the specimen has been sufficiently etched, but the novice must examine it through the microscope after each immersion of 10 seconds or so until the structure has been properly developed. The metal is then quickly washed, first in water, then in a solution of water and alcohol (equal parts), and dried with a piece of soft linen, or better still, under a blast jet if such be at hand.

It is sometimes a matter of considerable difficulty to obtain a very uniform etching by this method. Local actions are generated which cause the specimen to be etched more deeply in places, while the formation of a colored film of oxide is very frequent and most objectionable. In order to remove the latter, Professor Arnold recommends soaking the piece for a few minutes in a bath of benzole immediately after the acid treatment. It loosens the film, which is then removed by rubbing the specimen gently, a few times, upon a piece of soft chamois leather. The suggestion is a good one, but in some cases the film adheres so firmly in places that even this treatment fails to remove it entirely.

Etching with Concentrated Nitric Acid.—The unreliability and other shortcomings of the treatment with dilute acid led the writer, long ago, to discard it and to adopt the following method:

The polished sample, suitably held, is dipped into concentrated nitric acid (1.42 sp. gr.), which on account of the passivity of iron has little or no action on the polished surface. The specimen is then placed under an abundant stream of running water, and the acid is quickly and completely washed off. As soon as the layer of concentrated acid which covers the surface is diluted by the running water, it attacks the steel, at first vigorously, but for such a very short time (since the water soon removes all trace of acid) that there is no danger of etching too deeply.

Such treatment develops the structure sharply and clearly, the etching



FIG. 5.—WHITE CAST IRON ETCHED WITH CONCENTRATED NITRIC ACID. (Magnified 56 diameters.)

being of uniform intensity all over the surface and free from the objectionable colored film and from the unlike appearance of different parts of the field, caused by local actions of varying intensity, which are so troublesome and misleading in etchings with dilute acid. Fig. 5 shows the structure of a sample of white cast iron, etched with strong nitric acid and magnified 56 diameters.

It is sometimes necessary to repeat the treatment in order to develop the structure to the proper depth, but more than two immersions are seldom required. The specimen is washed in water and alcohol and quickly dried with a soft cloth or under a blast jet.

The fact that the specimen after having been immersed in concentrated nitric acid is attacked by contact with diluted acid might at first occasion some surprise. It must be remembered, however, that while after such an immersion iron assumes the passive state in such a way that upon being transferred into a diluted solution no action takes place, nevertheless, the condition thus brought about is very unstable. A shock will generally suffice to start up activity. If some drillings of iron are dipped into strong nitric acid and then placed in dilute acid, the passive state is preserved, but upon striking the drillings with a glass rod, activity is restored and the iron is attacked with the usual energy. In the method of etching just described, the stream of water falling with considerable force upon the passive iron produces in all probability a similar effect.

Etching with other Acids.—Many other acids may of course be used to produce a superficial attack of the polished surface, such as hydrochloric acid (with or without the assistance of galvanic action), sulphuric acids, oxalic and citric acids, chromic acid (Abel's reagent), etc. They should generally be considerably diluted. None of them, however, have so far yielded as good results as nitric acid.

Professor Martens recommends an etching solution made up of hydrochloric or nitric acid, ether and alcohol. As far as the writer has been able to ascertain, no advantage is to be gained from the use of this mixture. The same author also advocates another method, which he describes as follows:

"Etching is usually accompanied by alterations of color, either because certain colored elements in a component of the surface are insoluble in the etching fluid and, by remaining undisturbed, color the entire component in that surface; or because compounds are formed between the loosened

* No. I. of this series appeared in the *Engineering and Mining Journal* for June 11th, 1897, page 662; No. II., July 17th, 1897, page 69; No. III., August 21st, 1897, page 215.

particles and the etching fluid, which, on account of their insolubility in the fluid, adhere more or less firmly at the point where they originate. The attempt will frequently be made to fix these colored coatings artificially, either by making such additions to the etching reagent as will promote the adhesion of the coloring particles, or by carefully transferring the object from one bath to another, the last always displacing the solution of the preceding one and preparing the object for the next, until finally a solution is reached in which the fixative for the colored coating is precipitated. By such successive immersions one may pass, for example, from water through alcohol and ether to a solution of Canada balsam in chloroform; and, upon the evaporation of the latter, a thin film of the Canada balsam fastens the pulverulent colored precipitate. If the etching reagent produces colored compounds soluble in water, and on that account the attempt fails to color the particles of the object from which those compounds are derived, experiments should be made with the same reagent in other solutions, such as alcohol, ether, benzine, etc."

The retention of such colored films can at best be accomplished in a very uncertain and imperfect way, and on that account their presence is generally decidedly objectionable and misleading. Instead of devising skillful methods in order to retain them, it seems a much better plan to employ one's ingenuity in effecting their removal (and for that purpose Professor Arnold's benzole bath is very effective), or better still, to prevent their formation altogether through a rapid etching with concentrated nitric acid.

Etching with Halogens—Tincture of Iodine.—Iodine in the form of a tincture is the only halogen which can conveniently be used. It was first applied by Mr. Osmond, and gives excellent results. The etching is conducted as follows: Upon the polished surface pour a drop or two (Mr. Osmond recommends one drop per square centimeter) of ordinary tincture of iodine, and let the solution act until it is discolored. Wash in alcohol and dry quickly with a soft cloth or under a blast jet. The writer prefers to use a solution diluted with alcohol, in the proportion of one volume of tincture to one of alcohol. Two or more applications are sometimes required before the specimen is sufficiently etched.

Etching with Salts.—Salts, such as copper sulphate, bichloride of mercury, chloride of gold, double chloride of potassium and platinum, when brought in contact with the metallic surface, dissolve some of the iron, replacing it by a deposit of their own metal. At first such reagents would seem to offer great possibilities; they act, however, in a very uncertain way, and so far have not given satisfactory results. While experimenting with sulphate of copper the writer has obtained sporadically some beautiful developments, which he was then unable to duplicate, although repeating the treatment under apparently identical conditions. The method, however, is well worth further investigation.

Osmond's Combined Polishing and Etching.—Mr. Osmond finds that the structure of the polished sample can be made apparent by "adding to the mechanical action of the chemically inert polishing powder, that of a liquid reagent which would be inert by itself, but whose activity is excited by rubbing." Oddly enough, the reagent which he found most effective in this connection consists of an infusion of licorice roots. The effect of the treatment is to color some of the constituents to the exclusion of others, or before them, in such a way that no two components assume the same color at the same time, the harder always keeping in advance of the softer one.

Heat as a Developer.—If a polished piece of iron or steel, suitably held, be heated (conveniently over a Bunsen flame), the different constituents assume, in rapid succession but with various velocities, all the tempering shades—dark blue, light blue, brown, yellow, etc.—here again the harder constituent generally keeping ahead of the softer one in this ascending color scale.

Specimens developed in this way often constitute objects of great beauty under the microscope. The method, however, is somewhat uncertain and cannot be applied to samples of quenched steel, for it is a regular tempering process which will alter the structure of such specimens.

Etching at a Red Heat.—Mr. Saniter has very recently succeeded in etching some metallic preparations at a bright red heat. His purpose was to ascertain the structure of the metal at a high temperature, with a view of throwing additional light on the phenomenon of hardening. He used for that purpose calcium chloride, a salt which fuses readily at a red heat. A sufficient amount of it is melted in a platinum crucible over a blast lamp, and when it has reached a bright red heat the polished sample is promptly immersed and kept in the bath until it has attained the same temperature. After heating 15 seconds longer the crucible is rapidly cooled by dipping the bottom into cold water.

The specimen is then quickly dissolved out in water and dried with alcohol. Calcium chloride, Mr. Saniter finds, exerts a selective action upon the various constituents and, therefore, reveals the structure. Mr. Saniter argues that the structure made apparent in this way is the structure possessed by the metal at a bright red heat, and, everything considered, the writer is inclined to believe that such is the case. But this implies that the metal did not undergo any structural modification during the rapid cooling of the crucible, for if it had the character of the etched surface would have changed correspondingly and, therefore, would no longer represent the structure at a red heat. In other words, it implies that the structure of quenched steel is identical to the structure it possessed at the quenching temperature, and, if such be the case, such structure can be revealed more conveniently by etching the quenched specimen—nothing is to be gained by etching it at a high temperature. Of course, calcium chloride cannot then be used, and for that reason the appearance of the two etchings (a calcium chloride etching at a red heat and an acid etching of the quenched sample) may not be identical, but they should have the same general character. Mr. Saniter's experiments, however, are suggestive and may yield valuable results.

A Vanadium-bearing Iron Ore from South Africa is mentioned by F. W. Daw in *Chemical News*, September 17th, 1897. The analysis was: SiO_2 , 0.99; Al_2O_3 , 2.06; Fe_2O_3 , 72.85; FeO , 5.24; MnO , 0.20; CaO , 0.40; MgO , 0.54; TiO_2 , 15.00; V_2O_5 , 0.59; NiO , 0.30; Cr_2O_3 , 0.26; combined H_2O , 0.37; moisture, 0.58; phosphorus, nil; sulphur, trace; arsenic, nil; total, 100.38. In the same issue W. B. Giles points out that vanadium frequently occurs in rutile. St. Claire Deville found 0.323% of vanadic acid and 0.486% of molybdic acid in rutile from Saint Yrieix.

A HUNGARIAN MINE-LEVELING INSTRUMENT.

O. Cseti, in *Berg- und Hüttenmännische Zeitung*, Vol. LIV., p. 391, describes an instrument of his design with which accurate leveling operations may be carried out underground with equal facility in steep and narrow inclined shafts and in adit levels.

It consists of a spirit level screwed on a good telescope, the whole being fastened by collars to a rod hanging from the station point. The telescope is provided with a diagonal eye-piece for convenience of sighting when the eye-piece comes so close to the wall of the drift that direct sighting is not possible. A screw serves to clamp the instrument to the rod at any height. The iron hanging rod is 5 ft. long, 0.67 in. square in section and hollow. From the top downward it is graduated in centimeters, while a vernier fixed to the leveling instrument renders it possible to determine the distance between the station point in the roof and the line of sight. A weight keeps the rod vertical, and a second rod slides inside it, and may be raised or lowered and clamped. At the base of the second rod is swiveled a two-pronged fork, which sticks into the floor and prevents the whole from swinging. The total weight of the apparatus is 10 lbs.

The leveling staff recommended is 20 in. long and 4½ in. wide, the scale being drawn in Indian ink on Whatman paper. The scale reads to 1 mm. and is placed between two sheets of glass enclosed in an iron frame fitted with a hook and an adjusting screw. When the scale is illuminated from the back the position of the horizontal wire of the telescope can be rapidly and accurately estimated to ½ mm. The weight of the leveling staff is 4½ lbs. The varying height of mine roadways necessitates the addition of four to six lengthening rods. These are made of 0.2-in. iron wire bent to an eye at each end. As a rule four rods 1 m. long and two rods of half that length are sufficient. With this instrument inclines can be leveled with rapidity and accuracy and adit levels may be leveled with three to four times the speed that is possible when the ordinary tripod stand is used.

Cinnabar in Alberta.—The discovery of a large deposit of cinnabar in this Province is reported.

Blue Rock Salt.—F. Krenz, in *Neues-Jahrbuch für Mineralogie*, 1897, I., Ref. 7, attributes the blue color of rock salt to presence of an iron compound (probably phosphate), although Wiedemann and Schmidt hold it to be due to sodium sub-chloride, Na_2Cl .

The Cement Industry in Michigan.—The Bronson Portland Cement Company, of Bronson, Mich., is increasing the capacity of its works to 1,000 barrels per day, which is about double the present capacity. This company has a modern plant with steel buildings and the largest rotary furnaces in the world.

Weight of the Witwatersrand Pyritic Conglomerate.—In a paper read before the South African Association of Engineers and Architects, August 25th, Mr. Franklin White stated that he had ascertained the volume of certain stopes which had yielded 50,000 tons of ore, and found the average to be 12 cu. ft. per ton of 2,000 lbs., and subsequently had tested specimens from numerous mines and found the average specific gravity to be 2.701, which is equivalent to a weight of 168.56 lbs. per cu. ft. or 11.96 cu. ft. per ton of 2,000 lbs. This is contrary to the ideas previously held, according to which in the absence of any specific determination 13 and sometimes 14 cu. ft. per ton have been taken as the factor. Probably much of our data of this nature is at fault, and it would be well if similar investigations were made in other districts. The difference between 12 and 14 cu. ft. per ton in estimating ore reserves is not inconsiderable.

Geological Survey of West Virginia.—The survey, as provided by the law passed last winter, is under control of a commission composed of the Governor, State Treasurer, President of the State University, Director of the State Agricultural Experiment Station and President of the State Board of Agriculture. The organization of the commission was recently effected by electing Gov. G. W. Atkinson, president; M. A. Kendall, treasurer, and T. C. Atkinson, secretary. The commission has appointed the following executive officers: Superintendent, Dr. I. C. White; first assistant geologist and curator of the collections, Prof. S. B. Brown; superintendent of biological division, J. H. Stewart; executive officer, Dr. J. H. Raymond. It has also ordered Professor Brown, who holds the chair of geology at the State University, to collect and prepare for publication a synopsis of all the works bearing on the geology and biology of West Virginia. It is thought the survey will take about 10 years. The legislature appropriated \$6,000 for 1897, and if succeeding legislatures approve, the survey will proceed until completed.

Gold in Nicaragua.—Consular Agent M. J. Clancy at Bluefields reports to the State Department that the recent decree levying a duty of \$1 (gold) an ounce on gold ingots and \$2 an ounce on gold dust exported from Nicaragua has disturbed owners of gold mines, and they are now preparing a petition to the government, giving reasons why the decree should be rescinded. The duty previously had been 80 centavos, or 35.4 c., United States currency, an ounce. The shipments of gold from Bluefields during the year ended June 30th, 1896, amounted to \$137,929 (United States). The shipments for the year ended June 30th, 1897, amounted to \$169,565, an increase of \$31,636. The increase would not seem to indicate any great addition to the machinery employed in eastern Nicaragua at the date of the last report, September, 1896. It is true that five or six of the mines in that section are quite valuable, and that there is strong probability of discovering others equally good. Some of the quartz specimens have been rich enough to interest United States capitalists, and five or six mining experts have visited the country during the last year.

A STEEL TRACK FOR COMMON ROADS.

SOME NOTES ON HYDRAULIC MINING.

Written for the Engineering and Mining Journal by Augustus J. Bowie.

The United States Department of Agriculture has taken much interest in the improvement of ordinary roads, and recently established a new bureau of Road Inquiry, the head of which is Gen. Roy Stone, of New York. Among other subjects which the Department has taken up has been the use of steel tracks on roads. Sample sections of such roads have already been built in New Brunswick, N. J., Geneva, N. Y., and New Lenox, Ill., and it is proposed to build others wherever practicable in connection with agricultural experiment stations and agricultural colleges. While the use of the steel trackway would probably be too expensive for ordinary roads running over long distances, it might be applied to much advantage in the neighborhood of many mines, where the haulage is heavy over a short distance.

Special interest was taken in the matter by the Cambria Iron Works, and in connection with the engineers of that company General Stone devised a form of track which it is believed possesses many advantages for the purpose. In the illustrations given herewith Fig. 1 is a cross-section of a macadamized road provided with the steel track; Fig. 2 is an elevation and Fig. 3 a section of the joint used, while Fig. 4 is a perspective view of a portion of the track with the joint. The track itself is an inverted channel, provided on one side with a small lip intended to serve as a guide for the wheels. The tread is 8 in. wide, about $\frac{1}{8}$ in. thick, and it weighs about 65 lbs. to the yard, so that about 100 tons per mile will be required. These rails are of a form which is easily and cheaply rolled; they are embedded in the gravel of the road as shown in Fig. 1 and are tied together at intervals to prevent their spreading. The joint is of somewhat peculiar form. The shoulders shown on the side are intended to serve a double purpose, stiffening the joint plate itself, and also furnishing an inclined way by which wagon wheels can be guided back to the track in case they have slipped off it. This is considered a point of some importance.

In practice with the small section already laid it has been found that

Since the decision of the debris suit in California hydraulic mining as formerly carried on in those regions tributary to the drainage basins of the Sacramento and San Joaquin rivers has practically ceased. The magnitude of the operations, and the high degree of development there attained, are most imperfectly known outside of the State. Few of the old engineers and superintendents of large works are now alive, and those who have entered the field since the debris injunction have had little opportunity of familiarizing themselves with the subject, being dependent for their experience on unimportant and desultory work. With the decline of this industry, a decline most disastrous to the interest of California, the number of experienced miners has become limited, a condition of affairs especially noticeable as the occasional discoveries in different parts of the world of deep placers or large areas susceptible of development by hydraulic methods have created a demand for competent men. Lack of familiarity with the geology of auriferous alluvions, and with the application of hydraulic methods to their economical working, have created a class of men who have endeavored to supply this deficiency. The apparent simplicity of the calculation of a specified yield per cubic yard, and the known duty of the miner's inch on a given grade, have, unfortunately, led many to consider the entire subject within their grasp, thus permitting the promotion of schemes based on preconceived ideas of hydraulic mining and of the regularity of the distribution of gold in placers.

Every auriferous alluvion* has its distinct characteristics and local peculiarities. Some deposits contain more or less soil, fine sands, clay strata, layers of pipe clay, streaks of conglomerated material and detritus, varying in size from small gravel to boulders of all dimensions, including erratics. In other instances banks are composed of a regular heavy water-worn wash of rounded stones like cobbles, ranging from

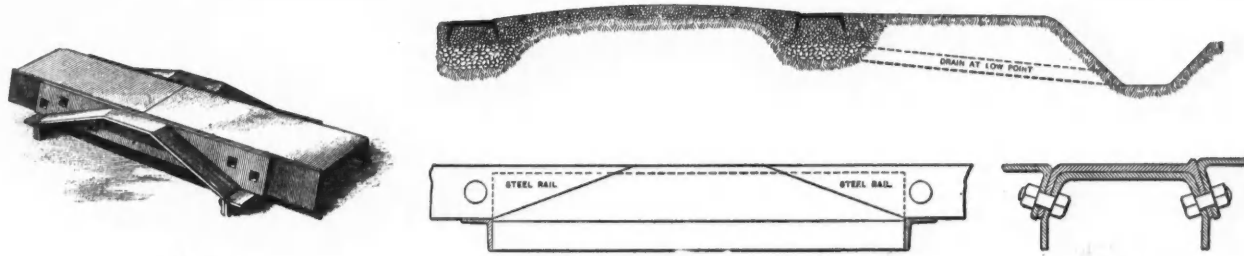


FIG. 4.

FIG. 2.

FIG. 3.

STEEL TRACK FOR COMMON ROADS.

little attention need be paid to the suggested objection that the rails would become buried in the mud in bad weather or would tip and become uneven. The cost is estimated at about \$3,500 per mile.

Manufacture of Phosphorus in the United States.—Works employing 300 H. P. have been put in operation recently at Niagara Falls for the manufacture of phosphorus by the Allbright process

Infusorial Earth in Germany.—At Schmarbeck, in Müden, a bed of infusorial earth has been discovered. It is said that the deposit can be easily worked, as in places the thickness of the overburden does not exceed a yard.

Lithographic Stone in New Caledonia.—*La Mine d'Or* announces the discovery of lithographic stone in New Caledonia. The stone, which has been met with in considerable quantity in the island of Mato, appears to be of good quality. It is of fine texture and light in color, and contains more than 80% of carbonate of lime.

Preparation and Properties of Fluorine.—Professor Meslans, an associate of Professor Moissan, in a paper read at the Toronto meeting of the British Association for the Advancement of Science, stated that fluorine may be prepared by the electrolysis of anhydrous hydrofluoric acid, containing acid potassium fluoride, in a copper vessel, surrounded with a freezing mixture. To free the gas from vapors of hydrofluoric acid it was passed through a copper coil surrounded with solid carbon dioxide and alcohol. In a paper by Messrs. Moissan and Dewar, which was also read, it was stated that the boiling point of liquid fluorine is -185 to -187° ; critical temperature, -118° ; critical pressure, 25 atmospheres, and density, 1. The gas liquefies in boiling air but not in boiling oxygen, and is soluble in liquid air.

Iron Smelting in Ireland.—The *Colliery Guardian* says that in the neighborhood of Drumkeerin, County Leitrim, bordering the shores of Lough Allen, a furnace is now in course of erection for smelting the native ore, and, so far as the preliminary trials have gone, the results have been reasonably satisfactory. The district is rich in minerals as compared with other parts of the island. The coal strata are the uppermost of the secondary deposits in the district, and are bedded on carboniferous limestone, which has for a base a tract of the old red sandstone. Beds of ironstone are numerous; limestone for smelting has been quarried here before, and charcoal is obtained from the neighboring woods. Nearly half a century ago ironworks were in operation here, but owing to the scarcity and unsuitability of fuel the smelting was discontinued, although the last iron made was of a high quality. To cope with this drawback, and to utilize turf fuel, a peat-drying and pressing plant has been laid down,

a few pounds to 800 or 1,000 lbs. or more. Such deposits are sometimes strongly cemented together with a mass of fine clay or sand mixed with quartz gravel, which now and then easily yield to the pipe, while others require the assistance of powder to shatter them before they can be moved or washed. Gold will not be looked for in the solid boulders, but will be obtained only from the fine material which holds them together. Therefore, a deposit composed principally of large boulders will not yield as much to the cubic yard as ground where the material is more evenly distributed. Its very existence is *prima facie* evidence that its origin was due to a strong flow of water and heavy grades, indicating in all probability that the gold has been swept forward and deposited on more gentle slopes where the current was not so swift. The official report of the yield per cubic yard of the gravel deposits worked in the Oural Mountains is the yield of the finer material taken from the deposits, and may be considered, when compared to the yield per cubic yard of hydraulic mines, in the same light as concentrates from any ore.

The specific gravity of gold causes it to concentrate more or less during the period of the formation of alluvions, and it may generally be considered that relatively the bulk of the precious metal lies on or near bedrock. Very fine particles of gold are disseminated to a limited extent through the top layers of detrital accumulations, which are frequently interspersed with masses of sand and pipe-clay covering the pay dirt. Under such conditions, if in deep gravel deposits the top masses were washed by themselves, the yield would vary largely from that of the bottom or lower stratum, and if the value of the claim were based on the yield of the bedrock stratum without any regard to the superincumbent material, the financial results would prove unsatisfactory.

The cubic yard in hydraulic mining has been adopted by engineers as a unit of measurement for the guidance of work, to which unit all matters connected with the receipts and disbursements of such enterprises are referred. This unit, when applied to the valuation of a claim, refers to the total contents of the volume of material included between the rim rocks (workable), taken from the surface to bedrock on the line of deposit; hence everything is included in that volume. Therefore, in judging of the economic value of the auriferous gravel deposits, their character must be studied, as the financial results from the hydraulic mining cannot be determined by merely ascertaining the contents of each section or layer shown in openings from the surface to bedrock without taking into consideration and definitely establishing the proportions which the various strata bear to each other as a whole, presupposing that all the other requirements for successful hydraulic mining be fully understood.

In auriferous gravels, gold is considered to be confined to the channel or line of wash in which they occur, varying from a few feet to several hundred feet in depth, so that, correctly speaking, the yield per linear foot of bedrock, taken across the channel, shows the value of the alluvions, the cubic contents on this cross-section necessarily varying with the nature and position of the bed rock, and the topography of the country, which figures as a factor when hydraulic mining. Therefore the expression that a mine will yield a given amount per cubic yard does not

* It is generally accepted that the auriferous gravel deposits of California have been laid down by the action of a system of Tertiary rivers.

mean literally that there is so much gold in each cubic yard where auriferous gravel may exist, but indicates the estimated or actual general average value of the ground in and along the channel area, worked down to bed rock. Expectations formed on any other basis, and without regard to the nature of the deposit, must necessarily meet with disappointment.

As a general proposition, hydraulic mining requires a larger investment of capital than any other class of mining before profitable results can be obtained, and every investor should consider this. The works once completed, the cost of maintenance is relatively small, and the yield comparatively large. The proper opening of a hydraulic mine, together with the attendant construction of ditches, flumes, pipe lines and sluices, should be intrusted to engineers. Business managers, however successful as men of affairs, cannot be expected without technical training to understand mining operations. There can be no division of authority in the development of such enterprises. One head must be responsible for success or failure, and no engineer should assume such a responsibility without having control of the work with the full confidence and support of the owners. The best matured plans should be carried out by the man who conceives them, or by one equally competent, else the work will prove a failure. To insure the success of such enterprises, capital must be supplied in accordance with the demand of the work; otherwise there can be no economy; the employees cannot be controlled, work languishes, expenses increase, the monthly balance sheets alarm the owner, and the operations come to a standstill. Owners at home cannot understand the obstacles and privations attendant on the development of the properties in remote and unsettled regions. Where good work is expected from the men, they must be properly housed and cared for, and skilled labor commands its price.

An estimate of monthly cost is frequently demanded in advance of the work, but the impossibility of giving such figures correctly must be apparent to anyone with the slightest experience. Expenses depend upon the daily varying condition of the work and the progress required. Although the rate per day is a known quantity, the character of the labor available is very uncertain. The receipt of supplies depends upon the locality, the season of the year and the condition of the roads. Contractors rarely fill their engagements, in many cases through no fault of their own, and unlooked for difficulties invariably occur. When the properties are once opened, and the work is progressing regularly, monthly estimates for maintenance can be readily furnished, independent of the yield. Parties interested in hydraulic properties and unfamiliar with their workings frequently figure for their own purposes upon the monthly yield of the washings in advance of the work being performed, assuming as a basis of their estimates, figures obtained from the engineers in charge of the value per cubic yard of the gravel, and the expected quantity of the water obtainable.

There are cases on record where mining men of long practical experience, presuming on their knowledge of this subject, have anticipated the clean-up and declared dividends, but the results have confounded their judgments, and the lesson taught has been a bitter one. The dangers and difficulties attendant on these estimates cannot be appreciated by those who, unacquainted with the business, calculate at their leisure the financial results like interest and figure returns as if coming from a blast furnace regularly charged, or the yield from silver mills where the daily average value of the ore worked is definitely known. A cursory view of the situation will make that apparent. The mere fact that a given number of inches of water under a stated head are used and a known number of cubic yards of material on a specified grade are washed, does not place it in the power of any one to state with certainty in advance the amount which will be obtained from monthly "clean-ups." Before attempting even conditionally to approximate the yield, the property should be thoroughly opened. It must not be taken for granted that when a pipe line is put in position for hydraulicking and a main sluice established all that is necessary is to turn on the water and work the ground. If such were the case, hydraulic mining would be a very simple proposition.

Apart from any engineering considerations, there are numerous conditions continually presenting themselves, to be met as they appear, but which cannot be foreseen. The season and the water supply, even with large reservoirs, are, under the most favorable circumstances, unreliable factors. This is due to the rain and snowfall, which vary yearly both as regards quantity and the time of precipitation. When the winter storms commence in November, or in the early part of December, the season's water supply is generally better than when they hold off until late in January or February. Storage reservoirs give a greater assurance of water than ditches drawing directly from running streams. When the latter afford a steady flow they are more economical than impounding works, but generally the flow of streams is irregular at the elevations where it is necessary to tap them in mining regions. Heavy snows and early rains, followed by warm weather, cause freshets, and the capacity of a ditch being limited, the water supply, which under favorable circumstances would continue during the season with gradual thawing, is soon exhausted. Should the winter open with extremely cold weather, freezing the ground followed by snow, the frost will be retained until the opening of spring, when the melting snow and the warm rains will carry off the water with a rush, causing freshets and shortening the water season. It is clear that under any of the conditions mentioned, a storage supply for a mining system is the safest, but the magnitude of hydraulic operations in California has not justified any large company or companies in constructing such works. The best arranged systems are those dependent on water from numerous streams fed by the season's rain and snow fall, assisted by impounding reservoirs. The temperature of the country determines the length of the mining season, and the formation of anchor ice in the ditches indicates at once the necessity of closing down for the winter.

The irregularities of the pitch of the bedrock and the trend of the auriferous channel develop with the opening of the ground. Such circumstances may cause changes in the extension of the main sluice and the driving of different lines of ground sluices. The sudden appearance of a slide may precipitate into the works 5 to 20 acres or more of ground from one to several hundred feet in depth. This is not an unusual occurrence when pipe-clay exists in masses throughout the banks, or the gravel reposes on tilted seams of clay, or on steep or slippery bedrock. The advent of a large slide changes all calculations for work, requiring all energy to be bent at once to its removal (to reach the pay dirt), the time

and cost being dependent on its extent and volume and the available water supply. If no serious accident has occurred and the machines are not buried beneath the debris it may be considered fortunate. In large claims with deep banks it is not an unusual thing for the main line to be damaged and giants covered up.

In early days, with comparatively light banks, there were several strings of pipes in diggings, but the experience has demonstrated the fact that the most profitable plan of working is to concentrate the water, working with the largest sized nozzle in conformity with the supply. Present practice is to deliver the water under the greatest economical head through a single main to a central position of the works, to avoid all possible necessity for changes. Hence its location is of the greatest importance. At this point the pipe is forked, and gates put in to meet the requirements for distribution. The necessity for two working faces for continuous washing is obvious, namely, for keeping up the ground sluices, the running possibly of powder drifts, and the advancement of the giants to keep up with the work, giving constant employment to the men.

A few of the difficulties encountered in every-day mining operations have been mentioned with a view to showing how hazardous these anticipated estimates of yield are, when it is practically impossible to predict just where the section from surface to bedrock on the line of the channel can be cleaned up, upon which work the estimated value of the cubic yard is based.

Monthly surveys of the washings in large hydraulic claims are unnecessary. The average number of cubic yards hydraulicked per inch of water in every properly managed mine should be known by its superintendent, which when working in gold-bearing river deposits enables him to approximate the yield. Miners for convenience apportion the yield of the gold to the quantity of water used during the run. Hence the expression "the ground pays so much per inch of water." All the ordinary miner wants to know is, how much gold he can get with the a given amount of water, for which he pays a stipulated use of price per inch; the other expenses he can readily regulate. How much the yield per cubic yard is, or how many cubic yards he can work per inch of water, are factors about which he has the most vague ideas. In California ground yielding less than 15c. per inch of water has paid large profits. In established works with a known water supply, the washings for the season are arranged in accordance with the developments, cleaning up as far as possible all the bottom ground which can be reached before shutting down.

The standard by which the valuation of a hydraulic property must be gauged is its earning capacity judged independently of its management or cost sheets. In determining the value of a hydraulic mine there are numerous factors involved, factors which differ as mines differ, and which, weighed relatively, limit the value of a property. The problem involves not only questions of business, mining and engineering, but requires for its solution intelligent and conscientious work on the part of a reliable man trained by long experience in the successful opening, equipping and managing of hydraulic mines.

Cyanide vs. Chlorination in South Africa.—Mr. Chas. Butters, in his presidential address before the Chemical and Metallurgical Society of South Africa, said: "There has been a great deal of study given to the use of chlorine as a dissolving agent, but its use is very limited in comparison with that very easily handled solvent, cyanide, so that I am prepared to state that cyanide is slowly but surely displacing chlorine on the Witwatersrand for all purposes. I have no doubt that upon these fields eventually the use of chlorine will be discontinued; and, having been among the first to be connected with the introduction of the chlorination process in this country, I have rather jealously guarded the interests of chlorine as a solvent. I must admit now that, given equal preparation of material for the use of the solvent, the same percentage of solution of precious metal in the materials treated can be obtained as well with cyanide as with chlorine."

The Russian Iron Industry.—The rapid extension of the iron industry in European Russia, through the establishment of the several large new iron and steel rolling mills already erected or now in course of erection in the country, has called into existence a new branch of the iron business, which hitherto depended chiefly on foreign supply, says the *Engineer*, the construction of plants for the manufacture of iron and steel. New works for this purpose have just been opened in Riga by a company forming a branch of a similar one in Dahlbruch, in Westphalia. The Riga Company has secured a well-situated piece of ground of 17½ acres, so as to be able to extend its works to fourfold their present dimensions. The buildings and machinery, including a 30-ton crane, are all of the most improved description and are provided with electric transmission of power and electric lighting. The designs for the machinery to be constructed will be furnished by the parent establishment in Dahlbruch. Germans, Belgians and French are taking a firm hold on the iron production business in Russia.

Artificial Diamonds.—According to the *Engineer* a new process for producing artificial diamonds has been experimented on successfully by Dr. Quirino Majorana. The present method consists fundamentally in heating a piece of carbon by the electric arc, and then submitting it to a violent pressure by means of a small plunger actuated by a piston, on which a pressure of 5,000 atmospheres was suddenly developed by explosion. When a sufficiently strong cylinder had been constructed to withstand this enormous pressure, the experiment produced a black mass consisting largely of graphite and amorphous carbon. On employing Berthelot's method to isolate the diamonds if they existed, small microscopic crystals were obtained, mostly black and opaque, but which exhibited all the properties of true diamonds, notably in their manner of burning at a high temperature. The conclusion drawn from these experiments, says *Nature*, is that pressure and heat are alone sufficient to transform amorphous carbon into the crystalline or diamond form, and that the presence of a metallic solvent, as in Moissan's experiments, is not essential to the transformation.

THE JONES CUPEL MOULDER.

This is a machine just introduced by the Parke & Lacy Company, of San Francisco, for making bone-ash cupels for assaying, whereby the cupels are formed by a steady, continuous and increasing pressure, the system of levers and toggles being so arranged that the pressure is gradually increased as the increasing density of the bone-ash requires, and a heavy final pressure secured without extraordinary effort on the part of the operator. When the compression is completed the leverage is automatically changed and the finished cupels are expelled by a slight movement of the foot. It is claimed that with this machine the cupels made are of the same size and density, are perfect in shape, and much less likely to crack in drying than the handmade cupel. The machine can make from 250 to 300 cupels an hour.

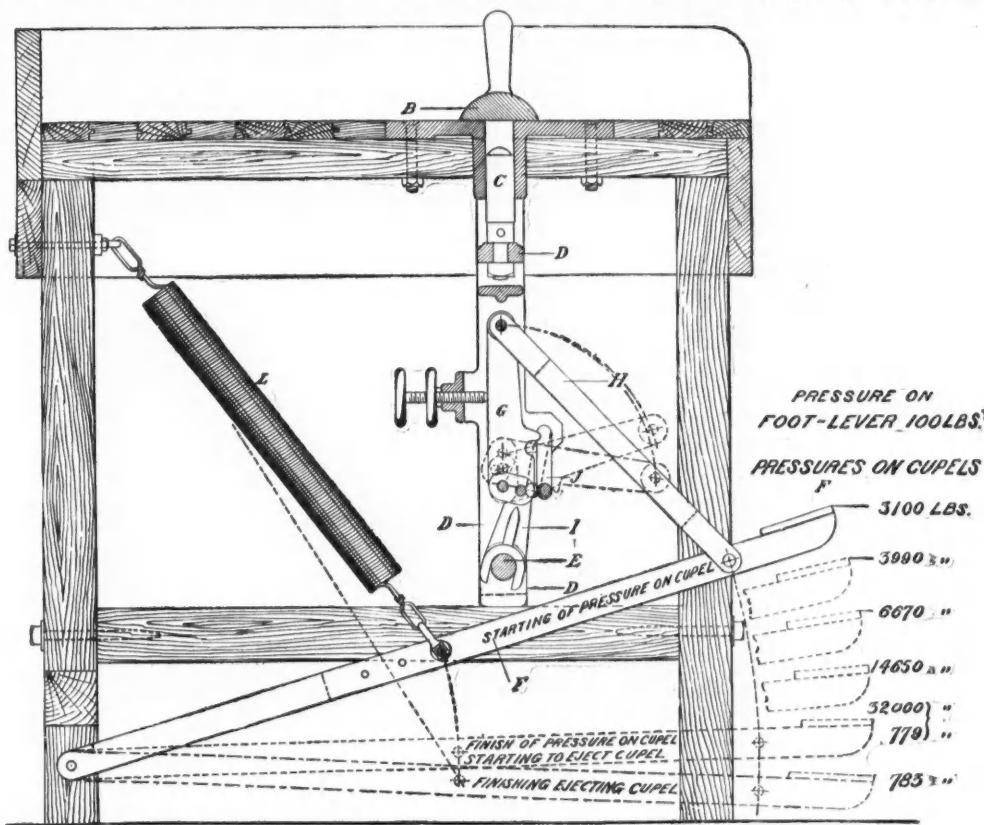
CALCIUM CARBIDE IN GERMANY.

A report from Consul-General Mason at Frankfort, Germany, to the State Department says that hitherto the main source of supply of calcium carbide for Germany and Eastern Europe has been the Aluminium-Industrie-Actien-Gesellschaft, at Neuhausen-on-Rhine, which was the first establishment, except one in France, to begin the manufacture of carbides on a large scale. This company supplies about 60,000 kg. (132,276 lbs.) of carbide annually to the Prussian State railways, where it is used to purify and enrich oil gas for illumination. The company is steadily

darting flames of acetylene gas intensified by pressure, whereby the high temperature required to combine the carbon and calcium can be generated on a large scale and more cheaply than by electricity. As to the practical efficiency of this method no positive information can be obtained, but it is regarded by disinterested experts as perhaps the most promising of the various new processes that have been announced.

Expert opinion in Germany seems agreed upon the proposition that, with reasonable precautions to secure purity in the carbide and properly constructed apparatus, its use may be rendered quite as safe as that of petroleum lamps, high-tension electrical conductors, steam boilers, and liquid carbonic acid. From the reports presented at a recent meeting of the Chemical Industrial Association, at Berlin, it would appear that most of the danger attaching to acetylene belongs to its liquid form. Mingled with atmospheric air, pure acetylene is less poisonous than coal gas. But in the present stage of carbide manufacture, it often contains impurities which, in contact with water, develop phosphureted, sulphureted, and even arseniureted hydrogens, which are not only deleterious when inhaled, but in contact with copper produce gaseous compounds that greatly increase the danger of explosion under pressure. These can, however, be almost wholly removed by passing the acetylene gas through an acid solution of a metallic salt.

But the principal peril is encountered when, for convenience of transportation or other reason, acetylene gas is condensed into liquid form. This may be done by a pressure of 68 atmospheres at any temperature below 98° Fahr., which is considerably less than the pressure and cold required to condense carbonic acid gas. Acetylene so liquefied has a ten-



THE JONES CUPEL MOULDER.

enlarging its capacity and now offers for export carbide of standard quality, capable of producing from 300 to 320 liters of acetylene gas per kilogram, at the following prices: Lots of 1 to 1,000 kg., 60 centimes per kilogram (\$115.80 per metric ton); lots of 1,000 to 5,000 kg., 50 centimes per kilogram (\$96.50 per metric ton); lots of 5,000 kg. or over, 45 centimes per kilogram (\$86.85 per metric ton). These prices are for the carbide alone at the works in Neuhausen. It is packed for shipment in tin cans or drums and these, when sold for export, are again inclosed in wooden cases, and for this the following packing charges must be added to the net rates given above: The cans are of three sizes, containing, respectively, 12, 50 or 180 kg., equal to 26, 110 and 396 lbs., and are charged to the purchaser of carbide at 15c., 58c. or \$1.25 each, according to size. For the wooden cases in which the cans are packed, the charge ranges from 10c. per small can to 20c. for the large ones, so that the whole cost for hermetically sealed tin drums and wooden casings would be not far from \$15.75 per ton of carbide.

These are, so far as can be ascertained, the minimum prices at which carbide can now be obtained in Germany. The only other competitor in the German field is a factory at Bitterfeld, in Prussian Saxony, where about 10,000 kg. are produced annually with electric heat generated by steam power, whereby the cost is so increased that carbides from Bitterfeld are sold at 80 marks per 100 kg., equal to \$190.40 per metric ton.

Of new enterprises, the most important appears to be a laboratory now in construction at Canton Glarus, Switzerland, where water power to the extent of 4,000 H. P. will be employed. These works are intended to be ready for operation early next spring, and are expected to furnish a large and constant supply of carbide at from \$60 to \$70 per metric ton.

Of the new systems or processes of manufacture, one of the most interesting and important is that invented by Emil Walther, of Saxony, by which carbides are said to be produced by smelting together carbon and alkaline earths in a furnace heated, not by electrical current, but by

density to explode into carbon and hydrogen, with an intense development of heat, and under these circumstances is unmanageable by any means that have yet been devised. Liquefied acetylene will probably some time be as safe and common a material as liquid carbonic acid, but it is not so now, and until it is better understood and mastered calcium carbide will doubtless continue to be its safest and most convenient vehicle.

Graphite in Italy.—The deposits of graphite in the valley of Chisone have recently, according to *Rassegna Mineraria* of October 11th, been purchased by a company known as the Anglo-Italian Talc and Plumbago Company, Limited. The company has its headquarters in England, its representative in Italy being Signor Enrico Brayda.

Composition of Brass.—In a paper read recently before the American Institute of Mining Engineers, Mr. E. W. Sperry states that to machine readily brass should contain a certain proportion of lead, "clock brass" and "screw rod" having usually from 1½ to 3%. The addition of tin is detrimental, as it hardens the alloy and thus prevents it being as rapidly worked.

The Electrolytic Determination of Cadmium.—S. Avery and Benton Dales in *Journal American Chemical Society*, 19, 379-382 and 513 report that the double oxalate and acetic acid methods for the determination of cadmium are unsatisfactory; the cyanide method yields fair results with relatively large amounts of cadmium, and the formate method yields satisfactory results, provided certain conditions, which they prescribe, are rigidly maintained.

PERSONAL.

MR. ALGERNON DEL MAR passed through New York last week on his way from Rat Portage, Ont., to London.

JUDGE W. H. DIXON, of Salt Lake, is visiting the Dexter Mine, Tuscarora, Nev., in which he is largely interested.

MR. R. G. MCCONNELL, head of the Canadian Geological Survey party in the Kootenay country, has arrived at Ottawa.

MR. HERMAN GARLICH has recently visited Mercur, Utah, and brought away favorable impressions of that unique gold region.

MAJOR A. V. BOHN was recently on the West Dip, in the Mercur region, Utah, where he contemplates carrying on some systematic exploiting.

MR. H. D. RIPPETO has made an investigation of the recent developments in the Ashbrook District, Utah, and predicts an active mining revival there next season.

MR. RUSSELL L. DUNN, mining engineer, of San Francisco, has gone to Siberia to examine some quartz propositions. He expects to remain there several months.

SIR CHARLES ROSS, of Rosshire, Scotland, has been inspecting his properties at Rosslund, B. C. He has bonded the Portland claim, already owning its neighbor, the Velvet.

MR. RICHARD PLEWMAN, a mining man, of Rosslund, B. C., has been appointed official liquidator in the matter of the winding up of the affairs of the O. K. Mining Company, of Rosslund.

MR. A. RAHT, who has been for several years general superintendent of the smelting works belonging to the Guggenheim interests, will retire from this position at the end of the present year.

MR. T. W. SEIMON, late treasurer of the Philadelphia Company, has been appointed general manager of the company. Mr. H. O. CAMERON, late assistant treasurer, has been appointed treasurer.

MR. J. E. JACKSON, Salt Lake agent of the Consolidated Kansas City Smelting and Refining Company, is in British Columbia. He has been absent over a month and in the interim Mr. W. L. HALLETT is in charge of the Salt Lake office.

MR. HORACE F. BROWN has gone to Mercur, Utah, where he will superintend the erection of his patent furnaces and the Loomis gas producers for the new De La Mar Golden Gate mill. Mr. Brown can be addressed at Mercur, Utah, until January 1st.

MR. B. S. REVETT, a high authority on placer mining, is sojourning at the Knutsford, Salt Lake, recovering from a mishap which occurred near Bennett, Idaho, on October 13th. He was on the stage by the driver when the front axle broke square off; as the stage was going at a good pace he was hurled headlong and a heavy trunk and the top of the stage pinned him to the ground. Fortunately no bones were broken, though he is badly bruised. He was able to reach Salt Lake October 20th, and he will have to remain there for a fortnight.

SIR CHARLES TUPPER'S party, comprising Mr. C. ASHWORTH, of London, and others, who have been visiting the Kootenay country, were lately reinforced by SIR WILLIAM VAN HORNE, MR. R. B. ANGUS, MR. JAMES ROSS, MR. E. S. CLAUSON, of Montreal; MR. B. B. SMALLKY, of Burlington, Vt.; MR. W. WHYTE, MR. R. MARPOLE and MR. L. A. HAMILTON, of Winnipeg. Sir William Van Horne's party made an especial visit to the mines at Rosslund and at Nelson, and after visiting points in the Slovan division they then proceeded to Vancouver and other points on the coast.

OBITUARY.

THOMAS GOLD ALVORD, who died in Syracuse, N. Y., October 26th, aged 86 years, was best known to the public from his prominence in State politics, having served for many years in the New York Legislature, besides holding the office of Lieutenant-Governor for one term. He was, for nearly all his active life, concerned in the salt manufacturing industry at Syracuse, and was a salt-maker on his own account for a number of years.

THOMAS DOANE, civil engineer, died in Boston, Mass., on October 23d, aged 77 years. At various periods during his practice he was connected with nearly all the railroads running out of Boston. In 1863 he was appointed chief engineer of the Hoosac Tunnel. He located the line of the tunnel and built the dam in the Deerfield River to furnish water power. In this work he introduced nitro-glycerine and electric blasting for the first time in this country. In 1869 he went to Nebraska, where he built 240 miles of railroad on the extension of the Chicago, Burlington & Quincy. While in Nebraska he took a leading part in the agitation of the question of establishing a college in that State, and in recognition of his services the institution was named the Doane College. In 1873 he was reappointed consulting engineer of the Hoosac Tunnel, and on February 9th, 1875, he was chief engineer of the tunnel, he ran the first locomotive through it. In 1879 he was appointed consulting and acting chief engineer of

the Northern Pacific for one year, and since the expiration of that time he had resided in Charlestown.

SOCIETIES AND TECHNICAL SCHOOLS.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—At a regular meeting held October 19th a paper by C. A. P. Turner, entitled "Thermal Condition of Iron and Steel Under Stress, and Measurement of Stress by Means of Thermo-Electricity," was read. In this paper Mr. Turner showed that the strain in steel bars of large section could be measured easily and accurately by means of the thermopile and galvanometer, and that it was thus possible to ascertain whether or not any particular beam was fulfilling its proper function. An animated discussion took place, during which a number of interesting points were brought out. A report from the Committee on Roads was presented. It will be read and discussed at the November meeting.

UNIVERSITY OF WYOMING.—This university began its 11th year on October 23d with a largely increased attendance. It includes, in addition to the usual collegiate and graduate courses, a school of agriculture, a school of mechanical arts, a school of mines and a normal school. A new course of study has been adopted this year embracing three years' preparatory, four years' classical, literary and scientific courses in the college of liberal arts and graduate work in nearly all departments. The school of mines is publishing a geological survey of the State. The bulletins so far issued have dwelt chiefly with coal and petroleum, which are the most important minerals of the State at present produced. The geological party explored the oil and artesian water basins of the northern part of the State, and the paleontologists added some valuable specimens to the saurians of the museum. An addition to the mechanical building has been erected this fall and gives increased space to the assaying department. It contains rooms for wet and dry work of students, and also furnace and fuel rooms.

FRANKLIN INSTITUTE, PHILADELPHIA.—The programme of lectures during the year 1897-98 will include the following for the mining and metallurgical section: Wednesday, November 10th, Mr. John Gifford, New Jersey Geological Survey, New Brunswick, N. J., on "Forestry as Related to Geology and Engineering."

Wednesday, December 8th, Mr. H. F. J. Porter, Bethlehem Iron Company, Bethlehem, Pa., on "Fatigue of Metal in Iron and Steel Forgings."

Wednesday, January 12th, Mr. Pedro G. Salom, Philadelphia, on "The Electrolytic Production of Lead from Galena."

Wednesday, February 9th, Mr. Paul Kreuzpointner, Testing Department Pennsylvania Railroad Company, Altoona, Pa., on "The Practical Aspect of Present Methods of Testing Iron and Steel."

Wednesday, March 23d, Alexis A. Julien, Ph. D., Columbia University, New York, on "Building Stones: Elements of Strength in their Constitution and Structure." The last named lecture will be illustrated by lantern slides and by the lantern microscope.

In the Electrical Section Mr. Lewis G. Rowand, of Camden, N. J., will lecture on January 25th on "Magnetic Ore Separation."

Other interesting lectures will be given on various subjects not yet announced.

INDUSTRIAL NOTES.

The Gate City Iron Works, of Chicago, Ill., will build a new machine shop, 80x336 ft.

The Delaware Iron Works, at New Castle, Del., have recently resumed operations, employing about 500 persons.

The American Sheet Iron Mill, at Phillipsburg, N. J., will it is expected, shortly settle its differences with its employees.

The Marmet-Smith Coal Company, of Charleston, W. Va., is building a large towboat. The company intends to do its own towing.

The Lake Shore Foundry Company, of Cleveland, O., is said to be contemplating the erection of a new foundry, at a cost of \$150,000.

The Brooks Locomotive Works at Dunkirk, N. Y., have recently received an order from the Kiushiu Railway of Japan for 12 mogul side-tank locomotives.

The Newport News (Va.) Shipbuilding and Dry Dock Company has secured the contract to repair the vessels of the International Navigation Company, amounting to over \$200,000.

The Senoret Chemical Company has been incorporated at St. Louis, Mo., with a capital stock of \$50,000. The stockholders are William M. Charman, W. P. Charman and R. E. Bebout.

The New England Coke and Gas Company is understood to have purchased the land situated on the Mystic flats, Boston, Mass., for the purpose of erecting its plant. It is expected that the plant will be in active operation within a year.

The furnaces of John H. Bass at Rock Run, Ala., Lenoir, Tenn., and his foundries in Chicago, St. Louis and Fort Wayne have all been consolidated

into one corporation, with \$2,000,000 capital, and will be put in operation at their full capacity.

The Dickinson Chemical Company has filed articles of incorporation at Detroit, Mich., and will manufacture chemicals and other articles upon a capital of \$50,000. Albert E. Dickinson, Porter A. Tucker and Henry F. Meier are the incorporators.

The Denver Onyx & Marble Company and the Beulah Marble Company have combined. The capitalization is \$700,000. The Denver company has the contract for the interior of the Capitol building, amounting to several hundred thousand dollars, and the Beulah company has furnished much of the stone.

The well-known metal firm of Aron Hirsch & Sohn of Halberstadt, Germany, gives notice that, in view of the constant increase of American metal production and trade with Germany, it has appointed Mr. Ludwig Vogelstein representative in the United States. His office will be at No. 62 William street, New York.

Preliminary steps have been taken at Pittsburg recently to form a combine of sewer-pipe and terracotta ware manufacturers of the United States, with a capital of \$11,000,000. The proposed combine will be controlled by Eastern capitalists. Nineteen manufacturers have already signed the agreement, and it is expected that the thirty-one others in the country will also sign.

The new coal receiving machinery of the Northwestern Fuel Company at West Superior, Wis., is in successful operation. It was put in by the St. Paul Foundry Company, of St. Paul, Minn., and is a new invention. It is very similar to the Brown hoist, except that the bridges rest upon foundations at either end and in the center. The advantage claimed is lessening the vibration.

The Southern Chemical Company filed articles of incorporation at Winston, N. C., recently to operate a large fertilizer factory in that city. The capital stock is \$100,000, with the privilege of increasing it to \$500,000. Over \$75,000 has already been subscribed. The incorporators are Dr. H. B. Battle, P. H. Hanes and W. T. Brown, of Winston, and F. H. Fries, of Salem, N. C.

Messrs. Baker & Company, platinum refiners of Newark, N. J., have issued a very interesting pamphlet descriptive of platinum, its sources of supply, identification and separation of the ore, together with facts of interest to prospectors and miners. This concern being an extensive buyer of platinum in all forms is anxious to encourage the search for new sources of supply. It offers to make tests for platinum free of charge on samples delivered at its works.

The Collins Company, of Collinsville, Conn., in order to better its facilities and to meet the demands of increasing business, is making extensive improvements in its plant at Collinsville, and has placed the contract with the Berlin Iron Bridge Company, of East Berlin, Conn., for a large addition to the forge shop. The new construction will be entirely of iron in order to have it fireproof, no wood-work being used in the construction.

The Anaconda Copper Mining Company has just placed an order with the Edward P. Allis Company, of Milwaukee, for four Wethey calcining furnaces to be placed in its plant at Anaconda. These furnaces are double-decked, each floor being 12 x 100 ft. The present calcining plant of the Anaconda Company consists of 97 Bruckner cylinders of the largest size. The Wethey furnaces to be put in will increase the treating capacity of the plant some 200 tons of concentrates per 24 hours.

The Riter & Conley Company, of Pittsburg, has the contract for the new buildings for the West Leechburg Steel and Tin Plate Company, to be erected at West Leechburg, Pa. The main building will be 100 ft. span by 225 ft. long by 20 ft. high to the square of roof, and the boiler-house is 34-ft. span by 48 ft. long by 14 ft. high. Two partitions will extend entirely across the building, dividing same into a furnace room, 50 x 100 ft. and cold mill room 150 x 100 ft. and machine shop 25 x 100 ft.

B. F. & W. Bertolet, of Reading, Pa., have taken a lease on the immense culm bank of the old Girard colliery, near Girardville. The bank contains much good coal in the smaller sizes. This coal is separated by washing the culm in a trough through which run scrapers worked by an endless chain. The washed product passes along a large cylinder-shaped mud-screen, and thence to shakers which sort it. Constant agitation of the water in the washing trough keeps the coal on top, and in reach of the scrapers, while the slate sinks to the bottom. The operators take out from 200 to 250 tons of good coal per day.

In Philadelphia, October 27th E. O. Michener, as counsel for a number of stockholders, filed a bill in equity in Common Pleas Court No. 1 against the Acetylene Light, Heat and Power Company, Charles C. Adams, president; Samuel L. Kent, vice-president; Edward C. Napheys, secretary and treasurer; and Rudolph M. Hunter, T. Morris Perot, Jr., W. W. Ingham and the three officers of the company as directors, asking for an injunction restraining them from interfering in any way, manner or form with the business or property of the company, and praying that a receiver may be appointed to take charge of the property and assets. The bill charges various acts of mismanagement.

The Edward P. Allis Company, of Milwaukee, Wis., has delivered to the Carnegie Steel Company, Limited, at Pittsburgh, for their Duquesne steel works, a large Bessemer blowing engine. This engine is a horizontal duplex cross compound condensing Bessemer blowing engine, having two 76-in. diameter air cylinders, one 46-in. and one 88-in. low-pressure steam cylinder with a stroke of 60 in. The engine is capable of delivering 2,800 cu. ft. of air per minute at a pressure of 30 lbs. to the square inch. The main shaft of this engine is 24 in. in diameter in main bearing and 26 in. in diameter at the wheel fit. The fly wheel is 30 ft. in diameter and weighs 125,000 lbs. This machine is supplied with one of Reynold's independent improved 36 x 16 in. air pump and jet condensers. The consumption of steam per indicated horse-power will be about 15 lbs. per hour.

For some time negotiations have been under way by which the Shenango Valley Steel Company will take over the Neshannock Furnace, the New Castle Steel and Tin Plate Company and the recently organized Shenango Tin Plate Company. Arrangements have been completed by which the interests of these four companies will be consolidated, and the name retained will be Shenango Valley Steel Company, the capital stock being \$1,500,000. Neshannock Furnace is one of the best equipped stacks in the Shenango Valley and has a capacity of about 300 tons of iron per day. The plant of the Shenango Valley Steel Company is one of the most complete Bessemer plants in the country, having recently been remodeled. A bar mill is being added and the concern will be in the market as makers of sheet bars about January 1st. The plant has a daily capacity of about 600 tons of billets. The plant of the New Castle Steel and Tin Plate Company was originally built in 1892-93 and was put in operation in October, 1893. The Shenango Tin Plate Company has only recently been organized, but the contracts for the buildings and most of the equipment have already been placed. The buildings have been given to the Shiffler Bridge Company, and the main building will be about 1,600 ft. long. There will be another building about 600 ft. long and numerous other smaller buildings. The plant is to contain 30 hot mills and 28 cold mills, the contract for these having been placed with Mackintosh, Hemphill & Company, of Pittsburgh. These mills will be driven by three twin and one single tandem compound condensing engines, the contract for which has been placed with the Edward P. Allis Company, Milwaukee, Wis. The sizes of the steam cylinders in each of these engines are as follows: High-pressure steam cylinder, 25 in. in diameter; low-pressure cylinder, 50 in. in diameter; each 60-in. stroke. It is expected to have this plant ready for operation about April 1st, 1898.

TRADE CATALOGUES.

A good looking little pamphlet sent out by the Keystone Electric Company of Erie, Pa., describes their multipolar generators, giving numerous diagrams, and tables for the use of intending purchasers.

A neatly illustrated little pamphlet, issued by Jas. L. Robertson & Sons, 204 Fulton street, New York City, gives a brief description of the Robertson shaking and dumping grate bar and cuts of some large plants using it.

The Deane Steam Pump Company, of Holyoke, Mass., has issued a finely illustrated catalogue of their well-known pumps. Besides giving cuts of pumps for a great variety of uses, the catalogue contains a number of useful tables and should be of interest to mining men and any one having occasion to handle water. It may be had on application to the company.

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 OCTOBER 19TH, 1897.

- 501,813. CEMENT KILN. Henry Campbell, Milwaukee, Wis. Assignor of one-fourth to Philip Gordon Campbell, same place. This kiln is provided with a fire-proof lining and has its lower portion of masonry in closing an air space, metal columns within the air space, an apertured metal plate supported by the masonry and columns to constitute a base for the lining, and a kiln pot.
- 501,890, 501,891. CRUSHING MACHINE. Courtland Skinner, Baraboo, Wis. Combination of two jaws, a single set of eccentric mechanism below the jaws for moving both the jaws vertically and simultaneously and brace-rods pivoted to the upper and lower edges of the jaws and having their opposite ends pivoted to stationary points, whereby the jaws are moved laterally simultaneously with the vertical movement.
- 501,899. APPARATUS FOR ROASTING AND DRYING ORES. Philip Argall, Denver, Colo. Combination of a plurality of independent non-communicating cylindrical tubes symmetrically arranged around a common axis, mounted in an inclined position and so as to be rotated as one, with a combustion-chamber sending its products of combustion through all the tubes at once, when all are charged with the material to be operated upon in balanced charges, in conjunction with means provided in each tube for sending pure, hot, dry air through the charges of ore during rotation.

- 591,943. AMALGAMATING APPARATUS. Lafayette Baudendistie, Denver, Colo. Combination of a cylindrical plate, inner screen and shaft upon which the screen and plate are mounted, of a perforated pipe applied to the outer surface of the screen with a suitable tank adapted to contain a clearing solution.
- 591,945. SMELTING FURNACE. Ferdinand N. Bergen, Tacoma, Wash. Combination with a hearth or ore chamber, of chambers upon opposite sides of the ore-chamber and communicating therewith, means for supplying oil to the chambers, and air-inlets for each chamber, fans in each of the chambers and means for revolving each alternately for changing the direction of the draft through the ore chamber.
- 592,006. RAKE APPLIANCE FOR ORE ROASTING FURNACES. Julius W. Hegeler, La Salle, Ill. Combination with the rake-rod of a supporting frame provided with a track, a series of flanged rollers between the track-rails and a truck connected to the rear end of the rake-rod.
- 592,024. DRILL JAR. Harvey F. Seybert, Queenstown, Pa. Combination of two slotted interlocking members, a spring, arms, abutment, screws and nuts.
- 592,035. ACETYLENE GAS GENERATOR. David S. Williams, Philadelphia, Pa. This machine comprises a generator provided with a water supply pipe and a gas-discharge pipe, a holder connected to the gas-discharge pipe, a valve in the pipe, a rod connected to the bell of the holder, and adapted to shut off the supply of gas when the holder is filled, a receiver comprising a reservoir interposed between the generator and a holder having a branch communicating with the gas-pipe leading therefrom, and constructed to hold a body of water, a reservoir adapted to receive the water discharged by the pressure of gas in the receiver, and a float controlled thereby and adapted to cut off the supply of water to the generator.
- 592,038. SINKING PUMP. George P. Aborn, Warren, Mass. Assignor to the George F. Blake Manufacturing Company, New York, N. Y. Combination of two pressure cylinders, with pistons, a piston rod, a double-acting pump and its plunger, a valve and valve seat, an exhaust port, a valve moving piston and a cylinder containing the same, and an automatic mechanism for causing the pressure to move the piston and valve when the cylinder pistons reach the upper and lower ends of their stroke.
- 592,055. PROCESS OF TREATING ORES. Ernest C. Ketchum, Boston, Mass. This process consists in first roasting the ores, then subjecting them to the action of a solution of caustic alkali in the presence of heat to remove from the ores the lead and zinc, then subjecting the caustic solution containing the lead and zinc to electrolytic action in the presence of heat to remove the lead, in a cell or cells in which the anode is immersed in a solution that is free from lead, and that also is separated by a porous medium from the electrolyte containing the lead and zinc, and finally subjecting the solution in which the zinc remains to electrolytic action, also in the presence of heat, to remove the zinc, employing electric currents of different electromotive force in effecting the successive decompositions.
- 592,083. ACETYLENE GAS GENERATOR. John C. Duppe, Chicago, Ill. Assignor of one-half to Ripley J. White, same place. This apparatus comprises a generating chamber provided with a water-inlet opening, a source of means of water-supply and a layer of porous or absorbent material forming a lining in contact with the bottom and sides of the generating chamber, the layer being interposed between the calcium carbide contained within the chamber and the water-inlet opening.
- 592,097. ELECTROLYTIC APPARATUS. Bernard Moebius and Gustav Nebel, New York, N. Y. Said Nebel assignor to said Moebius. Combination of a vat for containing the electrolyte; an endless silver belt; means for slowly passing the belt through the vat, out of the vat, and back into the same; and mechanical means for oiling the surface of the belt when out of the bath and after the silver bar has been scraped off.
- 692,153. PRECIPITATING PRECIOUS METALS FROM SOLUTIONS. John S. MacArthur, Pollokshields, Scotland. Assignor to the Gold and Silver Extraction Company of America, Limited, Glasgow, Scotland. Patented in England, April 24th, 1894, No. 8,184; in Victoria, July 10th, 1894, No. 11,497; in New South Wales, July 12th, 1894, No. 5,171; in Queensland, July 14th, 1894, No. 2,695; in Tasmania, July 16th, 1894, No. 1,299; in New Zealand, July 2nd, 1894, No. 6,987; in South African Republic, August 7th, 1894, No. 684; in Brazil, August 28th, 1894, No. 1,743; in Canada, October 3d, 1894, No. 47,145; in South Australia, January 2d, 1895, No. 2,846; in India, January 11th, 1895, No. 193; in Western Australia, July 10th, 1895, No. 701; in Chile, November 21st, 1895, and in Mexico, November 10th, 1896, No. 925. The process consists in subjecting the cyanide solution containing a base metal to the action of a precipitant protected by a metal inert in the solution.
- 592,204. BLAST PIPE FOR STEEL FURNACES. Henry E. Parson, Brooklyn, N. Y. Combination of a blower, a blast pipe connecting the blower with the furnace, the blast pipe being provided with an opening intermediate of the blower and furnace, a steam blower located in the blast pipe between the opening and the furnace, and a door for opening or closing the opening.
- 592,220. HEATING AND ROASTING FURNACE. William E. Roberts, Butte, Mont. Assignor of two-thirds to Jared E. Gaylord and Francis P. Davidson, same place. This furnace is provided with longitudinal slots or openings extending entirely through its side walls from end to end, a plurality of brackets arranged in vertical series along the sides of the furnace, the brackets of each series supported one upon another and carrying and supporting the hearth roof and side walls, and means for taking the lateral strain of the arches.

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

GENERAL MINING NEWS.

ALABAMA.

WALKER COUNTY.

DORA MINING COMPANY.—This company intends to increase the output of its iron mines at Horse Creek.

PRICE.—The Ivy Coal Company has purchased these iron mines at Horse Creek, and will develop same, and operate coke ovens.

ALASKA.

CHILCOOT RAILROAD AND TRANSPORT COMPANY.—This company has been organized at Tacoma, Wash., to provide means for transportation from Dyea to the Upper Yukon. The incorporators are men interested in the Northern Pacific Steamship Company and the Washington & Alaska Steamship Company. They propose building a surface tram road, commencing at tidewater at Dyea, extending up an easy grade for a distance of eight miles, at which point a wire rope tramway will begin. This surface road will be equipped with cars to be drawn by horses. The tramway will extend from the point mentioned up through the Chilcoot Pass and over the summit down to Crater Lake, which is the most southerly of the chain of lakes connected with the Yukon River. The tramway will be built in two sections, the first four miles in length and the second section (which will run over the Chilcoot Pass), 3 1/2 miles in length. Mr. N. M. Bell, the San Francisco agent of the Trenton Iron Works, at Trenton, N. J., has closed a contract to furnish the material and machinery needed for this tramway, which will be on the Bleichert system. The projectors hope to have the road completed by January next.

KLONDIKE—YUKON DISTRICT.

Colonel Randell has reported to the War Department under date of October 9th that there are about 180 people at St. Michaels and good order prevails. Captain Ray has reported that he has selected as a military post a point near Rapid City about 250 miles from Dawson. He urges that Alaska be divided in two districts, the southern to remain under the present jurisdiction; the northern, including the gold region, to be placed under a military form of government until Congress can make other provisions.

Speaking of mining operations, he says the dense growth of forest and moss makes prospecting and development slow. Miners agree that they have discovered valuable lodes of low-grade ore, but the present high price of provisions bars the working of placers or ledges that do not pay more than an ounce a day for each man. Up to the time the boats failed to pass the bar at Fort Yukon, he estimates that from the boundary to the sea there were about 1,200 people, not including those stranded at St. Michaels.

Captain Ray discusses several new routes and says he is informed that from Cook Inlet by the head of Copper River will be the shortest and most practicable route for railroad communication with the open sea. As part of his scheme for military government of the northern territory, he suggested that a court be established at the capital, the appointment of a commissioner of mines to settle disputes as to title, and the passage by Congress of a code of laws for the Territory.

In a supplemental report Captain Ray notes the arrival of the transportation company's steamer *Weare* with a cargo of 200 tons of provisions. When navigation closes, he says, there will be 600 tons of provisions at Fort Yukon and he will do what he can to assist in forwarding supplies and to protect the caches from raids. There were 130 people at Fort Yukon and much dissatisfaction existed among them over the failure of the transportation company to forward them to their destination.

The latest advices are that the Yukon was entirely frozen over at the end of September, and navigation is at an end. The accounts as to the supplies of provisions are contradictory. As suggested in the article by Mr. Bratnover in our issue of October 23d, there is an epidemic of typhoid at Dawson, with many deaths.

The following is a copy of a bill of goods which was purchased in Dawson from one of the post traders in August, and shows the current prices at that date: 100 lbs. bacon, \$44; 200 lbs. flour, \$24; 50 lbs. beans, \$6.25; 50 lbs. sugar, \$15; 24 cans milk, \$12; 10 lbs. peas, \$12.50; 15 lbs. coffee, \$7.50; 12 cans, \$4; 12 plates, \$6; 20 lbs. rice, \$5; 10 lbs. salt, \$1; 2 cans pepper, \$1; 12 cans butter, \$18; 2 frying pans, \$3; 1 case L. tongue, \$12; 1 case R. beef, \$9; 6 blk. cod-fish, \$3; 1 case tomatoes, \$10; 55 lbs. ham, \$24.75; 10 lbs. oatmeal, \$2.50; 30 lbs. potatoes, \$6; 6 cans B. powder, \$4.50; 4 cans cocoa, \$3; 20 lbs. crackers, \$5; 1 can opener, 50c.; 6 pkgs. matches, 75c.; 2 1/2 lbs. candles, \$1; total, \$241.25.

ARIZONA.

MARICOPA COUNTY.

KASSER GOLD MINE.—Since the purchase of the majority of the stock of this company by John J. Gibbons, of New York, considerable work has been done at the mine. The double compartment shaft is now down 100 ft., and the 10-stamp mill has been entirely rebuilt.

MOHAVE COUNTY.

MINNESOTA & CONNOR MINES.—These properties are reported sold to Thomas Ewing, of San Francisco, for \$250,000.

YAVAPAI COUNTY.

ARIZONA ONYX COMPANY.—Active development work is going on at the Big Bug properties of this company.

CROWN POINT.—A strike of gold ore averaging \$20 per ton is reported at this property.

CALIFORNIA.

(From Our Special Correspondent.)

CALIFORNIA STATE MINERS' ASSOCIATION.—The sixth annual convention of this association took place at San Francisco on October 18th, 19th and 20th. Over 400 delegates were present from every mining county in the State.

Jacob H. Neff, president, and Julian Sonntag, secretary, were re-elected. T. J. Parsons, vice-president, and S. J. Hendy, treasurer, were also elected, and the following executive committee appointed—At large, W. W. Montague, Edward Coleman, A. Caminetti, W. C. Italtson, W. S. Keyes, George Stone, R. McMurray, John McMurray, James O'Brien, S. B. Christy, L. F. Byington, Dan T. Cole, J. J. Crawford, J. F. Halloran, John M. Wright, S. K. Thornton, C. W. Cross; Yuba, Joseph Dunfee, Louis Conrad; Sierra, F. R. Wehe, J. O. Jones; Trinity, P. M. Paulsen; Amador, J. F. Parks, E. C. Voorhies; Nevada, E. J. Rector, J. S. McBride; Plumas, A. Hall, John Roberts; Shasta, J. M. Gleaves; Calaveras, R. A. Parker, Mark B. Kerr; San Francisco, Andrew Carrigan; El Dorado, H. E. Pickett, G. H. Ten Broeck; Tuolumne, F. M. Williams, A. M. McDonald; Santa Clara, Charles C. Derby, R. R. Bulmore; Siskiyou, Andrew G. Meyers, John Daggett; Placer, Charles H. Carr, H. T. Power.

Other committees were appointed, as follows: Legislation—Fred Searles, John McMurray, Judge Seward, Louis Glass, E. C. Voorhies, F. R. Wene, E. H. Chapman, Charles A. Swisler, W. F. Prisk.

Revision of Federal mining laws—Curtis H. Lindley (chairman), W. S. Keyes, J. F. Halloran, John F. Davis, C. V. Gottschalk, T. L. Ford, A. H. Ricketts, Stanley A. Smith, R. C. Rust.

Mineral exhibition at Paris Exposition—J. J. Crawford (chairman), John Drggett, R. R. Walrath, A. G. Myers, T. B. Christy.

Federal Department of Mines and Mining—Tirey L. Ford (chairman), Louis Glass, Charles G. Yale, W. C. Ralston, J. J. Crawford.

Mineral lands—A. H. Ricketts (chairman), H. T. Power, George C. Sargent, A. H. Ten Broeck, Robert J. Nixon.

Jetties and dredging—John U. Wright (chairman), J. F. Halloran, W. F. Engelbright, John A. McIntyre, R. V. Robertson.

Conference with Anti-Debris Association—John Spaulding (chairman), James O'Brien, Thomas Clark.

Finance—Andrew Carrigan, A. A. Watkins, Louis Sloss, Jr.

The most important matters discussed at the convention were the Mineral Lands bill, the restoration of hydraulic mining and the establishment of a new department at Washington, to be known as the Department of Mines.

The report of the Committee on Dredging, recommending the establishment of a proper system of jetties in the Sacramento and San Joaquin rivers, supplemented by the use of powerful dredgers, was adopted. The Committee on Legislation recommended: First, that prompt and urgent measures be taken to secure the passage of the so-called Mineral Lands bill at the approaching session of Congress. Second, That Congress be urged to make further appropriations for the construction of restraining barriers and other works, with a view to the improvement and protection of the Sacramento and San Joaquin river systems, to the end that all branches of mining may be successfully and profitably conducted without material injury to other interests.

Congressman Vries said that the Mineral Lands bill was reported on the calendar of the Senate and would undoubtedly receive favorable action at the coming session. The Public Lands committee has the House bill under consideration and will doubtless report favorably upon it. It will in all probability be passed by Congress. The Congressman also said that he believed that if any delay is occasioned in the building of restraining dams with the money appropriated by the State Legislature and Congress, it will be due to the engineers who are deliberating over the plan, and suggested that the convention express by resolution its wishes in relation to the Mineral Lands bill and the construction of impounding dams.

Ex Congressman Caminetti introduced the following resolutions, which were adopted:

"Resolved, by the California Miners' Association, that the Secretary of War and the Chief of Engineers of the United States of America be, and they are hereby respectfully requested, as far as is consistent with their duty, to cause the preparation of plans and the construction of said impounding dams as early a date as possible.

"Be it further Resolved, that the members of the California delegation in Congress be and they are hereby requested to present in behalf of this association these resolutions to the Secretary of War and the Chief of Engineers.

"Be it further Resolved, that copies hereof be transmitted to said Secretary of War and Chief of Engineers and the California delegation."

A resolution by John M. Wright requesting Congress to pass the Mineral Lands bill was adopted.

AMADOR COUNTY.

(From Our Special Correspondent.)

ARGONAUT.—A 40-stamp mill is in course of erec-

tion by the Union Iron Works of San Francisco. The intention of the management is to sink to a great depth, at least as far as the Kennedy shaft, which is down to the 2,300-ft. level. The shaft in this mine is down on the incline 1,500 ft. The superintendent, W. F. Dechert, reports that three lots of ore 500, 500 and 700 tons each, milled at the Zeile mill, yielded over \$35,000, the last lot averaging \$35 per ton.

BUTTE COUNTY.

(From Our Special Correspondent.)

OREGON GOLD MINING COMPANY.—The triple-discharge two-stamp mill put in the Red Point mine, two miles south of Enterprise, by the Union Iron Works, of San Francisco, is doing excellent work, crushing 5 tons per stamp per day. Each stamp weighs 800 lbs. A Dodge rock breaker set to crush very fine is placed between the feeder and the battery; through this rock breaker the battery water is fed. The Red Point and Forty-Nine mines, comprising 160 acres of patented land, now known as the New Oregon mine, is being developed by tunnels and crosscuts. The vein, which is 12 ft. in width, shows 5% sulphures.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

BIG BONANZA.—At this mine, in Angels, which is being operated by the Oriole Mining & Milling Company, a rich strike has been reported on the 145-ft. level. This mine is near the famous Utica-Sickles mines, and was worked on the surface many years ago.

ROANOKE MINING COMPANY.—This company has suffered a very severe loss by an incendiary fire October 16th. The 20-stamp mill, two sulphuret houses, blacksmith shop, timber shed, hoisting works, six Frue concentrators and a large quantity of timber at the Moser mine was destroyed. The mill will probably be rebuilt at once.

ELDORADO COUNTY.

(From Our Special Correspondent.)

GRIFFITH CONSOLIDATED.—This group of mines embraces seven claims, including the Griffith Consolidated, Manzanita, Queen, Princess, Ophir and Potosi. The property has been extensively developed, and a number of veins have been exposed from 5 to 7 ft. in width, assaying from \$30 to \$65 per ton. The new plant now being placed in position consists of a 60-stamp mill, hoisting and pumping machinery, and an electric plant to furnish power and light for the mines. Fifty men are employed.

KERN COUNTY.

(From Our Special Correspondent.)

JOHANNESBURG GOLD MINING COMPANY.—This company has been incorporated under the laws of Arizona. Capital, \$1,000,000. Directors, H. J. Woolincott, Warren Gillelen, A. A. Daugherty and J. S. Salky, of Los Angeles; William H. McEwen, of Johannesburg, and G. M. Rose, of Randsburg. The property to be developed comprises the Monte Cristo, Golden Wedge, Alameda No. 2, and the Ceresus mines, all located about one mile northeast of Randsburg. Development work has been commenced.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

MARIPOSA GRANT.—It is reported that arrangements have been made to open up the mines on this property; that a dam will be built across the Merced River about one mile above the old Benton & Bullion smelters, near the Josephine, Pine Tree, Oso and Princess mines owned by the company. These mines have been idle for many years. With the dam 5,000 H. P. can be developed to operate the mines and an electric railway to be built to connect with the Southern Pacific Railroad. The Grant contains over 44,000 acres and is owned by Senator Jones, J. W. Mackay, the Hobart estate and the Exploration Company of London.

MONO COUNTY.

STANDARD CONSOLIDATED MINING COMPANY.—The latest weekly official letter from Bodie says that raise 2, Moyle ledge, 200 level, showed 10 in. good ore in the top. South drift, Black vein, 265 level, had 24 in. low grade ore. Raise 2, same vein and level, showed 24 in. good ore. Raise 1, Fortuna vein, 600 level, had 6 in. good ore. They were stopping fair to good ore from the Bullion ledge, 245 level; low grade ore from Black ledge on 265 and good ore on 318 level; fair to good ore from various points on 380 level, and fair to good ore from the Maguire vein on 485 level, and good ore from Fortuna vein on 600 level. The mill statement shows: Ore crushed for the week, 290 tons; average assay vanner tailings, \$7.47; concentrates produced, 2 1/2 tons; assay value, \$84.76; plate amalgam produced, 1.145 oz.; value per ounce, \$2.31.

NEVADA COUNTY.

L. S. Rose, of San Francisco, and W. W. Kirkham, of Nevada City, have bonded the Lyons & Eddy and J. C. Locklin's Mountain Chief quartz mines in Willow Valley, Nevada county. The new company will immediately begin working these properties on an extensive scale. The Lyons & Eddy and the Mountain Chief have produced \$200,000.

ASSURANCE MINING COMPANY.—This company has been formed for the purpose of working a placer claim near Rough and Ready. The incorporators are R. P. Stenson, J. J. Greany, Richard Connelly, John Mulroy and A. J. Erel.

NANAKA MINING COMPANY.—This company, of

Grass Valley, has elected the following directors: David Bryan, William La Bar, O. L. Twitchell, W. D. Smith and T. J. Mitchell. Officers: David Bryan, president; William La Bar, vice-president; T. J. Mitchell, treasurer and secretary.

SPENCE MINERAL COMPANY.—This company has been incorporated to work a copper mine at Spenceville. The trustees are Oscar T. Weber, E. M. Weber, James Price, T. J. Wrampelmeier and L. A. Wrampelmeier.

W. Y. O. D. MINING COMPANY.—At the annual meeting, October 18th, the old board of directors was re-elected as follows: J. R. K. Nuttall, Jacob Weissbein, Joseph Weissbein, P. F. Simmonds and Louis B. Parrott. The board organized by electing J. R. K. Nuttall, president; Joseph Weissbein, vice-president; Jacob Weissbein, secretary; Weissbein Brothers & Co., treasurer; T. H. Simmonds, superintendent.

(From Our Special Correspondent.)

MOUNTAIN CHIEF, LYON & EDDY.—These mines, near Nevada City, are reported to have been bonded by L. S. Rose, W. W. Kirkham and others, who will run the drain tunnel in the Lyons & Eddy mine into the Mountain Chief and erect a hoisting and pumping plant.

NORTH STAR MINING COMPANY.—The United States Circuit Court of Appeals, in the case of the Carson City Gold and Silver Mining Company vs. the North Star Mining Company, has confirmed the judgment of the lower court with costs. The plaintiff owns the Irish American mining claim in Nevada County, Cal., and the defendant worked its lode under the surface of the Irish-American claim. The decision of the lower court, which has been affirmed, was that the defendant has a right to pursue the North Star ledge to any depth underneath the surface of the Irish-American mine provided the end lines are not crossed.

PLACER COUNTY.

EUREKA CONSOLIDATED MINING COMPANY.—At the annual meeting, October 18th, the old directors were re-elected, with William Fries president and H. P. Bush secretary. The company has about \$5,000 on hand and no indebtedness.

MAYFLOWER GRAVEL MINING COMPANY.—At the annual meeting, October 19th, the following directors were elected: F. Chappellett, F. H. Green, H. Bendel, A. C. Freese and H. Scott Seaton. Officers were elected as follows: President, F. Chappellett; vice-president, F. H. Green; secretary, D. M. Kent, and superintendent, William Rule. The company is now preparing for the extensive working of its ground by the hydraulic process.

SAN BERNARDINO COUNTY.

A company has been formed to work a deposit of cobalt in Lytle Creek canyon. The outcrop is said to be 6,000 ft. long and 10 to 20 ft. wide.

SHASTA COUNTY.

(From Our Special Correspondent.)

ANCIENT CHANNEL.—This gravel mine, on Indian Gulch, near Reid's Ferry, two miles from Redding, is being developed under bond by the Union Mines Company of San Francisco. A steam hoist and pump have been put in and a shaft is being sunk to reach the bedrock. Geo. Senn, of San Francisco, is in charge of the work.

HARTMAN.—At this mine, 3 1/2 miles north of Stella, six tunnels that have been run on the parallel ledges aggregate 2,000 ft. in length. One of these ledges is 25 ft. in width, carrying low grade ore, while the other is narrow but very rich. Enough ore is worked by an arastra to pay the expenses of development.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

SALMON RIVER HYDRAULIC MINING AND DITCH COMPANY.—This company has purchased the William Kline mine, at the mouth of the Jessup's Gulch, and will extend their ditch down to the claim. The mine has been opened by five cuts through the rim of the bedrock next to the river, and has elevation enough to give a good dump.

TRINITY COUNTY.

(From Our Special Correspondent.)

LA GRANGE HYDRAULIC MINING COMPANY.—The great syphon pipe line at Stewart's Fork has been completed. The syphon starts from a ditch 1,100 ft. up the mountain and runs down to a bridge built to carry the pipe across the stream, the line then runs up the mountain 1,000 ft. to a ditch which runs around the mountain. The pipe is 30 in. in diameter, built of boiler steel of different thicknesses, to withstand the great pressure. The water is to be turned on in a few days. The company has also given a contract to run a two-mile tunnel along the line of the ditch. William H. Radford is superintendent.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

JUNCTION.—At this mine on the Yost Ranch, one mile south of Soulsbyville, some rich ore has been encountered. After sinking 100 feet a drift was run toward the Black Oak mine 26 ft., which cut a 6-ft. vein of ore which milled \$125 per ton at the Black Oak mill.

YUBA COUNTY.

(From Our Special Correspondent.)

YUBA POWER COMPANY.—This company has been organized by a syndicate composed of R. R. Colgate, of New York; E. J. De Sable, Jr., and John Martin, of San Francisco. The power will be de-

rived from the Yuba River. The equipment will consist of three 500-H. P. generators, 3,000-H. P. step up and step-down transformers, and about 120 miles of copper wire. There are to be two stations, one at Brown's Valley and the other at Marysville. Contracts have been made to furnish power to the Sperry Flour Mills, the Webb Mining Company and many other companies.

COLORADO.

BOULDER COUNTY.

(From Our Special Correspondent.)

A railroad to connect Boulder with Ward and other mining camps is under way. Fourteen miles are graded, and the road may be finished to Ward by December 1st.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

BETSY B. MINING COMPANY.—This company has just been incorporated for \$250,000 to operate in Clear Creek and Gilpin counties. The mines are located at Yankee Hill. Incorporators are C. W. Mills, W. B. Palmer, C. E. Cowell, J. J. Armstrong and A. J. Fowler.

CENTENNIAL.—Drifting from the shaft at 400 ft. in this mine at Georgetown discloses some bodies of ore that will average about \$30 per ton.

CHESAPEAKE GOLD MINING COMPANY.—A Pennsylvania company, operating this group at Yankee Hill, has extended a tunnel to reach the more important lodes. At a distance of 300 ft. a rich blind lead was encountered.

CORNCRACKER COMPANY.—Since the consolidation of the Gold Dirt and Tenth Legion mines at Empire the work has been carried on through the Gold Dirt shaft at a depth of 500 ft. Under the development the mines are producing about 40 tons of ore per day.

FROSTBURG.—This mine, belonging to R. O. Olds, at Silver Plume, is reported to be in good ore through the working by leasers. The streak is 1 ft. wide and is claimed to run from 50 to 60% lead and high in silver.

GOLD MEDAL MINING COMPANY.—A Boston company is opening up this lode at Idaho Springs. Rich free gold was found at the surface, while at a depth of 300 ft. lead and copper ore with gold values is being encountered.

GRIFFITH MINING COMPANY.—This property at Georgetown is now working under the leasing system in most of the ground. An improvement in the production is noted. The values run 4 oz. gold, 60 oz. silver and 30% lead.

JOE REYNOLDS.—This mine, at Lawson, is now owned by Jay Morton, of Chicago, who fell heir to the "Diamond Jo" Reynolds property. For a long time the mine was operated by leasers, but Mr. Morton on assuming charge decided upon working the property himself. The shaft is down for 900 ft. and before resuming development he decided to connect some of the lower levels at another point for the purpose of having two means of egress in case of any trouble. It would also serve as an air-shaft and thus give better ventilation to the mine. In the lower level the streak is 2 ft. wide and runs high in silver.

NEWTON MINING COMPANY.—The property at Idaho Springs belonging to this company has been leased with an option to W. E. Renshaw & Company. They have put in a heavier pump.

PENNSYLVANIA MINING COMPANY.—A contract is being let for sinking the shaft on this property at Dumont. It is now down 300 ft. in a big body of milling dirt.

SEVEN-THIRTY.—It is claimed that the Bismarck lode of this group, at Silver Plume, is showing high-grade ruby and brittle silver.

SPECIE PAYMENT.—An Eastern company was recently organized for the operation of this mine on Bellview Mountain. A complete hoisting plant has been installed and sinking of the shaft was commenced last week. The ore runs about 5% copper, with gold values predominating.

STANDARD MINING AND MILLING COMPANY.—This company was organized early in the summer for the working of the Miller group of lodes near Idaho Springs. A new mill was erected before any ore had been blocked out. Air compressors were installed and the various lodes in the tunnel were drifted on. These commenced supplying the mill with 40 tons of ore per day. Although the ores had been tried at other mills with success the values at their own mill could not be recovered and the company was called upon to settle the indebtedness. The mine and plant of machinery had not been fully paid for and after falling behind as long as possible with the pay to the miners work was stopped and attachments were issued amounting to about \$10,000. Under the law of Colorado the mine is held responsible for the wages due miners, and because of this it is claimed by some that a scheme is on foot to so manipulate affairs that the company can gain control without paying \$60,000 which is yet due on the purchase price.

EL PASO COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

HERINGTON MINING AND MILLING COMPANY.—This company's lease on the Orphan Belle mine on Bull Hill is turning out to be a bonanza. The stockholders are nearly all employees of the Rock Island Railroad. The only stock that has been sold so far has been for the purpose of raising money for devel-

opment. About \$20,000 so far has been expended for machinery buildings and other development work. All drifting and crosscutting is done with the aid of compressed air. At present three shifts of 10 men each are being worked, but commencing on October 25th this force will be doubled. The Maloney vein on this property has lately been struck and the daily production now averages about \$1,000. The lease of this company expires April 1st, 1898.

MOON ANCHOR.—This property, on Gold Hill, made a very good showing for the four months to October 1st; the smelter and mill returns for that period aggregate about \$140,200. The expenses of running the mine and machinery and other improvements for the same time were some \$35,020, showing a gain over the expenses of about \$105,180. They have paid during this period in dividends \$42,000, and have on hand over \$90,000, besides upward of \$10,000 in ore mined but not settled for.

ORPHAN BELLE.—The final payment on the purchase of the Maloney lease on the Orphan Belle by A. L. Dickerman, trustee for an Eastern syndicate, was made October 20th. The amount paid was \$50,000, making a total of \$75,000 for the lease. Work on the property is being energetically pushed.

RIGI GROUP GOLD MINING COMPANY, LIMITED.—A new body of ore has been opened up lately, on the north end of the Rigi claim of this company, of which Baron von Richthofen is the lead; the property is managed by Charles J. Moore. This property is located on the east slope of Battle Mountain. The lessees have opened at a depth of 45 ft. a 3-ft. vein of ore, that will yield \$50 or better to the ton. Work will be pushed on this and the vein developed in good shape. On the part of the property operated by the owners ore has been encountered at a depth of 240 ft.; this is a continuation of the same chute that was opened up at a depth of 120 ft. Owing to the pitch of the vein, this will give 120 ft. of good stopping ground with a nice grade of ore. The showing for this property is good.

SANTA RITA.—On this property, on the west side of Squaw Mountain below the railroad track, development work has been pushed for some time, and the Messrs. Caley and others are taking out some good ore from the 250-ft. level and will shortly resume shipments.

GILPIN COUNTY.

(From Our Special Correspondent.)

PINE CREEK DISTRICT.—What is regarded as a very wise move is the fact that several of the biggest working properties in this section of the county have decided to keep up sinking operations all winter. Among the best known properties in this section which intend to reach additional depth are the Mascot, Plateau, Annie H., Manchester, Booster, Huberneck and Ingrain.

BUELL.—The Eastern syndicate operating this property has suspended operations and pumps have been pulled. It is reported that an offer of \$100,000 was made for the property, but the owners would not accept those figures.

CENTRAL CITY.—This property has been taken hold of by Pittsburg capitalists, who will operate it under the name of the Ross Gold Mining Company. The main shaft, 400 ft. deep, is being unwatered, after which development work will be carried out by running levels at that depth, and then sinking operations will be commenced. The new parties have taken hold of this property in a business-like manner.

ELK HORN GULCH.—Dr. Henry Paul, of this city, has a force of men opening up claims in this section and shipments have been made the returns from which were very satisfactory. They are located in the Russell Gulch district, but very little development work has been carried on in that section.

GILPIN TRAMWAY COMPANY.—New ore cars are being received by this company, which are compelled to work night and day, in order to take care of the increased ore output.

MANCHESTER.—This property is operated by the Red Cross Gold Mining Company, of Denver, which is thinking seriously of putting up a 50-ton mill near the mine, in the Pine Creek District, but it is thought that owing to the lateness of the season the building of the new mill will be left until next spring.

MAUD S.—Denver and Georgetown parties have taken a lease and bond on this and the Henrietta claims in Russell Gulch, and are preparing to prosecute a ctive development work during the winter months.

PACTOLUS HYDRAULIC MANUFACTURING COMPANY.—This company is operating placer property on South Boulder Creek below Rollinsville, and has a large plant of machinery. Upward of \$50,000 has been spent by the company, which will begin operations on a large scale next Spring. A clean-up of eight boxes gave returns of \$1,500 in gold, and it is expected they will have a clean-up from the 60 boxes some time about November 1st.

PHOENIX-BURROUGHS.—This property gives employment to 85 men, and its daily output is nearly 100 tons of ore, making it the largest single producer in this county.

ST. LOUIS-GUNNELL.—This property has been started up again by local parties, who are now engaged in taking out the water, after which they intend to send the shaft down from its present depth of 400 ft. to a depth of 600 ft. When formerly

operated some good grade ore was taken out, but it has been worked only in a small way since 1882.

SURPRISE.—Chicago parties have taken a lease on this mine in the Vermilion district, and after getting it in working shape are now shipping some ore of a fair grade. It is believed that a deal will be consummated on this property at an early date.

LAKE COUNTY.

(From Our Special Correspondent.)

BENTON.—This property is being operated by lessees, who are taking out some fine lead ore at a depth of about 350 to 400 ft. This find is also a new one and the stuff assays 40 to 60% lead, 25 oz. silver, and a small quantity of gold to the ton. They have, it is understood, but a small quantity of this character of mineral, which is now being hoisted into the ore bins. At the same time the strike has greatly encouraged the lessees, who are pushing prospecting work with the hope of catching the main ore body.

ELK.—The leasing company while pushing prospecting work is at the same time opening up and shipping from a fine body of iron ore. Shipments were increased this week to 40 tons per day, and this shipment will be further increased during the latter part of the month. The stuff runs from 5 to 7 oz. silver and about 44% excess. The ore is coming from the 110 and 287 ft. levels. Work is now being pushed on a new drift running to the south for the purpose of catching the Carbonate Hill ore chute. It is thought that by driving in about 120 to 150 ft. that a good lead ore body will be opened up.

MONTROSE COUNTY.

Rumors of a big find of copper ore in La Salle Canon are afloat. Fuller confirmation is awaited.

OURAY COUNTY.

AMERICAN GOLD MINING COMPANY.—This company's statement for the year ending October 1st, 1897, shows receipts as follows: Ore and mining, \$79,563; interest, \$559; Fowler smelter, \$564; total, \$81,686. Payments were: Ore and mining, \$37,527; office expenses, insurance and taxes, \$1,788; total, \$39,315. The profit for the year was therefore \$41,371, and from this the sum of \$30,000 was paid in dividends, leaving a surplus of \$5,371. Adding \$20,028 cash on hand at the beginning of the year, the balance on October 1st, 1897, was \$25,399. The output of ore was 522 tons, the average net value per ton being \$152. The total receipts given above were \$154.57 per ton, and the expenses \$75.32, leaving a net return of \$79.25 per ton.

From May 16th, 1896, up to October 1st, 1897, the company mined 6,687 tons of ore of an average value of \$140 per ton. The total receipts were \$934,988, and the amount paid in dividends was \$279,000.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

GEORGIA.—This property, in Arastra Basin, opened up a fine vein of good ore and immediately began regular shipments. The ore predominates in gold values.

GOLDEN SHEAR MINING COMPANY.—This company owns and is operating the Bonita, at the head of Bear Creek, and is now realizing handsome returns. Late prospecting has revealed a vein of very high-grade ore, in addition to the immense bodies of low-grade milling ore now in sight.

HENRIETTA.—Wyman et al., who have a contract for supplying the Silverton Smelter with large quantities of iron ore, have succeeded in cutting the Henrietta vein in a crosscut at a depth of several hundred feet.

ORO TUNNEL.—Work is being pushed and the property made snug for the winter.

PYRAMID.—Large bodies of ore are in sight and shipments are now made daily to La Dora mill. About 600 ft. of new track was recently laid from the breast to the surface. The vein in this property will be tapped by the Oro tunnel at a depth of 2,000 ft.

ROYAL TIGER.—Everything is now working smoothly and shipments average a carload daily to Denver smelters.

SIoux CITY & COLORADO MINING COMPANY.—This is a new company, with a capital stock of \$25,000. The principal office is located at Sioux City, Ia. The incorporators are J. H. Hamilton, Chas. Breun, E. H. Bruckman, A. Groninger, Wm. Orr, T. G. Cowgiel, Jno. Hornic, Edgar Buchram, C. R. Marks.

SAN MIGUEL COUNTY.

(From Our Special Correspondent.)

David Swickhimer, Walter Beam, A. J. Clark and other stockholders of the Japan Mines Company intend to construct an electric light and power generating plant at the foot of Keystone Hill, on San Miguel River, six miles below Telluride. Water for the operation of the plant will be taken from San Miguel River a short distance above the Keystone Placer Company's dam. A flume 30 in. square inside and 8,000 ft. long is now more than half finished. There will probably be a lawsuit over the water, the Keystone Placer Company, composed of New York City people, asserting that the promoters of the new enterprise have no right to take water from the river at the point they intend to, while the latter claim the Placer Company has forfeited its right to the water from non-use, the company not having worked the placer or utilized the water since 1892. The total length of the flume will give a head and fall of 500 ft. The object of the

plant is to supply the town of Telluride with lights and various mining companies with electric power.

BUCHANAN MINING COMPANY.—This company, operating in Ingram basin, has just completed a new boarding-house on the Lizzie E. claim and development work will be prosecuted steadily throughout the winter. A vein of the same size and character as the Cimarron and Columbia-Menona is being regularly opened up.

GOLD KING CONSOLIDATED MINING COMPANY.—The six or seven sets of lessees are taking out enough ore to keep the 40 stamps of the Gold King mill constantly dropping. The product is almost strictly free milling and reported to be averaging \$20 on the plates per ton. The mine is being operated to much better advantage than for several years past, when worked by the company, probably because the lessees are exercising greater care in sorting the ore.

PULASKI MINING COMPANY.—This company's experimental steam stamp mill, erected this summer in Bridal Veil basin, near the Pulaski group of mines, has been closed for the winter. The results obtained from the run of the mill were highly satisfactory, the mineral yielding from \$25 to \$40 per ton in gold, and it has been announced by one of the stockholders that a stamp mill of large capacity will be constructed next spring. Contracts for extensive development were recently let and a good force of men will be steadily employed in the property during the coming winter. The company is composed of New York and Chicago capitalists, George E. Harmon, of the latter city, being president and general manager.

ROCK OF AGES.—Painter & Rohmer, John Hart and John Haines, owners of this property, located in Navajo Basin, Mt. Wilson District, recently made a small shipment of the ore, which ran 292 oz. gold and 72 oz. silver per ton. A few weeks ago the vein was intersected 300 ft. below the surface by a cross-cut tunnel, and at the intersection 3 in. of this ore was uncovered. The streak has held its own in size and value with development.

SMUGGLER UNION MINING COMPANY.—The management is installing new machinery in the company's 50-stamp mill at Pandora, which will increase the daily capacity of the plant to 225 tons. Three or four sets of Cornish rolls will be put behind the batteries to pulverize ore coming from the sizers too coarse for the vanners. The mill has been principally supplied with mineral from the old dumps of the Smuggler-Union, Sheridan and Mendota mines the past summer. But as the dumps freeze it will again be supplied from the mines, which will necessitate the employment of about 200 additional miners.

TOM BOY GOLD MINES COMPANY.—The mill and upper workings of the Tom Boy mines were closed down October 16th. Over 200 men were thrown out of employment. It is not believed that the shut-down will be for longer than 30 days.

VALLEY VIEW GOLD MINING COMPANY.—This company will shortly commence driving a tunnel considerably below the lowest of the upper surface workings to connect with the winze from the fourth level, now down 300 ft., at a depth of 400 ft. The levels being driven on the vein from the winze are opening up from 10 in. to 5 ft. of free milling quartz that runs from \$20 to \$40 per ton.

GEORGIA.

CHEROKEE COUNTY.

(From Our Special Correspondent.)

SIXES GOLD MINING COMPANY, LIMITED.—The Atlanta Constitution has recently been publishing the prospectus of the Sixes Gold Mining Company (limited), incorporated under the laws of the State of Georgia and capitalized at \$500,000. The following have been named as directors: Hon. Henry B. Tompkins (ex-judge Superior Court, Savannah), Atlanta, president; Francis H. Orme, M.D., Atlanta, vice-president; H. F. Russell-Howland, Allatoona; Col. J. H. Moore, Canton; C. W. Hunnicutt (of Hunnicutt & Bellinger Company), Atlanta; A. B. Coggins, Canton (Mr. Coggins is the vendor of the property, and will join the board after allotment). The bankers are the Atlanta National Bank, Atlanta; attorneys and counsel, Tompkins & Alston, Equitable Building, Atlanta; mining and consulting engineer, Geo. P. Good, Southern States Mining Bureau, 407 Equitable Building, Atlanta; secretary, Gabriel T. Palmer; offices are in the Equitable Building, Atlanta.

A careful perusal of the prospectus, which is published in full in this advertisement, shows that it is principally made up of history, that, so far as the value of the property is concerned, the prospectus states that: "The directors have examined the property and have been strongly impressed with the high value of the ore there; that they have entire confidence that the working of the mine will be a credit to them." Further the prospectus states that "on August 26th, 1897, a special meeting at the mine was called for inspection and examination of the property by and on behalf of the directors. As only brief notice had been given of the proposed visit, there had been no time to pump the water from the shaft. Three pannings of the decomposed ore were made in the presence of the party, and every panning showed a large amount of free gold in the pan. Samples were taken and sent for assay to Messrs. George P. Good & Co. and the N. P. Pratt laboratory, of Atlanta, with the following results: George P. Good & Co., samples of decomposed ore, \$352 per ton; samples of coarse ores, \$34 per ton. N. P. Pratt

Laboratory, samples of decomposed ores, \$24.80 per ton; samples of quartz diorite ore, \$9.30 per ton; average of six samples assayed, \$79.83 per ton.

Space will not permit the reproduction of the entire prospectus, but it goes on to estimate the cost of equipping a mill, chlorination plant, etc., having the capacity to treat 80 tons of ore per day and then figures out a net profit of \$552,000 per annum, on the basis of an average value of the ore at \$25 per ton. It winds up with a reference to the profits on South African and Western gold mining camps and suggests a comparison between these and the gold mines of Georgia as being favorable to Georgia. Being somewhat acquainted with the conditions in Cherokee County, I would advise any prospective investors to investigate very fully the conditions at the mine with regard to ore in sight before making application for shares.

LUMPKIN COUNTY.

SINGLETON MINE.—This mine is reported sold to John B. Atkinson, of Earlington, Ky., who will work it.

RABUN COUNTY.

A discovery of monazite is reported to have been made in this county by State Geologist Yeates, of Atlanta.

RICHMOND COUNTY.

MUTUAL MINING AND MANUFACTURING COMPANY.—Charles W. Davis is at the head of this company, with offices in Augusta. He intends to work some valuable kaolin deposits near Aiken Junction, on the South Carolina & Georgia Railroad.

IDAHO.

OWYHEE COUNTY.

BLACK JACK.—Work is progressing rapidly on the station at the 100-ft. level of the new shaft. As soon as it is completed a cage will be put in and sinking resumed. A short crosscut will have to be run from the station to the vein.

TRADE DOLLAR.—The new shaft is now down about 265 ft. They are near the granite line. The mill is running at its full capacity. Large quantities of supplies are being laid in for the winter.

KENTUCKY.

COAL PRODUCTION.—Mine Inspector Stone of Frankfort says that complete returns from eight of the 11 counties composing this district, up to July 1st, 1897, show a decrease in the coal output of 32,505 tons. The largest loss is in Hopkins County, 15,079 tons. Union County is next with a loss of 9,653 tons, then Webster with 6,857 tons. There is a small loss also in each of the counties of Hancock, Daviess and McLean. Butler, with two mines, shows an increase of 479 tons, and Christian, with only one mine, the Empire, shows an increase of 2,102 tons. The reports from Muhlenberg, Ohio and Henderson counties are not yet complete. They will likely add considerably to the loss of tonnage. There were several hindrances in the early spring months, such as flooded mines and dull business, that seriously affected the output. These are now out of the way, and in view of the great activity among the mines Mr. Stone predicts that the losses of the first six months will be more than overcome during the last half of the year. This district produces nearly 60% of the entire coal output of the state. In the Southeastern district most of the mines are idle, and many of them have done no work since the first of May last. Probably the differences between the operators and the miners will soon be adjusted, and work will then be resumed.

MASSACHUSETTS.

ESSEX COUNTY.

PEABODY GRANITE COMPANY.—Incorporation papers were recently filed by this company with Benjamin M. Cram, president; Joseph M. Parsons, treasurer; Samuel N. Davis and George W. Davis, directors. The capital is \$16,000.

MICHIGAN.

COPPER.

KEARSARGE MINING COMPANY.—At the special meeting in Boston, October 26th, the stockholders voted unanimously to approve the agreement for the sale of the company's property to the Osceola Mining Company for 25,000 shares of that company's stock.

OSCEOLA MINING COMPANY.—At the special meeting in Boston, October 26th, there were 38,852 shares represented. The stockholders voted unanimously to authorize an increase in the share capital from 50,000 to 100,000 shares and also authorized the directors to purchase the real estate and personal property of the Kearsarge and Tamarack, Jr., Mining Companies, under the terms of the agreement which has already been published. President Bigelow stated that as soon as the consolidation goes into effect orders will be given to increase the stamping capacity. Work will not be started until spring, but plans will be arranged during the winter so that the increased stamping facilities can be quickly erected.

TAMARACK, JR., MINING COMPANY.—At the special meeting in Boston, October 26th, the stockholders voted without dissent to approve the sale of the company's property to the Osceola Mining Company for 16,000 shares of that company's stock. There were 31,512 shares represented at the meeting.

IRON—MARQUETTE RANGE.

The Miners' Union at Negaunee has made a de-

mand for an increase of 15% in wages. The operators will pay no heed to the union. As the Queen, the largest employer of labor, talks of closing down for the winter on account of the high royalties and the stocks of ore are all shipped, a strike now would accomplish little.

MINNESOTA.

(From Our Special Correspondent.)

Mines are rapidly closing down for the season, and the ore movement after November 1st will be very slim. Only about 8,000 tons a day are moved from the docks of the Duluth, Missabe & Northern, and a dozen vessels carry all the week's ore from Two Harbors for the Duluth & Iron Range. No ore is going by the Duluth, Superior & Western. Freight rates are unchanged at 65c., and the earlier predictions of high fall figures are sure to be in error.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

Winston Bros., of Minneapolis, have taken a contract for raising and double tracking three miles of the Duluth & Iron Range line near Biwabik.

F. R. Green, of Fredonia, N. Y., has transferred to the Nashwank Iron Company, for a stated consideration of \$330,000, the Gross property west of the Auburn mine. Not long ago the property of the Roucheleau Ray Iron Land Company. What the price was is not actually known, but it is not probable that it approached the figure given, as the property, though prospectively a fine mine, is not so as yet.

The Great Northern Railway has filed its statements of intention to build the Fosston cut-off, a line 220 miles long from its western main line to the head of Lake Superior direct. The road will pass within 15 miles of the Hibbing group of mines, and may become a factor in ore traffic, and it crosses almost exactly the group of prospects north of Grand Rapids which are known as the Diamond mines, and where some ore has been discovered. The line will be built this winter.

BIWABIK BESSEMER COMPANY.—This company has closed down for the season with a total output of 425,000 tons, considerably less than was anticipated earlier in the year. With the close of the Biwabik not a wheel is turning around Biwabik location.

CLOQUET IRON COMPANY.—This company, whose mine has been idle all season, has put a steam shovel at work in the stocked ore and will endeavor to ship as much as possible before the season closes.

LAKE SUPERIOR MINES.—About half the 70,000 tons in stock here have been shipped, and a shovel is steadily at work on the balance, and it will be cleared away before winter. About 45 cars are shipped daily from the Hull, and the mine presents a remarkably busy appearance.

MAHONING ORE COMPANY.—This mine has closed for the season, but stripping is going on and will continue as late as possible with a force of not far from 200 men. Next year's output is now estimated at about 800,000 tons.

MOUNTAIN IRON MINE.—This mine has closed down for the season, with shipments of 765,000 tons, making it the greatest mine of the year on the Lake Superior ranges. All mining ore has been done by one shovel, a 92-ton Vulcan with a dipper capacity of 62 cu. ft., or 5 tons. One day in June, with a bank of 18 ft. to work against, this shovel loaded 6,524 net tons of ore in 10 hours, and in that month 164,000 tons.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

It is still stated that the Carnegie interests are after the Pioneer mine at Ely, but that the hitch comes from the fact that the leaseholders, who have but nine years more of control, are refusing to give away and permit any negotiation between the fee owners and the intending buyers. The lessees have a small minimum but a high royalty, and are after a 20-year extension, which is what the Carnegie people demand. They want to hold their lease at a lower figure and to sub'let at a higher price, but the feeholders think that if there is any fat in the deal they ought to have it, and probably will. A bonus of a large sum, \$1,000,000 being talked of, for the lease would be a very rich plum for the lessees if they are able to block the transfer until they are settled with.

CHANDLER IRON COMPANY.—This mine has ceased shipments with a total of about 450,000 tons for the season and a stock pile left of about 200,000 tons more. It is now engaging men for the night shifts, which have been idle for some time, and will work 600 through the winter. Its shipments for next year are expected to be not much below 600,000 tons.

PIONEER IRON COMPANY.—This mine also has ceased shipments to docks, with a large stock pile on hand. It is now mining for stocking. Some 300 men are at work, and will, it is now expected, be continued all winter.

SECTION 26.—This new mine, of great promise, is now stocking some ore, and is adding to its force as fast as there is place for the men to work.

MISSOURI.

JASPER COUNTY.

GRAND MASTER MINING COMPANY.—This company has been sinking a new shaft. At 107 ft. they developed a good run of lead ore, and at 140 ft.

opened up a large body of pebble zinc ore, both in soft ground with very little water.

NEBRASKA MINING COMPANY.—At the mine on the Becky Sharp lease this company has just completed a steam rougher, and are making over six tons of pebble zinc ore every nine hours. They are drifting at 140 ft., on a 16 ft. face of ore in timbering ground, with only enough water to wash the ore.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—To-day closed another active week in the mines. The demand for both lead and zinc ore was good, and the entire production was cleaned up by the various ore buyers. The increase over the preceding week was five carloads of zinc ore and two of lead ore, yet the increase in value was but \$83. Lead ore sold at \$24.50 per 1,000 lbs. delivered all week, a falling off of \$2 per 1,000 lbs. The top price paid for zinc ore for the week was \$23 per ton, four cars of Joplin ore bringing this price and one from Webb City. Oronogo, Stott City and Springfield received \$22.50 as best price, while the balance of the district received from \$22 down, according to grade. The increase in the output over the corresponding week of 1896 was 35 cars of zinc ore and 12 cars of lead ore, representing in money \$40,329. Last year for the corresponding week the top price for zinc ore was \$21.50 per ton, and for lead ore was \$14.50 per 1,000 lbs. delivered. Following are the sales of lead and zinc ore in the different camps for the week ending October 23d: Joplin, zinc, 1,193,740 lbs.; lead, 404,980 lbs.; value, \$22,851. Carterville, zinc, 1,198,800 lbs.; lead, 305,140 lbs.; value, \$19,311. Webb City, zinc, 705,460 lbs.; lead, 82,620 lbs.; value, \$9,037. Galena, zinc, 3,270,000 lbs.; lead, 481,120 lbs.; value, \$42,612. Aurora, zinc, 743,000 lbs.; lead, 26,000 lbs.; value, \$6,036. Stott City, zinc, 215,540 lbs.; value, \$2,833. Oronogo, zinc, 197,440 lbs.; lead, 5,280 lbs.; value, \$2,325. Springfield, zinc, 46,000 lbs.; lead, 49,000 lbs.; value, \$1,682. Belleville, zinc, 19,840 lbs.; lead, 5,740 lbs.; value, \$356. District totals for last week: Zinc, 7,625,640 lbs.; lead, 1,354,740 lbs.; value, \$106,979. District totals for 43 weeks: Zinc, 282,845,050 lbs.; lead, 48,201,920 lbs.; value, \$3,612,166.

GROUNDS & IRWIN.—This mine, at Duenweg, made a big record for the week; the output for each day for a 12-hour shift amounted to an even carload of 22 tons of zinc ore. On several occasions a carload of zinc ore has been made, but it never has been done before for a whole week. The company have a lease on 80 acres, and this plant and mine is on the east 40. On the west end of the lease the firm has four fine looking prospects in good ore. They have let a contract for another large steam concentrating plant.

HUTCHINSON MINING COMPANY.—This company has leased 80 acres of the G. B. Young land three miles southwest of Joplin. Six hundred feet of drilling has been done and eight holes put down. The last hole developed good lead and zinc ore at 52 ft., which continued to 70 ft. The other holes showed pay dirt at the same depth. There are 11 shafts going down on the lease, all of which is in soft ground, easily and cheaply opened up.

LOCUST MINING COMPANY.—This company is drifting at 110 ft. on a good run of lead ore in open ground, and is producing about 20,000 lbs. of lead ore per week. It has a large face of zinc ore at 147 ft. in hard ground.

McKEE & CONNOR.—On the Brinkley lease, near Webb City, these parties are finding very rich dirt, and last week made and sold over 22 tons of zinc ore and 12,000 lbs. of lead ore, which they cleaned on hand jigs.

PELICAN MINING COMPANY.—On the Leonard land they have put in a 100-H. P. boiler, 14-in. crusher, a set of rolls, and five hand jigs to clean the ore; also a 3-in. discharge Worthington pump to drain the ground and furnish water to wash the ore. They are drifting at 145 ft. on a large face of zinc ore and last week they made 30 tons of zinc ore. They went through a good run of lead ore at 105 ft., but are not working it at present. They are now fixed to put in a complete concentrating plant with the addition of steam jigs and an engine to run them. This property is owned by Chicago parties.

PLEASANT VALLEY MINING COMPANY.—On this company's land, near Carthage, last Tuesday in sinking a new shaft at 10 ft. they struck rich lead dirt, and in sinking that afternoon they took out 500 lbs. of lead ore.

RAYVILLE.—At Rayville, the new mining camp east of Joplin near the Newton County line, about 30 new shafts are going down and next week there will be several more started. Moss & Company have opened up a good lead ore prospect at 32 ft. Grubb & Company have another fine lead prospect. Shafer & Company have opened up a lead ore prospect at 20 ft., and Saturday took out 700 lbs. of lead ore while sinking. In a number of other shafts they are getting good lead sluices in open ground. A big shaft was started last week and will go down deep enough to get water to wash the ore.

ROSE LEAF MINING COMPANY.—This company has four acres on the John H. Taylor land west of Joplin where the shaft is down 140 ft. with a good zinc ore prospect in hard ground which has been worked for some time. Saturday, at 60 ft. from the surface, one of the miners noticed some lead ore in the cribbing. A drift was started and in a short distance opened up a 5-ft. face of lead ore in open ground.

THREE FRIENDS MINING COMPANY.—This company has a lease on 120 acres of land one mile north of Belleville, and has laid it out in mining lots; nearly every lot is taken. There are 86 prospect shafts going down on the lease, and in 30 shafts they are getting lead and zinc slimes at 30 ft. in slate ground. The company's shaft is down 60 ft. The company is putting in three pump shafts to drain the land.

WILTERMOOD BROTHERS.—On the White Oak lease, east of Joplin, they are drifting at 75 ft. on a good face of lead dirt in soft ground and are producing over 10,000 lbs. of lead ore weekly.

WRIGHT, LANE, PHILLIPPI & COMPANY.—This company has opened up the Burlington mines on the Granby land, and is now producing about 20 tons of zinc ore and 15,000 lbs. lead ore weekly. Drifting is going on at 130 ft. on a large face of lead and zinc ores in hard ground.

ZENITH MINING COMPANY.—A new shaft at the head of the drift for air has struck a rich body of lead and zinc ore. A steam concentrating plant is in place. A 12-ft. stope, starting from both shafts, will turn out over 50 tons of zinc ore and 15,000 lbs. of lead ore weekly.

MAGON COUNTY.

KANSAS & TEXAS COAL COMPANY.—This company has leased Loomis mines Nos. 4 and 7 at Bevier, and will operate them in connection with its other plants in this county. This will make five mines operated by the company in this county.

MONTANA.

BEAVERHEAD COUNTY.

GRASSHOPPER CREEK.—The dredges on this creek, in the old Bannock fields, are reported to be paying well.

FLATHEAD COUNTY.

KENTUCKY & MONTANA MINING COMPANY.—This company is reported to have built during the past year a 400-ton concentrator. An electric plant has been put in for both mine and mill, and a tunnel run 1,000 ft., tapping the ledge at a depth of 700 ft. below the surface. The concentrates have been contracted for by the United States Smelting and Refining Company, of Great Falls.

GRANITE COUNTY.

HOPE MINING COMPANY OF ST. LOUIS.—This company will pay another dividend of 10c. a share on November 1st. This will make a total of \$732,252 paid in dividends by the company up to date.

JEFFERSON COUNTY.

BIG TIZER MINING COMPANY.—This company has shut down for the winter. One hundred and sixty acres more of placer ground have been taken up.

BUCKEYE.—At this mine, two miles southwest of the Porphyry dike, the new 40-ton concentrator is proving a success, says the *Helena Independent*. The property is under bond to a Cleveland, O., syndicate, and it is supposed that it is the intention of the company to take up the bond, as it has built the new concentrator. The Buckeye has a large lead of base ore, running about \$15 a ton in gold, silver and lead. There is a large amount of ore on the dump with plenty more in sight in the mine. About 25 men are employed by the company.

MADISON COUNTY.

HAWKEYE.—At this mine, in Dry Georgia, the work of development is going on with N. Trauffer as superintendent. The property is under lease and bond to the Montana Mining & Smelting Company.

MEAGHER COUNTY.

JUDGE.—Work at this mine, which is located near Castle, is progressing. A force of miners began to lower the shaft two months ago and the work will be continued until the 350-ft. level has been reached, when prospecting for the vein will be prosecuted. The best of the ore taken out of the 250-level went as high as 60% lead and 29 oz. of silver. It is proposed to learn just what the vein amounts to and, if the showing will warrant it, the force will be increased and the mine developed.

MISSOULA COUNTY.

IRON MOUNTAIN MINING COMPANY.—The September statement of this company is as follows: Delayed returns for shipments in August, \$14,953; ore sales for September, \$5,996; cash on hand September 13, \$12,465; balance in the treasury, \$22,436.

PARK COUNTY.

BUTTE & YELLOWSTONE COAL AND COKE COMPANY.—This company, under direction of Manager A. O. Newton, is taking steps to increase the output of coal and erect ovens for the manufacture of coke. Engineer Crookes is engaged in surveying a route for a spur railway from the mines to Cinnabar. Bids are being advertised for the erection of a number of coke ovens now.

SILVER BOW COUNTY.

NETTIE MINE.—This mine, once a silver producer, will stop work entirely November 1st, it is said.

(From Our Special Correspondent.)

ALICE SILVER MINING COMPANY.—Despite the low price of silver this company announces a second dividend for this year of \$20,000, payable October 25th. At the Alice, Blue Wing, Magna Charta and Valdimere men are at work opening up new ground, which at the Blue Wing in particular is producing high-grade ore. Over 100 men are employed, about one-half of whom are lessees.

ANACONDA COPPER MINING COMPANY.—This

company's bottom workings, 1,600 ft. deep, prove the continuity so far of the ore bodies. At the Green Mountain 5% copper ore has been cut in the shaft at the 1,600-ft. level.

BOSTON & MONTANA CONSOLIDATED MINING COMPANY.—This company is making preparations to work on a larger scale. At the different mines about 1,400 tons of ore are hoisted daily. At the Atlantic mine prospecting with the diamond drill is in progress.

BUTTE & BOSTON CONSOLIDATED COPPER MINING COMPANY.—It is rumored that this company will commence to run its smelter now under lease to the Boston & Montana, about the first of next year on its own ore. At the East Grey Rock a powerful engine is in place on the 1,400-ft. level to sink with, as soon as the pumps on the 1,400 and 700-ft. levels are started. At the Blue Jay sinking is in progress below the 700-ft. level; some 15% to 20% ore is being hoisted.

COLORADO SMELTING AND MINING COMPANY.—At the Gagnon mine sinking is in progress below the 1,500-ft. level; the usual quantity of ore is being hoisted. At the Philadelphia mine about 20 miners are employed mining silver ore; there are large reserves in this mine, but the company does not see fit to work it to its full capacity.

MONTANA ORE PURCHASING COMPANY.—This company has purchased for \$250,000 a one-half interest in the Snohomish claim from the heirs of the late Wm. McNamara; the other interest is owned by the Butte & Boston Mining Company.

MOULTON MINING COMPANY.—Dividend No. 19 of \$20,000, or 5c. a share, has been declared, payable October 20th, 1897, by the State Trust Company, New York City.

NEVADA.

ELKO COUNTY.

(From Our Special Correspondent.)

YOUNG AMERICA GOLD MINING COMPANY.—A new company whose articles of incorporation were filed with the Secretary of State, at Salt Lake, Utah, October 13th. Capitalization, \$200,000; shares \$1, of which 50,000 shares are set apart for treasury needs; stock is assessable. Officers and directors are: W. B. Andrew, president; S. D. Evans, vice-president; R. L. Andrew, secretary; R. H. Officer, treasurer; C. B. Jack, all of Salt Lake. Annual meeting, first Tuesday in October. The realty consists of Young America East, in Tuscarora Mining District. The ground is next to the Dexter; exploration is being advanced under favorable auspices.

LYON COUNTY.

At Horseshoe Bend, on the Carson River, 24 miles above Carson, an extensive gravel gold deposit has been more or less prospected for the last three or four years, but without paying results, it being very fine float or drift gold, difficult to save and with but little fall for washing and drainage. A shaft has been started to test its deeper aspect and possibilities.

STOREY COUNTY—COMSTOCK LODGE.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—At the annual meeting, held in San Francisco October 18th, there was one change in the board of directors, Eugene Gauthier being elected in place of John W. Twigg, resigned. The board as now constituted is composed of Charles H. Fish, Nat. T. Messer, Thomas F. Fish, H. Zadig and E. Gauthier. The old officers were re-elected as follows: Charles H. Fish, president; Nat. T. Messer, vice-president; A. W. Havens, secretary; D. B. Lyman, superintendent, and Nevada Bank, depository of funds.

The report of operations during the fiscal year ending September 30th, 1897, of the superintendent, D. B. Lyman, shows that the 12 months ending on that date there was produced from the 1,550, 1,650 and 1,750 levels of the mine 2,900 tons of ore, which yielded bullion of the gross assay value of \$104,136, of which \$46,371 was gold and \$57,765 was silver. The average yield of the ore in bullion was \$35.89 per ton. The coin value of the bullion produced was \$73,295. In August, 1897, there was shipped to Kinkead mill 212½ tons of low grade ore to be crushed and concentrated. This ore yielded 6 tons and 553 lbs., dry weight, of concentrates, which amount was shipped to the Selby Smelting and Lead works for treatment, and yielded bullion valued at \$2,196, which showed an average yield of \$6.60 per ton. This bullion carried \$1,378 in gold and \$818 in silver. The coin value amounted to \$1,600. The rest of the superintendent's report is a statement of the work done in the mine, as has been described in the weekly reports. The company had an overdraft at bank on October 1st, 1897, of \$1,500, less \$463 cash on hand, and all bills paid to that date.

EXCHEQUER MINING COMPANY.—At the annual meeting, October 19th, 90,000 shares were represented and the old directors re-elected, with Charles Hirschfeld as president, Charles E. Elliot secretary and A. C. Hamilton superintendent. The company has about \$900 on hand.

WHITE PINE COUNTY.

(From Our Special Correspondent.)

GOLD CROWN MINING COMPANY.—This is a new company with principal office in Salt Lake, Utah, Capital stock, \$150,000; shares, \$1. Annual meeting second Monday in July. Officers and directors till next July are: Henry Siegel, president; Elisha H. Osborne, vice-president; Joseph Siegel, secretary.

treasurer; Solomon Siegel, Simon Davis, Messrs. Davis and Osborne reside at Aurum, Nev.; the others at Salt Lake. Realty consists of Gold Crown Nos. 1, 2, and 3 lode claims in Schell Creek mining district.

NORTH MOUNTAIN.—Damage from the recent fire, which burnt the timbering to a depth of 150 ft. in shaft and upper levels, is being repaired. Meanwhile slow headway is made in the mill, which is almost at a standstill. Rains have made the dump material—being put through until ore extraction was resumed—bad for leaching. The crushing capacity has proven of less tonnage than estimated, and some additions are contemplated. So far as winning the values are concerned, the ore is found to be excellent for cyaniding, the gold loss more often running under 10% of the assay than over. W. S. Brown, one of the directors, is now on the ground making up a report and estimates of the needed changes and repairs.

NEW MEXICO.

GRANT COUNTY.

SURPRISE MINE.—This mine is making regular shipments of lead ore. The ore body is large.

SUMMIT.—The London Company which has been developing this group has stopped operations.

TAOS COUNTY.

SHOSHONE MINE.—The shaft is down 115 ft. The vein is 6 to 10 ft. wide and runs over \$15.

NEW YORK.

COLUMBIA COUNTY.

BERKSHIRE GRANITE COMPANY.—This company, of Hudson, was recently incorporated with a capital stock of \$20,000. The directors are Thomas Burnie, of Chester, Mass.; Henry M. Macrea and Ada M. Macrea, of Hudson, N. Y.

OHIO.

ONEIDA COUNTY.

A strike of natural gas at a depth of 890 ft. is reported from Rome, on the premises of J. S. Haselton, of the Rome Brass & Copper Company.

SCIOTO COUNTY.

HENLEY STONE COMPANY.—With a capital of \$10,000, this company, of Henley, was incorporated to mine stone. The incorporators are John Peebles, Richard R. Peebles, Charles T. McDonough, Thomas N. Martin and Robert Peebles.

OREGON.

GRANT COUNTY.

BLACK BUTTE QUICKSILVER CLAIMS.—It is reported that this entire group of claims has been sold to a syndicate represented by Campbell Brothers, of Port Blakeley, Wash., and that the purchasers will at once begin to develop the property. The claims cover an area of 320 acres.

JOSEPHINE COUNTY.

OAK FLAT.—The ditch from Soldier Creek to the opening of the mine, at Illinois River, is completed; a new hydraulic derrick for handling boulders is ready, and active mining will soon begin.

PEACOCK MINE.—This property has been sold to a San Francisco company which will put in a 10-stamp mill immediately.

RUBY MOUNTAIN MINE.—This property is reported sold to Spokane parties for \$25,000.

LANE COUNTY.

MUSIC MINE.—The five-stamp mill at this mine ran steadily from the middle of May to October 1st. The clean-up is said to be \$30,000 in bullion and concentrates.

PENNSYLVANIA

ANTHRACITE COAL.

JERMYN & COMPANY VS. ELLIOTT, McCLURE & COMPANY.—The court at Scranton recently took up this important case, which affects the title to some valuable coal lands in Lackawanna Township and the coal mined from the same. The plaintiffs contend that the defendants mined nearly 400,000 tons of coal upon their property, about 300,000 tons of which they had a right to take, 75,000 tons being clandestinely taken for which the plaintiffs wish to recover.

It is stated that there was a parol agreement about the exchange of coal lands between the parties interested. The plaintiffs say that they agreed to exchange 17 acres to the defendants for 21 acres of their land. The defendants say that according to the parol agreement they exchanged 100 acres of land with the Jermyns for 17 acres. The parties are mining coal side by side. Mr. Jermyn admits that he gave the defendants permission to mine coal upon certain lands of his, but they went further than he had ever consented to. The master in his report found that the defendants had taken between 60,000 and 80,000 tons of coal that they were not entitled to and gave the plaintiffs an award in the sum of \$10,000, allowing a little over 10c. a ton for the coal. The defendants claim that they were entitled to a decision from the master, and the plaintiffs think that the amount allowed them is too small, so both appealed from the decision of the master.

BITUMINOUS COAL.

BERWIND-WHITE COAL MINING COMPANY.—This company has placed contracts for the construction of a water-works system at Windber, Pa. Keenan & Company, of Greensburg, Pa., will build the reservoir and lay the pipes, and the National Foundry & Machine Company, of Scottdale, Pa., will furnish the materials.

ARMSTRONG COUNTY.

The Philadelphia Company has struck a large gas well on the Day Farm, in Plumb Creek Township, about eight miles from Kittanning, which is claimed to have shown a pressure of 300 lbs. It is said to be the largest well ever found in the eastern part of Armstrong County, and opens up a new territory.

MONTGOMERY COUNTY.

There continues to be considerable talk of the occurrence of gold in this county. A dispatch recently sent from Pottstown states that gold ore worth \$10.26 a barrel has been found on B. M. Yost's farm near Sassamansville. The discovery was made by John W. Bauman, who was digging a well on the property. Desher Bros., of Belvidere, N. J., have secured a 25 years lease on the property. Reports of this kind have been circulated at intervals for many years.

WYOMING COUNTY.

Operations for testing for fireclay on the mountain in Forkston are in progress. Some of the property there adjoining the Stark land is owned by Dr. H. F. Lobeck, another piece by Lyman Brothers, of the New Age, and another by George F. Kutz. Recently the Lyman Brothers and Mr. Kutz had a diamond drill shipped there to test the land. The bed of fireclay is 8 ft. thick.

SOUTH CAROLINA.

It is stated that receipts from royalty on phosphate rock by the State Treasurer for the nine months ending September 30th, 1897, were as follows: January, \$10,397; February, \$1,229; March, \$5,498; April, \$6,599; May, \$1,375; June, \$2,389; July, \$7,400; August, \$1,700; September, \$2,599. This shows a total of \$39,186, or an average per month of \$4,354. The amounts were received from the Beaufort Phosphate Company, the Coosaw Mining Company, the Farmers' Mining Company and James Reid.

SOUTH DAKOTA.

LAWRENCE COUNTY.

At the cyanide plant at Deadwood, which has been leased by D. C. Boley, representing a company of capitalists of Chicago, a wing is being built on the east side for a cooling-room, and two roasters and a dryer have been purchased from the Consolidated Milling Company's chlorination plant. Mr. Boley and his associates are also working a force of men at their newly purchased mines on the Black Tail divide, taking out ore and storing it to be ready for the cyanide plant when completed.

The Huntington mill, recently built by Emil Faust and associates on the mill site in Black Tail gulch, is finished. The building is 32x48 ft., and has a capacity of 80 tons a day. It requires 3,000 in. of water less than a stamp mill of the same capacity, it is claimed. It is equipped with a large gasoline engine and with a waver, invented by O. Varney, a millwright, which agitates the pulp in such a way as to release the metal.

APEX.—P. H. Smith and Michael Power have transferred the Apex group of claims, adjoining the Hardin, to John Walker, of Chicago.

DEADWOOD & DELAWARE.—This company will sink a new shaft on the broad gauge or Spearfish branch of the Burlington & Missouri River road. The advantages will be in getting coal and timbers direct without a transfer. The shaft will be near Hall's old ranch and will be sunk to a depth of about 500 ft.

GOLDEN REWARD.—This company has resumed operations again at the chlorination plant. This plant is treating about 140 tons of ore a day which yield nearly \$90,000 a month.

HARDIN MINING COMPANY.—The ore body at this company's shaft is said to be 22 ft. thick.

HERCULES.—T. L. McKinnon, J. Lawrenson, H. L. Sanderson and others have sold the Hercules group of claims to Chicago parties.

HOMESTEAKE.—It is reported that the company will build a railroad from Lead City to the coal-fields at Cambria, Wyo. The road will be about 30 miles long.

UNION HILL COMPANY.—This milling company, it is said, is about to erect a 1,000-lb. 180 stamp mill. The motive power will be a 500-H. P. cross-coupling Corliss engine. The foundations for the battery are already in place, and the framework up.

UNCLE SAM.—According to local papers, Dr. Carpenter, manager of the Deadwood & Delaware Company, says that a new company has been organized of Eastern Pennsylvania capitalists who will purchase the Uncle Sam mining property and mill on Elk Creek, and will operate the property, commencing probably in the near future. The property is now in excellent condition, being absolutely free from debt and encumbrances. Although the old-time checks and other claims against the property were outlawed, Dr. Carpenter has settled them all in full, paying the last one, of Adams Bros., yesterday. It amounted to \$4,400, principal and interest. The debts and claims paid aggregated \$62,000.

TEXAS.

LLANO COUNTY.

Col. A. C. Schryver, of San Antonio, Tex., who recently discovered a gold mine in this county, has received returns from the first carload of ore shipped to a Denver smelter. The returns are said to be very satisfactory. The result of the shipment has increased the excitement over the discovery and

a number of prospectors have gone into the new field. Colonel Schryver has just shipped another carload of ore.

UTAH.

(From Our Special Correspondent.)

EIGHT-HOUR LAW.—Last week the case of A. F. Holden, plaintiff in error, vs. the Sheriff of Salt Lake County, involving the constitutionality of the Utah eight-hour law for miners, was argued in the United States Supreme Court. The case came from the Utah Supreme Court, where Holden was convicted for employing a miner 10 hours, in the Old Jordan mine, and was fined \$50 and sentenced to serve 57 days in jail. On the trial Holden pleaded not guilty in that the miner voluntarily engaged to work 10-hour shifts; that the facts charged do not constitute a crime; that the State statute is repugnant to the constitution of the United States, as it prevents employer and employee from making contracts in a lawful way for lawful purposes; that it is a class legislation depriving the defendant of property and liberty without due process of law. Upon conviction Holden filed a petition in the Utah Supreme Court for a writ of habeas corpus, which the Court denied, whereupon it was brought to the United States Supreme Court on a writ of error, setting forth that the Utah Court erred in holding the law constitutional. It is a test case of importance and the ruling of the United States Supreme Court is awaited with interest.

October showed a marked change in the ore supply, both as to character and quantity. The stoppage of production among dry mines, which has been quietly going on for two months or more, was not seriously felt until the past 10 days, though it is at present a cause of manifest perplexity at the different smelting works. The rather remarkable condition exists of silica at a premium and buyers actively competing for each car of ore carrying excess silica and little or no lead, which comes to this market. This means reduced treatment charges for dry ores, which in a manner helps out the distinctive silver mines. It is evident Colorado smelters are experiencing the same difficulty, but in a less degree, from the presence here of their representatives in search of dry ores. This is another straw indicating the seriousness of the inroads made by the cyaniding and chlorination plants on the portion of Cripple Creek's output which formerly found its way to the smelters. So far as concerns the Utah situation, the outlook appears a little brighter for dry mines, and if the railroads would reduce freight tariffs to correspond with the ruling conditions there probably would be no lack of silicious products, at least so long as silver continues above 55c. However, as matters stand, it is a moderately safe forecast that more men will be employed in the mines of the State the first of December than in the last week of October. At all events, unless lead drops below \$3.50, the worst of the current depression is at an end. Even in Park City affairs are slowly mending, and the mine pay rolls show more men at work than in September.

SHIPMENTS FROM SALT LAKE.—During the week ending October 23d there were sent East: 41 cars, or 1,518,065 lbs. lead-silver bullion; 35 cars, or 784 tons, lead-silver ore.

JUAB COUNTY.

(From Our Special Correspondent.)

AJAX.—Annual stockholders' meeting, on Monday, 18th instant, was adjourned for 60 days, without transacting any business, to await the outcome of the suit, instituted by Samuel McIntyre, involving the voting power of 40,000 shares, on which hinges the control. The troubles among the large shareholders continue to delay desirable exploration.

EMERALD.—Following close on the heels of the last reported strike comes an assessment levy of 2/3c. a share, delinquent November 15th. There is no more favorable neighborhood for deep prospecting in and around Mammoth Hollow than in Emerald Territory.

FOUR ACES.—At the adjourned meeting of the directors, on October 18th, the auditing committee's report showed a floating debt of \$2,000, besides \$5,000 secured. It is decided to have a specially called stockholders' meeting, as soon as possible, to act on the proposition to amend the incorporation articles, making the shares assessable.

GRAND CENTRAL.—A car of gold ores of high grade, carrying \$229 gold, 5 oz. silver, per ton, was marketed last week in Salt Lake. It is said two cars of the same sort of rock will be sent out this week. The champions of the property affirm that it will continue a regular shipper.

LOWER MAMMOTH.—Shaft is being straightened and thoroughly timbered preparatory to ore extraction. Shipments will begin about November 1st.

SWANSEA.—An effort is here being made to find the north extension of the Swansea vein. Shaft 200 ft., power a whim, no ore as yet. Development is advanced by 3 shifts.

TINTIC SHIPMENTS.—During the week ending October 23d the following lots of ore were forwarded from the district: Humbug, 7 cars; Gemini, 12 cars; South Swansea, 5 cars; Grand Central, 1 car; Mammoth, 5 cars. The Sioux Mill shipped 2 cars concentrates; Eureka mill, 12 bars bullion. From the Dragon Iron was sent 7 cars of hematite for fluxing.

MILLARD COUNTY.

(From Our Special Correspondent.)

CHICAGO PUMICE COMPANY.—A steam plant is

being installed to crush the product of the mine—rather quarry—for there are no limiting walls or enclosing strata. It is situated two miles from Black Rock on the Oregon Short Line Railroad, and is said to be the most extensive pure pumice depot in the world and the only one yet discovered on the Western Hemisphere. President William Quigley is now on the ground getting ready a shipment of five carloads, the largest yet sent out. In the past the product was shipped crude, as broken, mostly in pieces of considerable size. Owing to its lightness it is impossible to load a full carload, in weight; hence, to overcome this drawback, the material, hereafter, will be crushed and sacked and in this form shipped to the manufactory at Chicago. It is the anticipation in the near future to ship pumice by trainloads, which Mr. Quigley says will be necessary from the way orders are coming in. A warehouse and storage shed are being built at the railroad to protect the pumice from the elements. By the new tariff schedule there is a duty of \$6 a ton on imported crude pumice. In a very short period the company hopes to supply not only the entire home market, but to enter into competition in other fields. The realty consists of 80 acres, 40 of which form a miniature mountain of solid pumice stone, which is opened and worked exactly like an extensive quarry. So far as development has advanced there is practically no waste. The general office and works of the company are at Sixteenth and Loomis streets, Chicago, where the marketable products are supplied to the trade.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

ARGONAUT.—T. R. Jones has given a contract to E. McFarland for an incline. This is promising copper ground on which more extensive development will soon be started.

BINGHAM TUNNEL COMPANY.—A special stockholders' meeting is called for October 30th, at the company's office in the Auerbach Building, Salt Lake, to amend the incorporation articles so that the shares needed for raising funds to go on with the work may be properly issued. Secretary A. F. Lamson is in the East, and it is reported that he has met with success in securing capital to complete this important economic undertaking. It is given out that work will be started next month.

YORK.—Lessee J. R. Morris marketed 2 cars of 40% and 6 oz. silver ore last week. He states that other shipments will soon follow.

SUMMIT COUNTY.

(From Our Special Correspondent.)

ANCHOR.—In the issue of October 16th was noted the appearance of lead stringers in face of the 1,600 level. This was cut two days ago, showing a strong galena ore body, carrying less zinc than in the upper workings. On Friday last a Huntington crusher was received, making the latest addition to the mill. Annual meeting is to be held at company's office, in Park City, on November 17th, at 10 o'clock, a. m., and not as previously published.

CONSTELLATION.—Exploring the gold ore zone has continued with moderately favorable results, though it is not as yet a paying proposition. In all probability an assessment of 1½c. will be levied at the next directors' meeting to be held before the end of the month.

CREOLE MINING COMPANY.—Annual stockholders' meeting was held at company's office, Park City, October 18th, resulting in the election of the following directors and officers: J. J. Thomas, president; E. W. Berry, vice-president; Elizabeth Condon, treasurer; J. M. Lockhart, secretary; W. A. Fortesque, John A. Condon. Physical condition of mine is reported more promising than for a year past. There are 1,000 tons of ore blocked out, in well marked lime contact. Regular shipments are anticipated, beginning November 1st. Capitalization is \$1,500,000, shares \$10. Assessments cannot be levied save by vote of three-fourths of all the shares. Mr. Fortesque, the former president, declined to serve another term and he urged the election of Mr. Thomas in his stead.

CRESCENT.—On October 20th a shipment of three cars of good grade was sent forward over the Union Pacific. At the present time no ore is being mined and this consignment was a lot taken out early in the summer.

VALEO.—Sinking the winze from the upper tunnel is suspended, owing to foul air, to be resumed so soon as a fan and air pipe can be put in. It is down 150 ft. and the 2-ft. pay seam of good copper-gold ore continues to the bottom. The vein appears to have less dip at this depth and the lower tunnel will have to be driven fully 50 ft. farther to cut the ledge. Management is greatly encouraged with the outlook.

TOOELE COUNTY.

(From Our Special Correspondent.)

DE LA MAR'S MINES.—On Wednesday of last week the work of putting up the steel for the shaft, house and mill was begun in earnest. There are over 20 carloads of structural steel at Fairfield Station, 11 miles away, as many more are on the way, and this material will be delivered as rapidly as it can be handled. From present signs it appears probable that this huge structure will be finished before the end of the year, or within a few weeks of the date first specified.

MONO.—Mr. M. T. Gisborn makes known the cutting a seam of 8 to 12 in. thick, carrying 50% lead, 120 oz. silver, \$4 to \$14 gold per ton. The

Mono is an old mine which shows evidences of a new lease of life.

WESTERN MINING AND REDUCTION COMPANY.—Incorporation articles were filed with the Secretary of State, on October 21st. Capitalization, \$30,000; shares, 10c.; with 100,000 shares set apart for treasury needs. Head office, Salt Lake; annual meeting, the fourth Tuesday in October. Officers and directors are: E. W. Tatlock, president; Harry T. Duke, treasurer; A. E. Beveridge, secretary; John A. Shettle, manager; all of Salt Lake. Realty consists of Woman's Exponent and North Star lode claims in Dugway mining district.

WASHINGTON.

SNOHOMISH COUNTY.

A German syndicate is reported to have bought a group of 33 claims on Troublesome Creek, near Index. The Great Northern road is said to be interested in the deal.

WEST VIRGINIA.

MINERAL COUNTY.

MANOR BIG VEIN COAL COMPANY.—The mines of this company, at Shaw, have been closed.

PRESTON COUNTY.

Messrs. J. A. Hastings and J. I. R. Johnson, of Pittsburg, Pa., are understood to be negotiating for 10,000 acres of coal land in this county.

WYOMING.

SHERIDAN COUNTY.

WYOMING PIONEER BUILDING STONE AND MARBLE COMPANY.—This company will have its headquarters in the city of Sheridan. The objects of the company are to quarry building stone and marble, develop any and all mine or stone claims now owned by the corporation or acquired, to dispose of the products of such claims, to make application and appropriate waters of the State for the purpose of working stone, and to construct ditches, canals, etc. The capital stock is \$200,000 divided into 200 shares. The trustees for the first year are Christian Shelter, John Goodnight, Edmund G. Guyer, Charles S. Watson and A. W. Lindsay.

FOREIGN MINING NEWS.

AFRICA.

GOLD COAST.

WASSAU GOLD MINING COMPANY.—This company reports for the month of September 555 tons of ore crushed, with a recovery of 590 oz. gold; an average of 1.04 oz. per ton.

TRANSVAAL.

WITWATERSRAND OUTPUT.—The following table gives the output of the Witwatersrand gold fields for the first nine months of the year for three years, in crude ounces:

	1895.	1896.	1897.
January.....	177,463	148,178	209,832
February.....	169,295	167,018	211,000
March.....	184,945	173,952	232,066
April.....	186,323	176,707	235,698
May.....	194,580	195,208	248,395
June.....	206,911	195,640	251,529
July.....	199,453	203,873	242,479
August.....	203,373	213,418	259,603
September.....	194,764	202,561	262,450
Total.....	1,711,337	1,774,355	2,152,662

September was a record month, but its excess over August is small. Few companies show an increase. Two, which only began crushing in August—Balmoral and Crown Deep—are responsible for a much larger output; and the Robinson—the largest producer—reports 19,194 oz., an increase of over 1,200 oz. on its August figures. The figures of the other mines do not vary greatly from those of the previous month, though in several cases they are a little smaller. Comparatively large decreases occur in the case of Geldenhuis Deep and Jubilee, that in the last named being attributed to scarcity of water.

AUSTRALASIA.

NEW SOUTH WALES.

BROKEN HILL PROPRIETARY COMPANY.—For the four weeks ending October 14th this company reports 15,456 tons of ore treated, a quantity considerably below the average. The refinery report shows a production of 291 oz. gold, 392,284 oz. silver, 1,256 tons lead and 25 tons hard or antimonial lead. In addition there was produced copper matte estimated to contain 4,858 oz. silver and 12 tons of copper.

QUEENSLAND.

MOUNT MORGAN GOLD MINING COMPANY.—This company's report for the month of September shows that there were 11,838 tons of ore treated during this period. The gold recovered was 13,586 oz., showing an average yield of 1.15 oz. per ton of ore.

TASMANIA.

MOUNT LYELL MINING COMPANY.—This company reports for the four weeks ending September 22d that there were 8,927 tons of ore worked. The product was 436 tons of matte, the contents being 1,872 oz. gold, 63,589 oz. silver and 431 tons of copper; the average return from the ore was therefore 4.83% copper, 7.12 oz. silver and 0.21 oz. gold per ton worked.

CANADA.

BRITISH COLUMBIA—SLOCAN DISTRICT.

(From an Occasional Correspondent.)

The following is the output of the mines around Sandon, from August 1st to October 7th: Slocan Star, 1,380 tons ore; Ruth, 2,010; Payne, 2,917; Noble Five, 497; Reco, 240; American Boy, 29; Slocan Boy, 45; Wonderful, 14; Ajax, 15; Majestic, 12; Freddie Lee, 16; Mt. Adams, 15; miscellaneous, 8; total, 7,614 tons.

ADAMS GROUP.—The lowest tunnel is now in 220 ft., showing a ledge of good concentrating galena of 4 to 5 ft. wide.

LAST CHANCE.—This company is preparing for a heavy output this winter. It has a large amount ore in sight.

MT. ADAMS GROUP.—The tunnel, which is in 240 ft., for the last 50 ft. has shown from 2 to 3 ft. of clean galena ore.

PAYNE MINE.—The new tramway from the mine to the Kaslo & Slocan Railway is nearly completed. It is 5,900 ft. long with an average grade of 50%. The cars weigh 1,500 lbs. and carry 4 tons of ore. It is of the three-rail system with a ¾-in. cable. Extensive warehouses and offices are going up. Sixty tons a day are shipped regularly. This mine has proved so far to be the richest of the Slocan.

RUTH MINE.—About 45 tons a day are shipped of both carbonates and galena.

SLOCAN STAR.—In the fifth tunnel, after cross cutting 1,000 ft a quartz ledge was struck carrying an ore body 5 ft. wide, of good concentrating galena ore. The find is at a depth of 730 ft., the lowest depth reached as yet in Kootenay, and 130 ft. lower than the Le Roi mine of Rossland.

BRITISH COLUMBIA.—TRAIL CREEK DISTRICT.

(From Our Special Correspondent.)

TRAIL CREEK ORE SHIPMENTS.—The shipment of ore to October 20 in this camp reached 65,000 tons, of which about 2,700 tons were milled in the camp.

BRITISH COLUMBIA BULLION EXTRACTING COMPANY.—This company has commenced the erection of a boarding house 58x20 ft. for the accommodation of their men on the site of the proposed reduction works for low grade ores near O. K. Mountain. The site for the works has been selected and some progress will be made in this direction this fall, should the season prove favorable. Several men are now engaged in preliminary work and it is stated that about 40 men will shortly be employed in building and other operations connected with the works.

CENTER STAR.—This company will soon be stopping ore. The upraise is about completed, and just as soon as the policy of the company is settled, which will be at a meeting to be held soon at Butte, the plans of the management will be carried out. The shipments of ore so far have reached 854 tons.

DIVIDENDS IN THE KOOTENAY DISTRICT.—The following named mining companies in operation in West Kootenay district have declared dividends amounting to the respective sums given up to October 1st, 1897: Le Roi, Rossland, \$575,000, paid on \$500,000 stock; War Eagle, Rossland, \$187,000 on \$500,000 stock; Idaho, Slocan, \$152,000 on \$500,000 stock; Last Chance, Slocan, \$40,000 on \$500,000 stock; Rambler-Cariboo, Slocan, \$40,000 on \$1,000,000 stock; Reco, Slocan, \$187,500 on \$1,000,000 stock; Slocan Star, Slocan, \$350,000 on \$1,000,000 stock; Cariboo, Boundary, \$156,965 on \$50,000 stock. The total amount is \$1,688,465 paid on \$5,800,000 stock. This amount does not represent the total of dividends paid as several companies in the Slocan and adjoining division do not make any returns of their earnings. A moderate estimate places the entire dividends at \$2,000,000, with a nominal capital of about \$8,000,000. Of the above \$918,965 are dividends from gold mining companies and \$769,500 represent silver-lead companies.

GOLD HILL MINING COMPANY.—Recently Mr. Justice Drake, of British Columbia, gave a decision in the case of R. T. Daniels vs. the Gold Hill Mining Company. This action was brought to set aside a conveyance by the directors of the company which was made to E. J. Doreen, a brother of one of the directors, on the grounds that the conveyance was fraudulent, being without adequate consideration and with intent to defraud the creditors and shareholders of the company. The property transferred was the Gold Hill Mineral claim, near Rossland, and the transfer was made under the laws of Washington. The company was duly registered under the laws of British Columbia, which provide that the property of a foreign corporation, which property is within British Columbia, can only be sold or transferred by resolution passed at a general special meeting of the stockholders, representing at least two-thirds in value of the paid-up capital stock of the corporation, which meeting must be held within the province. The property was sold for \$1,250 at a meeting of the directors held in the State of Washington, while it was clearly shown before the British Columbia court that the actual market value of the property was about \$5,000. According to Justice Drake the price paid was held to be inadequate. So apparent was this that it clearly showed collusion between the directors and Doreen. As the provisions of the British Columbia statutes had not been followed, the conveyance was set aside. Judgment was given the plaintiff for costs and it was ordered that the conveyance be surrendered for cancellation. Notice of appeal was given by the defendants.

LE ROI.—This company has so far this year shipped about 46,000 tons of ore. It has recently declared a dividend of \$50,000.

NEW GOLD FIELDS OF BRITISH COLUMBIA.—This company, through Sir Charles Tupper, has purchased from Jeff Lewis and associates the Portland mineral claim on Sophie mountain adjoining the Velvet group purchased by the same syndicate about a month ago. The consideration is stated to be \$9,000 cash and 10% of the stock. The lode is said to be the same as that on the Velvet.

O. K.—A meeting of the creditors and shareholders of this company was recently held in Victoria before the Registrar, Mr. B. H. T. Duke, to ascertain the wishes of both parties with regard to the appointment of a liquidator. A statement of the facts connected with the history of the mine was made at the meeting, beginning with the installation of the 10-stamp mill and the necessary machinery. The management was placed in the hands of Mr. Warner, a large shareholder and a director. The company, in order to carry on business, borrowed \$30,000 from the Old National Bank of Spokane under a certain agreement as to repayment. The bank desiring to cancel the agreement demanded notes from the company. The old board of directors disagreed to this and resigned. The new board which was formed gave these notes, and very shortly after the bank demanded payment of the notes, and the manager was compelled to make a declaration that he had no funds either to pay the notes or carry on business, and, therefore, that the company was insolvent. At the meeting the shareholders were represented by 600,000 shares and the creditors by 580,000, but they could not agree on the selection of a liquidator and the matter was left to the court. A proposal to purchase the property was submitted, the amount being \$150,000. Another offer was made to put in \$25,000 in machinery and take stock in return. These were not considered then. The total indebtedness of the company is \$43,177. Of this sum \$30,190 is claimed by the Old National Bank of Spokane, \$10,000 by Mr. Warner and the old directors, and about \$400 by the Nelson & Port Shepherd Railway Company. In all probability the affairs will be wound up by the court and the property will pass into the hands of a new company.

PORTO RICO.—On this group, situated about 20 miles south of Nelson, three tunnels are being driven on the course of the ledge which varies greatly in character and value.

RED MOUNTAIN.—This company has about 43 acres on the southeast face of Red Mountain. There are three lodes, two of which run the entire length of the claim; the third, known as the Pilgrim lode, is on this property for the distance of 400 ft. All of these lodes are highly mineralized, and very high assays have been taken out, some of them running high in gold and copper. The main tunnel is in Red Mountain about 600 ft. and there are two shafts besides some crosscutting. The company installed a three-drill compressor about a year ago, and it has been constantly at work. The showing is regarded as unusually good. The company is capitalized at \$1,000,000. The treasury stock is \$50,000. John Couch Plunders, of Portland, Ore., is president; Charles Sweeney, Spokane, Wash., vice-president; D. W. Peflier, Spokane, superintendent. The company will continue development work throughout the coming winter.

NOVA SCOTIA.

SPRINGHILL MINES.—A few days ago fire broke out afresh in the east slope near the 800-ft. level. The new bank-head at the west slope is being rushed ahead and good progress made in pumping the water from the slope. The 10-hour shift proved to be a failure for the company, for after several days' trial the output was actually lower by 100 boxes than on the ordinary shift.

ONTARIO—LAKE OF THE WOODS DISTRICT.

(From Our Special Correspondent.)

BURLEY GOLD MINING COMPANY.—A cofferdam 60 ft. square is being constructed on Queen Bee Island, near the company's water location, and will shortly be floated to the point in Bald Indian Bay, at which it is proposed to sink the shaft. The dam is being constructed of 8-in. square timbers, and has a watertight compartment 10 ft. wide running round the center, leaving an area of 40 sq. ft. in which to work when the dam is in place. The water at the proposed point of operations is about 20 ft. deep, and the dam will be about 25 ft. high, according to future developments. Heavy centrifugal sinking pumps, with a capacity of 1,600 gals. a minute, will be used in emptying the dam. A steel caisson will be lowered into the shaft and the long bore system used in sinking, being the same system as used at Hell Gate Reef, New York some years ago.

CAMERON ISLAND.—A contract has been let for the development of the quartz vein on this property, which is situated in Shoal Lake, and was recently sold for \$15,000.

MCA. 129.—This property, situated near Gi-hi Lake, about 22 miles from Rat Portage, was recently bonded by John McAree & Company, of Rat Portage, to Captain Triggs, of Duluth, who represents American capital, the price being \$20,000 on a short date. A pit of 12 ft. has been sunk on the main vein, which is about 4 ft. wide and assays \$30 across the vein. The ore is free milling. A gang of men left with Captain Triggs this week to commence operations immediately on the property, and every-

thing will be placed in working order for the winter.

REGINA MINE.—The shaft is now down about 325 ft., and the vein is from 5 to 6 ft. wide, of an average value of \$13 or \$14. There are five levels running about every 60 ft., amounting in all to about 1,300 ft. The present mill on the property is not giving satisfaction.

YUM YUM.—In crosscutting a known vein on this property with the diamond drill, another vein was cut which did not show in any way on the surface. The vein contains a body of good ore.

ONTARIO—RAINY LAKE DISTRICT.

SAW BILL MINE.—The first clean-up of this property yielded, according to reports, 180 oz., worth about \$3,800, from 250 tons of ore.

ONTARIO—RAT PORTAGE DISTRICT.

(From Our Special Correspondent.)

MIKADO MINE.—On October 15th the results of 20 days' run with the 20-stamp mill were brought to Rat Portage and were approximately worth \$12,000. Another shaft is being sunk on a parallel vein. This vein is about 200 ft. from the main one, and the shaft will follow the vein on an incline; there is every appearance of the second vein proving as rich as the first. Air drills will shortly be installed to push work during the winter months.

OLIVE MINE.—A recent run of 11 days with the two-stamp mill resulted in \$3,500. This is the second brick from this property.

ONTARIO, LIMITED.—Twenty-five tons of ore from this property were recently milled at the Mikado mill. The return per ton in free gold being \$7, and the concentrates, which are very heavy, carry about \$10 to the ton. Development work has shown several veins to be of good value and width.

COLOMBIA.

ZARAGOSSA.

SAN ANTONIO MINING AND TRADING COMPANY.—This company was incorporated at Albany, N. Y., on October 21st, with a capital stock of \$5,000, and the following directors: Frank M. Colwell, Bowers H. Leonard, Alfred F. H. dgman, George B. Sweeting and Benjamin M. Wilcox, of Auburn, N. Y.

MEXICO.

DURANGO.

ANITA MINING COMPANY.—This company was organized in New York; Joseph McDonough is president, D. H. Norris, vice-president, R. H. Husted, manager, and John R. Harbottle, superintendent. A 10-stamp mill is working at the mines. Operations were started on May 27th, but these were stopped owing to a lack of water. Regular work, however, was begun on July 1st, and since then \$10,000 worth of high-grade ores and concentrates have been shipped. On July 17th \$5,000 worth of ore was transported, showing 5 oz. gold and 220 oz. of silver, and on August 3d another shipment was made of concentrates from purchased ores, showing 3 oz. of gold and 160 oz. of silver. About the same time, concentrates from the principal mine, it is said, showed 6½ oz. of gold and 141 oz. of silver.

MICHOACAN.

Reports state that there is a great deal of prospecting going on in this State as attempts are being made by several syndicates to secure control of the immense copper deposits found there. The recent sale of the Inguaran property for \$6,000,000, to a French syndicate, has caused a great boom in copper mining. Several other smaller properties have also been sold to American and English capitalists.

MORELOS.

SANTA ANA.—This mine, in the Huautla district, has a monthly extraction amounting to \$30,000, the ore averaging 53 oz. to the ton. In addition, about 12 tons of picked ore are shipped monthly.

PUEBLA.

The large deposits of copper ores recently discovered in this State have just been secured by Isham Brothers, who will develop the same.

PARIAM GOLD MINES.—The new mill in connection with these gold mines, is fast nearing completion. Gold is being extracted in considerable quantities.

SAN LUIS POTOSI.

RECOMPENSA MINE.—This silver property has been sold to Pittsburg, Pa., parties. The price is said to have been \$75,000.

SONORA.

LA MINA BLANCA.—It is said that a syndicate organized by F. E. Dickinson has purchased this property, and that a 40-ton concentrator will be erected and everything put in first-class order. P. Wilson, who secured the property for the syndicate, will be in charge of the operations.

LAS ANIMAS.—The new owners of this mine have begun developing the property and have already made a rich strike of gold ore. Machinery for the proper working of the mine will be put in very soon.

MULATOS MINE.—This property has been sold to an English syndicate, who will put in new reduction works. The reported price is \$1,000,000.

SOUTH AMERICA.

ECUADOR.

It is announced by the Consul-General in New York City that bids will be received for leasing mines of petroleum, asphalt and other bituminous substances, located in the parish of Santa Elena, Province of Guayes.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, October 29.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending October 22d, 1897, compared with the corresponding period last year:

	1897.		1896.
	Week.	Year.	Year.
Pennsylvania Railroad.....	98,887	2,887,705	2,923,105

PRODUCTION OF BITUMINOUS COAL in tons of 2,000 lbs. for week ending October 22d, and for years from January 1st, 1897 and 1896.

	1897.		1896.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	51,216	1,966,692	2,292,750
Barclay, Pa.....	1,257	33,352	35,547
Beech Creek, Pa.....	64,414	3,014,580	2,384,963
Broad Top, Pa.....	*	2,959,406	305,615
Clearfield, Pa.....	73,457	2,081,282	3,641,423
Cumberland, Md.....	61,336	3,141,142	2,855,409
Kanawha, W. Va.....	191,758	3,096,296	2,895,210
Phila. & Erie.....	1,123	189,664	63,108
Pocahontas Flat Top.....	*	*	*
Totals.....	347,461	16,476,157	14,453,69

	1897.		1896.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	30,449	919,267	1,029,559
Pittsburg, Pa.....	37,476	1,559,661	1,534,020
Westmoreland, Pa.....	42,822	1,767,164	1,525,303
Totals.....	110,647	4,246,094	4,088,882

Grand totals..... 458,108 20,722,251 18,542,581

Production of coke on line of Pennsylvania Railroad for the week ending October 22d, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 115,162 tons; year, 3,748,454; year to corresponding date in 1896, 3,211,059 tons.

* For week ending October 14th. * Returns not received.

Anthracite.

The hard coal trade is in a congested condition, and prices continue weak. It appears now as though the consumers were purchasing only in a hand-to-mouth way in anticipation of a further reduction in prices, while dealers are also disinclined to buy heavily for the same reason. It is a little encouraging, however, to note that there is more inquiry in the West, where egg coal is being most sought for. In all the coal-consuming centers we understand prices are being shaded more or less, and this is especially so at tidewater, where free burning chestnut coal has been offered at \$3.35; stove at \$3.85@4; egg from \$3.80 up, and broken at \$3.50@3.60 per ton, all on board, New York. All these prices are lower than any "official circular" this year.

The demand for broken has declined to such an extent as to make it more profitable for some of the producing companies to reduce that coal to smaller sizes which are easily marketable. We learn from an authoritative source that the output in September was in round numbers 4,087,000 tons, and not 4,350,000 tons as was stated. Considerable of this coal is being shipped to the Western cities, and it is this source of outlet which has helped several of the companies to dispose of their surplus stocks. For the next four or five weeks shipments to those points will relieve the tidewater market materially, but if the operators continue to be extravagant in mining coal in the meantime, the market will be critically affected when lake navigation closes. Then we will probably see a period of low prices and keen competition for business among the sales-agents. During the early months of the year the operators adhered pretty well to their allotments, but as the year closes they are again following their old tactics of over-production. The result of this imprudence on their part is too well known from the records made in previous years to be repeated here. Unfortunately, sales-agents are growing uneasy with the present condition of affairs, and some of them venture to predict a break up in the market before the opening of 1898. There appears little doubt in the minds of many that the output in October will be close on 5,000,000 tons. What the consumption will be remains to be seen; so far it has been comparatively less than last year at this time owing to the prevailing climatic conditions.

There is still a shortage in the supply of cars, and Western shippers continue to complain more or less of this inactivity on the part of the railroads. The vessel market is dull, and boats on their way to the far East are wind-bound, which has caused some anxiety among those who supply that market with coal.

In conclusion we might say that the outlook of the anthracite coal trade momentarily is doubtful, and is full of "ifs" as one sales-agent put it. To improve the prospects strenuous efforts must be made by the producing companies to curtail their output and hold up their end as regards prices.

Bituminous.

The soft coal trade is dull generally, but fair tonages seem to be going forward on old contracts. The complaint with many shippers this week is the lack of vessels, owing to the flow of the tide and the high winds. The scarcity of vessels and bad weather have affected shipping to a greater extent than was at first thought, inasmuch as many of the

boats had to put into the harbors for rather a long period. This has naturally delayed arrivals at the various shipping ports, and has created some distress.

Trade in the far East is hard to get, outside of what the producers already have on old contracts. Sound business is taking a fair amount of coal and has secured more than its share of vessels on account of their preference for Sound ports to those beyond the Cape. New York Harbor trade is regular, though it is not active. All-rail business is taking a little less coal than last week.

Transportation from mines to tide is up to all requirements, producers rather desiring a delay in receiving the coal at the shipping ports rather than have it put through quickly on account of the scarcity of vessel tonnage. The car supply is fairly good, but in some cases we hear of a shortage. In the coastwise market vessels are very scarce, and in urgent demand; in consequence freight rates are advancing. We quote current rates of freight from Philadelphia as follows: To Boston, Salem and Portland, 70c.; Providence, New Bedford and the Sound, 60c.; Wareham and Portsmouth, 75c.; Lynn, 80c.; Newburyport, 80c.; Dover, 90c. @ \$1 and to wages; Bangor, 90c. @ \$1; Saco, 90c. and to wages; Bangor, 75c.; Bath, 75c. @ 80c. alongside; Gardiner, 80c. and to wages. Five and 10c. above these rates are asked to the lower ports.

NOTES OF THE WEEK.

The Tennessee Coal, Iron and Railroad Company, the Louisville & Nashville Railroad, and the Inter-Oceanic Steamship Company have secured a contract to supply the railroads starting from Vera Cruz, Mexico, with about 100,000 tons of Alabama coal in 1898. Formerly English coal was used by these consumers.

Birmingham, Ala.

Oct. 27.

(From Our Special Correspondent.)

The interference with the coal trade of Birmingham by the yellow fever scare is much more marked than with the pig iron because a very large proportion of the coal mined in this district is consumed in the country and by the railroads south of us. One company's output alone has suffered to the extent of about 1,000 tons per day during the last week or two. Of course the miners have been heavy losers through loss of time because the present demand is not equal to the capacity of the mines. Prices quoted are: Good steam coal, 90c. per ton at mines in carload lots; good domestic lump coal, average, \$1.60 per ton at the mines in carload lots.

The coal mined from Cahaba field at the collieries at Montevallo, Aldrich, Hargrove and Blocton is in the most demand for domestic purposes. For steam and coking the Pratt seam in the Warrior field furnishes a very large proportion of the supply necessary to meet the demand.

Buffalo.

Oct. 28.

(From Our Special Correspondent.)

The anthracite coal trade is quite brisk because of the requirements of housekeepers. Prices are unchanged. Dealers say that the schedule is well maintained. The demand for near-by towns and Canada is light. Traveling agents report that they have difficulty in securing orders, as the would-be purchasers claim that quotations are too high. The shipments of anthracite coal by lake last week were the largest for the season; they continue heavy and are likely to exceed the aggregate of last week. The dense fogs which have prevailed for several days have made navigation quite dangerous, causing many vessels to go ashore.

The bituminous coal trade is good, and prices apparently are well maintained. Manufacturers are busy. Vessel men are using large quantities, as the clearances from Buffalo are numerous. Stocks are not large, but there is no difficulty in filling orders.

The demand for coke is good and prices are well maintained. The reports from the coke regions indicate great activity.

The shipments of coal from Buffalo by lake westward from October 17th to 23d, both days inclusive, aggregated 114,463 net tons, distributed as follows: 52,950 tons to Chicago, 26,850 tons to Milwaukee, 10,500 tons to Duluth, 4,025 tons to Toledo, 2,400 tons to Gladstone, 600 tons to Detroit, 2,800 tons to Manitowoc, 11,800 tons to Superior, 628 tons to Amherstberg and 1,850 tons to Bay City. The rates of freight were 40c. to Chicago, Green Bay, Milwaukee and Manitowoc; 50c. to Portage; 30c. to Detroit, Bay City and Amherstberg, and 25c. to Duluth, Toledo, Gladstone and Superior. A little soft coal was taken to Duluth at 30c. Closing with good demand for room.

The will of Mr. George H. Lewis, who died a few days since, has been found at last, and it is believed that \$2,000,000 will be the value of his estate. He was a member of the well-known coal firm, the Bell, Lewis & Yates Company, of Buffalo.

The American Sault Ste. Marie Canal will be closed November 15th to allow the construction of new gates, but the Canadian canal will remain open until the close of navigation, so no hardships will result to vesselmen.

The plant, stock and good will of the new Buffalo Queen City Gas Company, heretofore owned by Mr. J. Edward Addicks and others, will be formally transferred to Buffalo capitalists in a few days. The consideration is said to be about \$1,000,000. The leading capitalist says that the contract has been made, and the new concern will make gas on

a purely business basis, and will erect a plant under the advice of skilled and expert men.

Pittsburg.

Oct. 28

(From Our Special Correspondent.)

Coal.—The situation is as unsettled as ever; the differential question is causing lots of trouble, and daily meetings are held. H. C. Boughman said he thought that the present differential between the mining prices in the different pools was entirely wrong and uncalled for, besides being unreasonable. His argument was that the freeing of the river relieved the Fourth Pool operators of a burden which caused the differential to be established. There is no allowance made for the difference in towing from any of the pools to the Pittsburg harbor made by the firms from whom the witness buys the coal, or to whom he sells it. There is no market for any coal but Fourth Pool product at Cincinnati, and similar conditions are arising in all other markets.

At Louisville the Pacific Coal Company, of Pittsburg, has bought out the Winifrede Coal Company, of Louisville, and will control the retail trade of that company.

Activity in the railroad district continues unabated. All mines are ruing full time. Pittsburg's lake coal tonnage this year will not fall behind last year's tonnage; it may even exceed it. The arbitration is expected to last for some days.

As a result of the trial in Pittsburg, October 27th, of Capt. S. S. Brown, the coal operator, on a charge of violating the anti screening law, the Superior Court will have an early opportunity to pass upon the constitutionality of the act of assembly passed July 15th, 1897, providing for the weighing of all coal before screening it. The suit against Captain Brown was brought by John Haddon, an employee of the firm at its Boston mines, and is intended to be a test of the new law. The commonwealth called Haddon as its only witness. He swore that on September 27th coal that he dug at the Boston mines was screened before being weighed. The defense had no witness, but Attorney W. B. Rodgers asked Judge R. S. Frazer to instruct the jury that the indictment under which it is drawn is unconstitutional, and therefore there could be no conviction. Mr. Rodgers contended that the act came under class legislation, for the reason that it made a sub-class of bituminous operators and was unconstitutional because it was not in keeping with its title. Attorney Brennan opposed Mr. Rodgers' request. Judge Frazer announced that he had come to the conclusion that the case was a very important one and involved a question which should be decided by the higher courts. He therefore suggested that a special verdict as to facts be drawn and returned by the jury, and then the matter should be argued before a full bench in time to get before the Superior Court at its next meeting in Philadelphia in November. This was agreed to by both sides, and a special verdict was rendered according to the facts as testified to by Haddon.

Connellsville Coke.—The trade last week showed a falling off compared with the preceding one. The Frick Company fired 100 ovens and the Hostetter Company 28 ovens. The W. J. Rainey Company has commenced the erection of 200 new ovens. The report of the operation and output of the Connellsville region shows 14,627 ovens active and 3,736 idle. The production for the week amounted to 144,911 tons, being an increase of 2,847 tons. In time 6,956 ovens made six days; 6,533 ovens made five days; 487 ovens four days; 390 ovens three days, and 50 ovens, the Semet-Solvay by-product plant, seven days; an average of 5.40 days as against 5.23 days the week previous. The shortage of cars has become a hindrance to the shipment of coke. The shipments last week aggregated 7,935 cars, a decrease of 475 cars compared with the preceding week. Hundreds of coke workers who left here last year are returning and getting employment at the coke works throughout the region.

Prices are firm and it is stated that the lowest figure for coke is \$1.75. Report says that a small firm has sold the entire output for the coming year at \$1.65. The shipments were as follows: To Pittsburg, 2,850 cars; shipped west, 3,785 cars; sent east, 1,250 cars; total, 7,885 cars.

Shanghai, China.

Sept. 24.

(Special Report of Wheelock & Co.)

Coal.—Owing to the drop in the value of the yen, the market for Japan coal has declined with great rapidity, and sales of good qualities were made at much lower prices, with further supplies obtainable at still cheaper rates. The result is that the business during the past two weeks has been limited to actual requirements for consumers, the only sale of importance being a small cargo of Otziyi at 6'60 taels per ton, ex-godown. Cardiff coal is not in demand. The *Gulhrrie* arrived on September 21st, with 1,200 tons of Wollongong coal, sold to arrive at 9 taels, and as first hands declined to meet the views of the natives, no further business has been done, but we venture to say that at the present ruling rate of exchange the article can be laid down at prices which the Chinese are prepared to pay, and whether it is good policy to refrain from doing anything remains to be seen. It becomes more and more certain every day that unless importers see their way to be a little more reasonable, Kaiping coal will undoubtedly take the place of this article and Wollongong will be a thing of the past. The arrivals of all kinds of coal during the fortnight aggregated 25,331 tons. We quote for American anthracite, 12 taels per ton; for Cardiff, 16 taels; for Sydney-Wollongong, 10.50 taels, and for other Australian coal, 6'60 @ 7 taels per ton.

Kerosene Oil.—The native settlement on September 11th has apparently passed off satisfactorily, but business in American oil has since been slack and is confined chiefly to small spot sales from 1.75 @ 1.60 taels, the closing quotation being 1.70 taels, one month prompt. We hear of a fair quantity of steamer September-November sailing having been settled at 1.75 1/2 taels, but forward sales are entirely governed by exchange, which is in such an up-and-down condition that buyers are shy and prefer to wait. Stocks in godowns and in course of discharge amount to about 830,000 cases. There was an arrival of 73,000 cases of American oil on September 12th. Batum oil has received most attention during the past fortnight, and a good spot business has been done at prices ranging from 1.65 @ 1.62 1/2 taels, closing strong at the latter rate. Stocks of all kinds amount to 525,000 cases. We have heard of no transactions in Langkat oil, of which stocks amount to 108,500 cases. An arrival of 100,000 cases of this oil was noted on September 24th. Quotations are as follows: American Devole's, 1.70 taels per case; Russian Batum, Anchor Chop, 1.62 1/2 taels; Horse Chop, 1.60 taels, and bulk oil, 1.47 1/2 taels per two tins; Langkat, 1.55 taels per case.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Oct. 29, 1897.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Oct. 30, 1896.	Oct. 29, 1897.	Jan., '96.	Jan., '97.	Tons.	Tons.
Anthracite.	26	15,150	21	14,850	1,027,310	646,482
Coke.....	81	84,650	127	183,050	6,298,104	5,967,557
Charcoal...	24	6,750	20	4,750	252,063	183,007
Totals...	131	116,550	171	202,650	7,577,479	6,792,026

The trade is settling more and more into the condition of a waiting market, and no one has any very definite idea how long that state of affairs will last. On the one hand buyers are not quite certain about the condition of trade in the later winter months; two or three months of active work is secure, but beyond that no one feels quite safe. Many hold also that the increased output of raw material is going to keep down prices, and that they are quite safe in waiting. On the other hand, furnacemen are in doubt about the prices they may have to pay for ore and coke next year, and most of them believe that those prices will be higher. Coke has already gone up and ore may follow. At any rate they do not feel disposed to make long contracts and are quite sure they will lose nothing by waiting. For the present the advantage is rather with the furnacemen, as any improvement will strengthen their position, and if trade should decline they will be in no worse condition than at present.

There is a very good demand for structural iron and steel; and more new building operations are in hand than for a long time past. Railroad demand is also promising well, and good orders for ship-building material are under negotiation.

The talk of a new wire and wire-rod combination is still heard, but the reports still lack confirmation. Parties usually well informed take little stock in the rumors at present.

Export trade is quiet under the combined effect of more active demand at home and high ocean rates. Japan is quite an active customer just now, and several contracts for that country are reported.

NOTES OF THE WEEK.

The Pittsburg, Bessemer & Lake Erie, the new Carnegie ore road from Conneaut on Lake Erie to Homestead, is open and ore trains began to run over it this week, though the terminal connections in Pittsburg are not quite completed. The rail rate on ore from Lake Erie to Pittsburg has been fixed at 98c. per ton.

The production of steel in Great Britain for the half-year ending with June is reported by the Iron Trade Association as follows in long tons:

	1896.		1897.	
	Tons.	Per cent.	Tons.	Per cent.
Bessemer.....	905,522	46.0	997,159	47.4
Open-hearth.....	1,063,789	51.0	1,353,768	57.6
Total.....	1,969,311	100.0	2,350,927	100.0

This shows an increase of 91,637 tons, or 10.2%, in Bessemer steel; of 289,979 tons, or 27.3%, in open-hearth; and of 381,616 tons, or 19.4%, in the total output.

New York.

Oct. 29.

The market during the week past was generally quiet and unchanged. The upward movement has given place to a period of suspense. Prices in general are firm, with good business in certain lines. There is little of note in the export business. Several locomotives are going forward for the Japan railroads.

Local representatives profess to know nothing about the proposed wire pool, of which there has been some talk.

Pig Iron.—The market during the latter half of the week was dull and slow, with prices decidedly weaker. This weakness was chiefly in warrant

iron, as certain parties, being obliged to liquidate, sold for 50c. below furnace schedule.

The furnaces still hold off and the outlook is good. This upward tone is strengthened by the drought in the Connellsville coke district.

Prices quoted 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, \$10.50; Southern No 1 Foundry, \$11@11.25 per ton; No. 2 Foundry, \$10.75@11; No. 1 soft, \$11@11.25; No. 2 soft, \$10.75@11; gray forge, \$10@10.25; Basic, \$10.50@10.75.

Cast-Iron Pipe.—There is little to note except that prices remain firm and business quiet.

Spiegeleisen and Ferro-Manganese.—Prices are practically unchanged from last week as follows: Spiegeleisen, 20%, \$19@19.50; ferro-manganese, 80% domestic, \$45.50@46, delivered at buyer's mill.

Steel Billets and Rods.—Prices are generally stiffer all along the line, and mills are advancing them whenever possible. Quotations, however, remain about as last week: \$17.50@18 for billets at tidewater and \$22@22.50 for rods at mill.

Tool Steel.—The market is quiet with but little change, though prices are generally firmer.

Merchant Bar.—The market is hard and steady. Refined bar iron is quoted 1.25@1.30c. at New York.

Plates.—The advance in prices noted last week holds good, with the market firm. Prices are: Steel plates, 1.25@1.30c. for 1/4 in. and heavier, and 1.35@1.40c. for 3/8 in. Boiler plates are, for shell, 1.25@1.30c.; for flange, 1.40@1.50c.; for firebox, 1.60@1.70c.; universal mill plates are 1.15@1.20c. 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.—The market is firm; builders hesitate before placing contracts. Prices quoted are: Angles, 1.15@1.20c.; tees, 1.35c.; channels, 1.25c. Beams, in ordinary sizes, are 1.25c., New York delivery, and in carload lots, 1.35c. for 20-in. and 1.35c. for 24-in.

Steel Rails and Rail Fastenings.—The market remains good, with prices firm. Quotations for steel rails are \$20 per ton for standard sections, and \$23 for girder rails. Lighter rails are as follows: 16-lb., 20-lb., 25-lb., 30-lb. and 35-lb., \$22; 40-lb. and 45-lb., \$20 f. o. b. mill.

In rail fastenings there is little weakening from last week's advance. Tidewater quotations are: Angle bars, 1.10@1.15c.; spikes, 1.55@1.60c.; bolts, square nuts, 1.75@1.80c.; hexagon nuts, 1.95@2c.

Wrought Iron Pipe.—The market has been pretty steady during the week, with little change in prices or amount of business. Discounts are: 72% on 1/4 in. or smaller, and 78% on 1/2 in. or larger for wrought iron pipes. For galvanized discounts are 67% on 1/4 in. or smaller, and 70% on 1/2 in. or larger. These discounts are also shaded 10% for carload lots.

Nails.—The market continues good, and prices are firm. Wire nails in carload lots are \$1.65 at New York; cut nails, \$1.33.

Old Material.—The demand is very good and prices are, if anything, firmer. Quotations are: Iron T-rails \$11@12.50 per ton; scrap steel rails, \$9@10, and relays, \$13.50@15; hammered car axles, \$15@16; No. 1 wrought scrap iron, from yard, \$10@11, and from railroad \$11.50@12.50 per ton, all f. o. b. cars; car wheels, \$9@10 per ton, delivered at buyers' works; machinery cast scrap, \$9@10 per ton; wrought pipes and tubes, \$7.50@8, delivered, New York; wrought turnings, \$8@8.50 per ton; cast borings, \$6.50@7; burnt iron, \$5.50@6.50, delivered at mill.

Birmingham, Ala. Oct. 27.
(From Our Special Correspondent.)

During the past week the iron market in this district has been quite inactive so far as concerns sales consummated by the makers, but a great deal of iron has been moved from the warrant yards and considerable of the pig purchased by speculators some time back has been resold. The prices have ranged as follows: No. 1 foundry, \$7.75; No. 2 foundry, \$7.50; No. 3 foundry, \$7.25; No. 4 foundry and gray forge, \$7; No. 1 soft, \$7.75; No. 2 soft, \$7.50.

The yellow fever scare is paralyzing the business of the district except so far as shipments to the north and east are concerned. It is difficult for a non-resident to realize the fact that Birmingham, which is located a short distance north of the center of Alabama, is now practically the southern terminal point of all railroads which pass through it, so far as passenger travel is concerned; and that where freight has been started from this district southward it has been delayed, and in some instances has neither been delivered nor the cars returned. The railroad companies do not desire to start loaded cars into a section of country from which it is so difficult to get the empties returned.

Buffalo. Oct. 27.
(Special Report of Rogers, Brown & Co.)

As was expected, the unusual buying movement and general advance in prices is now followed by a lull. This has been caused not only by the activity and price advance, but also by the fact that most of the larger gray iron foundries have placed their contracts for their requirements for the balance of this year, and furnaces are reluctant to contract for any considerable part of their output for next

year, because it would not seem the part of wisdom for them to do this when they cannot hope for as cheap raw material next year as they have enjoyed during the year now drawing to a close; and in view of the now quite general activity among foundries in general, they do not care to contract into next year at prices based on this year's cost of production. As matters are to-day the furnaces are more interested in getting forward shipments and keeping their customers supplied than in selling. Prices are firm on the basis mentioned below, cash f. o. b. cars 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.

Cleveland, O. Oct. 27.
(From Our Special Correspondent.)

Iron Ore.—The volume of trade during the past week has not been an improvement over that of the former week. Both Bessemers and non-Bessemers figured in the transactions. A strong effort is being made to get down from the upper lakes all the ores sold. Stock piles at the head of navigation are reported to be cleared up to a large extent. The same carrying rates are being paid as have prevailed for some weeks past. The sales of ore were made upon the basis fixed at the beginning of the season, which follow: Specular and magnetic ores, Bessemer quality, \$3@3.75; specular and magnetic ores, non-Bessemer quality, \$2.50@2.75; hematite ores, Bessemer quality, \$2.50@3; hematite ores, non-Bessemer quality, \$2@2.50.

Pig Iron.—Some moderate lots of pig iron have been sold during the past week, but the activity has not been marked. However, the values continue firm. Following are the quotations: 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. 29.
(From Our Special Correspondent.)

Pig Iron.—Bessemer, basic and low phosphorus irons have met with fair sale this week in lots from 5,000 tons down. Forge and foundry irons are slow of movement just now and salesmen do not find substantial encouragement for an early movement. There is less anxiety to provide pig for winter work than there was one or two weeks ago. This quiet condition, however, may suddenly give way. A great deal of iron is being melted up. Should buyers find business coming in briskly, they will probably hurry in and buy largely. Bessemer is quoted at \$13 to-day; low phosphorus, \$16; basic, \$11, with a large sale at \$10.85 local delivery; No. 1 X Foundry is \$12@12.50; No. 2 X Foundry \$11.25@11.75; No. 2 plain, \$11; gray forge, \$10.50; ordinary, \$10.25. Mill owners have as a rule only moderate quantities of iron under their control.

Billets.—The buyers hereabout do not accept the view that billets are liable to advance. Prices are close to \$19. Buyers are not in urgent need and in fact are not booking sufficient new business to warrant them in buying at present. Everything hinges on how the billet buyers get orders for winter work.

Merchant Bars.—There are indications of a slacking up of demand, much to the discomfiture of mill men. Some are well fixed, others who are not have weakened prices by low offers to induce business. Refined iron is selling at 1.15@1.30c., according to circumstances. Steel bars sell all the way from 1.20 to 1.50c.

Sheet.—The week brought in several good orders for sheets and there are prospects that the easy prices will act as a stimulus on many large consumers to buy all they want for winter.

Pipes and Tubes.—Pipe is not particularly active, but there is a stronger demand for tubes and there is no trouble in getting good prices, particularly on prompt delivery.

Merchant Steel.—The distribution of merchant steel is fair, but some large concerns have decided to not buy before December for midwinter unless more urgent necessity arises.

Plates.—The filling up of Western competing plants and the well-sold-up condition of our local mills has brought about a better state of affairs, prospectively at least. New business will command better prices. While there has been no pronounced advance within a week, prices are better. Tank is 1.20c.; universals, 1.25c.; flange, 1.30c.; fire-box, 1.50@2c.

Structural Material.—Angles are selling at 1.20c., and beams and channels at 1.25c. The mills are all well supplied with business. Big orders are said to be within grasp and that a few days may show some good business.

Steel Rails.—For some reason the frequent inquiries for rails do not result in orders. Authorities say a great deal of business is being shaped up, and that certain eastern roads will be buyers.

Old Rails.—The rush is over and buyers now predict a weakening from present quotations—\$14@15.

Scrap.—A more moderate movement is in progress at current prices.

Pittsburg. Oct. 28.
(From Our Special Correspondent.)

The iron and steel market continues to give a

good account of itself this week. The mills are rushed with orders; the iron industry waits, because possible production for the year has been practically ordered, while neither buyers nor sellers regard contracts at present rates for next year's business as quite safe. The volume of business has been very fair, in some lines liberal, and in all departments prices have been well maintained. There is now a slight tendency to restrict operations pending some clearer understanding in regard to values. Sellers have about as many orders as they care to accept at present prices, and as this applies all around, it will naturally lead to a quiet market temporarily. The general situation is very satisfactory, however, as there is considerable urgency to secure prompt deliveries, and no requests for postponements. The statistical position of the market is very favorable, showing as it does a large decrease in the stock of pig iron in first hands. Another favorable showing may be counted on for October, but after that it is expected that supply and demand will be more in proportion and prices will probably be quoted for 1898 with more freedom than is being done at the present time. The general opinion is that the recent setback is a good thing, as it will induce conservative action both as regards prices and production. There is a disposition on the part of the pig iron producers to curtail making any further engagements for this year as they are by no means satisfied that the present cost of production will be safe next year.

Wire Nails.—Dealers report an improved demand; the advance previously noted has been maintained, \$1.50@1.55; some firms are considerably behind on deliveries.

Wire Rods.—The demand continues very active for early delivery. The sales within a few days exceed 12,000 tons at \$24.

Wrought Iron and Steel Pipe.—There is no falling off in the demand; shipments continue as fast as made.

Sheet Bars.—These are very firm with a good demand, the week's sales being liberal at \$19.25@19.75.

Muck Bars.—Muck bars are firm and in good demand at \$19.50@19.60.

Steel Rails.—Prices are firm but business not very active; current rates are \$19@20 per ton Pittsburg.

Latest.—There is nothing of special importance going on. There is a fair demand for most leading products; prices, however, show little, scarcely any, change. The trouble at present is to fix the prices for iron for next year's delivery. That seems a difficult matter, so buyers and sellers have different views on the subject. Carnegie's railroad was opened on Monday, and an immense train of ore was brought on that day from Conneaut to North Bessemer. The train consisted of 52 steel cars and one of the enormous locomotives built for this traffic: the ore in the train weighed 1,515 tons.

COKE SMELTED, LAKE AND NATIVE ORE.		SHEET BARS.	
Tons.	Cash.	Tons.	Cash.
5,000 Bess., N., D., V.	\$10.90	2,000 Delivered, Pitts.	\$19.75
3,500 Bess., No., D., V.	9.85	1,000 Delivered, Pitts.	18.50
3,000 Bess., O., P.	10.40	500 Delivered, Pitts.	18.20
2,000 Bess., N., V.	9.92	10 at mill, Pitts.	19.00
1,500 Bess., pro't, P.	10.75	MUCK BAR.	
1,000 Mill Ir., O., P.	10.60	1,000 Neutral, D., Pitts.	\$19.50
1,000 Mill Ir., N., D., P.	9.85	350 Neutral, Pitts.	19.30
1,000 Mill Ir., N., D., P.	9.75	STEEL WIRE RODS.	
1,000 Bess., J., F., V.	10.40	2,500 Delivered, Pitts.	\$23.00
1,000 Bess., O. to J., V.	10.10	SKELP IRON.	
500 Mill Ir., O., P.	9.90	850 W. G., Pitts.	\$1.25 4 m.
500 No. 2 F., P.	10.50	600 N. G., Pitts.	\$1.25 4 m.
500 Bess., pro't, P.	10.79	500 Sh'd., Pitts.	\$1.37 1/2 4 m.
500 Bess., Oct. P.	10.75	SKELP STEEL.	
300 Bess., pro't, P.	10.75	800 W. G., Pitts.	\$1.10 4 m.
200 No. 1 F., P.	11.25	750 Sh'd., Pitts.	\$1.20 4 m.
200 No. 2 F., P.	10.50	650 N. G., Pitts.	\$1.10 4 m.
CHARCOAL.			
200 L. S. W. Blast, P.	\$14.75	BLOOMS, BILLETS, BAR ENDS.	
100 Miss. W. Blast, P.	15.00	1,200 Billet ends, P.	\$11.40
50 No. 2 F., P.	15.25	OLD RAILS.	
50 No. 2 F., P.	15.25	1,000 S. R., gr., Pitts.	11.00
50 No. 2 F., P.	15.25	500 I. R., gr., Pitts.	15.00
50 Cold Blast, P.	21.50	300 S. R., gr., Pitts.	11.00
BLOOMS, BILLETS, SLABS.			
1,500 Bill., N., D. Mill	\$17.00	500 No. 1 C. D., E.	\$9.75
1,200 Bill., O., N., M.	17.00	P.	12.00
1,000 Bill., O., Mill	16.40	300 W. S., net, P.	13.00
800 Bill., N., D., Mill	16.85	200 W. S., net, P.	13.00
600 Bill., O., N., Mill	16.75	200 No. 1 C., gr., P.	9.50
500 Bill., O., N., Mill	16.45	200 No. 1 W. S., net, P.	12.30
500 Bill., N., Mill	17.00	150 O. C. W., gr., Pitts.	10.50
500 Bill., Prompt, M.	16.75	100 M. S., gr., Pitts.	11.00
		100 W. T., gr., Pitts.	7.50

METAL MARKET.

NEW YORK, Friday Evening, October 29, 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 \$.
23	4.84 3/4	27	58 3/4	.450	27	4.85 1/4	27 1/2	58 1/2	.450
25	4.85 1/4	27	58	.449	28	4.85 3/4	27 1/2	58 3/4	.450
26	4.85 3/4	27 1/2	58	.449	29	4.85 3/4	27 1/2	58 3/4	.450

The market for spot silver has been firm. This

has been occasioned not so much by a great demand as by the fact that a large part of the smelters' product has been sold forward, leaving only a portion of the output for sale for cash. Futures are 2 to 3% below spot prices.
The United States Assay Office in New York reports the total receipts of silver at 216,000 oz. for the week.

Average Monthly Prices of Silver

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

Month.	1897.		1896.		1895.	
	Lon- don. Pence.	New York. Cents.	Lon- don. Pence.	New York. Cents.	Lon- don. Pence.	New York. Cents.
January	29.74	61.79	30.69	67.13	27.36	59.69
February	29.68	61.67	31.01	67.67	27.47	59.90
March	28.96	63.06	31.54	68.40	28.53	61.98
April	28.56	61.85	31.10	67.52	30.30	63.61
May	27.88	60.42	31.08	67.88	30.61	68.75
June	27.58	60.10	31.46	68.69	30.47	68.64
July	27.36	59.61	31.45	68.75	30.48	66.75
August	24.93	54.19	30.93	67.34	30.40	66.61
September	25.66	55.24	30.19	65.68	30.54	66.90
October	.....	.....	29.68	65.05	30.89	67.64
November	.....	.....	29.46	64.98	30.79	67.40
December	.....	.....	29.70	65.24	30.40	66.47
Year	.....	.....	30.67	67.06	29.53	65.28

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

Gold and Silver Exports and Imports

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

Coin and bullion.	Exports.		Imports.		Total ex- cess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
Sept.	\$54,787	\$4,214,383	.....	\$133,318	I. \$4,623,314
1897.	32,501,491	13,027,703	.....	\$95,948	E. 16,033,911
1896.	56,874,816	61,888,856	114,291	1,330,291	I. 9,260,099
Silv.					
Sept.	4,572,594	616,548	.....	2,225,690	E. 1,700,556
1897.	42,337,460	7,571,291	259,330	16,097,670	E. 18,927,919
1896.	46,475,011	8,451,637	564,842	13,241,585	E. 25,343,661

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

Gold and Silver Exports and Imports, New York.

For the week ending October 29th, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

Per- iod.	Gold.		Silver.		Total Ex- cess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Week	\$5,689	\$210,033	\$675,414	\$38,428	E. \$432,642
1897.	48,137,851	13,295,666	33,108,527	1,967,055	E. 34,842,157
1896.	49,171,918	71,561,955	31,214,481	3,318,080	I. 2,993,606
1895.	58,752,257	27,351,473	32,541,902	1,455,620	E. 62,487,066
1894.	85,346,266	15,225,995	29,178,240	1,519,067	E. 97,779,444

The gold exported for the week went to the West Indies; the silver went principally to London. The gold and silver imported came from Central and South America and the West Indies.

FINANCIAL NOTES OF THE WEEK.

There has been little of importance to note in general business during the week. Conditions have not changed, but improvement is rather slow, and many men are still inclined to be cautious. The shadow of the approaching meeting of Congress is already perceptible. While very few anticipate any action this year on financial questions, there is apprehension of indiscreet action on the Cuban and other troublesome foreign matters.

Accounts from abroad are more and more unfavorable as to the harvests, and all doubts about a heavy demand for our grain have been removed. Wheat, the price of which subsided after the excitement of a few weeks ago, has again gone over \$1 a bushel in New York. The railroads continue to report increase in traffic, and also that their feet are sure of a heavy winter business.

The movement of currency from New York to interior points is decreasing, though it is still large in amount. Money is in good supply for most purposes, though there has been some curtailment in speculative loans.

No further imports of gold at New York are reported, though a considerable amount is still on the way from Australia to San Francisco. The higher rates for money in London and on the Continent have held the outflow of gold in check for the time. The rates abroad are relatively so much higher that it pays New York to lend in Europe, and it is understood that there have been considerable transactions of this kind. The selling of American securities by foreigners has almost ceased for the time, and with the continued heavy exports it is quite probable that shipments of gold may be resumed before long.

The statement of the United States Treasury, on Thursday, October 25th, shows balances in excess of outstanding certificates as below, comparison be-

ing made with the statement for the corresponding date last week:

	Oct. 21.	Oct. 28.	Changes.
Gold	\$151,411,148	\$152,875,100	I. \$1,463,952
Silver	14,296,394	15,499,747	I. 1,203,353
Legal tenders	40,262,584	39,336,432	D. 926,152
Treasury notes, etc.	10,875,994	8,053,538	D. 2,822,456

Totals..... \$216,846,110 \$215,764,717 D. \$1,081,393
Treasury deposits with national banks amounted to \$17,535,066, a decrease of \$28,188 during the week.

Imports of specie by water at San Francisco in September were \$3,630,646 gold and \$146,222 silver. For the nine months ending September 30th the imports were as follows:

Gold bullion	\$864,008
Gold coin	5,339,419
Silver bullion	1,219,894
Silver coin	325,490
Total	\$7,948,811

All this specie went through the Customs House. A much larger quantity was received overland, which did not pass through that agency.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending October 23d gives the following totals, comparison being made with the corresponding weeks in 1896 and 1895:

	1895.	1896.	1897.
Loans and discounts	\$502,432,800	\$450,119,500	\$62,175,400
Deposits	530,633,200	418,482,800	617,465,200
Circulation	14,050,300	20,510,600	15,970,900
Reserve:			
Specie	63,151,700	60,232,300	100,736,300
Legal tenders	83,201,300	66,849,300	76,514,700
Total reserve	\$149,353,000	\$127,681,600	\$177,271,000
Legal requirement	132,653,300	112,120,700	154,366,300
Surplus reserve	\$16,689,700	\$14,960,900	\$22,904,700

Changes for the week this year, were increases of \$1,385,000 in deposits, \$104,200 in circulation, \$5,860,000 in specie, \$2,776,000 in legal tenders, and \$8,290,000 in surplus reserve; and a decrease of \$6,941,600 in loans and discounts.

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

Banks.	1896.		1897.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Assn.	\$60,332,300	.....	\$100,756,300	.....
England	180,910,365	.....	159,640,835	.....
France	387,740,471	\$246,118,766	391,913,700	\$241,308,200
Germany	210,285,000	.....	200,825,000	.....
Austro-Hun.	144,880,000	63,515,000	189,849,000	62,065,500
Netherlands	13,175,000	33,645,000	13,145,000	33,600,000
Belgium	19,815,000	.....	20,648,600	.....
Spain	42,640,000	50,530,000	45,135,000	62,185,000
Italy	61,110,000	21,630,000	62,575,000	12,135,000
Russia	443,485,000	.....	593,820,000	.....

The returns for the Associated Banks of New York are of date October 23d; the Bank of Italy, September 20th; the Bank of Russia, September 23d; October 5th; the Banks of Spain and the Netherlands, October 9th; the Bank of Belgium, October 21st; the others are of date October 28th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Shipments of silver from London to the East for the year up to October 14th are reported by Messrs. Pixley & Abell's circular as below:

	1896.	1897.	Changes.
India	\$3,344,978	\$4,572,706	I. \$1,227,728
China	654,413	302,287	D. 352,126
The Straits	545,686	388,837	D. 156,849
Totals	\$4,545,077	\$5,263,860	I. \$718,783

Arrivals for the week, this year, were \$147,000 in bar silver from New York, \$30,000 from the West Indies and \$10,000 from Australia, a total of \$187,000. Shipments for the week were \$81,350 in bar silver to Bombay, and \$30,000 to Calcutta; also \$70,400 in Mexican dollars to Penang, and \$18,274 to Hong Kong; a total of \$200,024.

Indian exchange has fluctuated very little, bills selling at about 15-63d. per rupee. The purchases of silver for India have been very light. It is generally understood that no more Council bills will be offered before the close of the year, and remittances must be made either in silver or commercial bills.

Minister Powell writes from Port au Prince, Haiti, to the State Department under date of September 15th, 1897, substantially as follows: A proposition is now pending before the Chamber of Deputies to consolidate the several debts of the Republic into one national debt, destroy the paper money in use, and substitute a gold currency based on the United States gold dollar as a unit of value. The government will endeavor to secure a loan from some large banking houses in the United States to the amount of \$6,000,000, the rate of interest to be 6% per annum. The government hopes by means of the loan to reduce the present high rate of premium (now 180%), and raise the value of the bonds. The interest on these bonds is to be paid in gold at the above-named rates. The present rate is 5%, payable in Haitian paper cur-

rency, which is legal tender for all dues collected by the government through the customs. The rate of exchange is controlled by two or three bankers, who loan money to the government at a high rate of interest—18% per annum. Thus the government is kept constantly in debt.

The foreign merchandise trade of Great Britain is given by the Board of Trade returns as below for the nine months ending September 30th:

	1896.	1897.
Imports	£316,293,512	£329,855,835
Exports	222,160,429	222,001,170

Excess, imports..... £94,133,083 £107,857,645

The increase in imports was £13,665,323, or 4.4%, and the decrease in exports £150,230, or 0.1%. The movement of gold and silver for the nine months was as follows:

	Imports.	Exports.	Excess.
GOLD:			
1897	£24,294,931	£22,176,013	Imp. £2,118,918
1896	19,946,955	20,429,414	Exp. 482,459
SILVER:			
1897	13,124,163	14,112,170	Exp. 988,007
1896	10,788,570	11,228,233	Exp. 439,663

Imports of gold from the United States this year were only £57,700, and exports to the same country, £202,700. Of the silver imported the United States furnished £7,442,094, or 56.7% of the total.

The London Statist says: "The exports of silver in September were appreciably smaller than they were in August, when it will be remembered they amounted in value to nearly £3,000,000, of which Russia took £1,096,000 and India £944,000. In September they have been only £1,313,000, of which Russia has taken no more than £461,000 and India £644,000. In September, 1896, the value of the exports of silver amounted to £1,816,000, of which £917,000 was for France, £446,000 for India, and £345,000 for the British East Indies. In September, 1895, the total value was only £922,000, of which Russia took practically nothing, India £418,000, and China £312,000. The imports in September were £1,458,000, of which £782,000 came from the United States, and as much as £267,000 from Belgium. In the nine months to the end of September the value of the imports of silver has been £13,124,000, as against £10,788,000 in the corresponding period of 1896, and under £8,000,000 in 1895, an expansion in the two years of over £5,000,000. Of this large increase the United States provided only a relatively small portion, £1,400,000, whereas the arrivals from Belgium increased £1,600,000 compared with two years ago, from France the increase has been £1,000,000, and from Mexico over £400,000. This large increase in imports has been attended by an even larger expansion in exports, the value of the exports having been no less than £14,112,000 in the past nine months, as against only £7,676,000 in the corresponding period of 1895, an increase of nearly £6,500,000. Of these large purchases Russia in the past nine months has bought nearly £5,281,000, as against only £1,083,000 in the first nine months of 1895, while India has bought £4,933,000 against £3,323,000 in 1895, Belgium £1,297,000 against practically nothing in 1895, Germany £645,000 against £182,000 two years ago; while China has reduced its purchases to only £224,000 this year against £1,718,000 in 1895. We now understand, however, that the Russian order is completed, the Russian government having purchased the amount contemplated when the currency reform was undertaken. It will, consequently, be interesting to see what effect the reduced demand will have upon the price, and also whether the French sales of silver will now cease."

Prices of Foreign Coins.

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

	Bid.	Asked.
Mexican dollars	\$.45	\$.46 1/2
Peruvian soles and Chilean pesos	.41	.43
Victoria sovereigns	4.84	4.88
Twenty francs	3.83	3.87
Twenty marks	4.73	4.77
Spanish 25 pesetas	4.77	4.80

Other Metals.

Copper.—The declining tendency has made further progress and sales are reported at rather lower values. Lake copper has been pressed for sale from several quarters at 11c., and although the larger companies are unwilling to book orders thereat buyers are able to supply their wants at the figure. Electrolytic copper also has been selling at rather lower values, and we have to reduce the quotations for cakes, wirebars and ingots to 10 1/2c. and for cathodes to 10c. Casting copper has been dealt in in retail lots only and the quotation is nominally 10c. As is not uncommon in a dull market, consumers are holding off awaiting further developments.

The London market has been very flat, and prices have declined fully 10s. for the week, the lowest price being reached to-day, £47 15s. @ £47 17s. 6d. for spot and £48 @ £48 2s. 6d. for three months prompt. Fine copper has been rather pressed for sale abroad and values have suffered considerably. Consumption in Europe continues to be very good, and under the circumstances, the heavy decline is not easily explained. We quote for refined and manufactured: English tough, £50 @ £50 10s.; best selected, £50 10s. @ £51; strong sheets, £58; India sheets, £56 10s. @ £57; yellow metal, 4 1/2d.

Tin.—There is continually a good demand from consumers and deliveries continue on rather a heavy scale, but prices are rather depressed, and if anything below the parity of the London market. Shipments from the East have, since the beginning of the year, fallen off considerably, and in consequence thereof the statistical position shows quite an improvement. Unless silver again declines heavily, an improvement in prices is predicted in many quarters. We quote for spot and nearby delivery 13 3/4c., and for futures 13 9/16c. and 14c.

In London prices at the beginning of the week opened 5s. lower, and the day after dropped another 10s. Then a slight improvement set in, and the closing quotations are £32 10s. @ £32 12s. 6d. for spot and £33 2s. 6d. @ £32 5s. for three months prompt.

Lead.—Early in the week the market looked rather better and a good business was doing at somewhat improved rates, but later on refiners again appeared to be anxious to market quantities, in consequence of which the improvement was lost, and at the close there are sellers over at 3 9/16c. In St. Louis business is reported at 3 7/8c.

The foreign market remains quiet but steady, Spanish lead being quoted £13 10s., and English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is dull and very quiet. Common sell nominally at 3 7/8c., and corroding at 3 8/16c. Neither buyers nor sellers are making any special efforts to trade, and from present indications the market is liable to remain in its present state for some little time to come.

Spelter continues somewhat irregular, but the tendency is rather towards lower quotations, and we have to quote 4 1/2c. for good prime western. From St. Louis it is reported that most producers are asking 4c., but some sales have been made at 3 9/16c. Exports from the United States in September were 303 long tons spelter and 1,147 tons zinc ore.

The English market is without any material change, and good ordinaries in London are quoted at £17 17s. 6d. with specials 2s. 6d. higher.

Antimony.—Only a retail business has been doing, and the quotations are unchanged at 7 1/2c. @ 8c. for Cookson's; 7 1/4c. @ 7 1/2c. for Hallett's; 7 1/4c. for Japanese and 7 1/2c. for U. S. Star.

Nickel.—Business is quiet, and no change in prices can be reported. We quote for ton

lots 33 1/4 @ 36c. per lb., and for smaller orders 35 1/2 @ 38c. London prices are 14 @ 16d. per lb., according to size of order. The London price is about on a parity with New York, allowing for the duty of 6c. per lb.

Platinum.—Prices are still quoted at \$14 @ \$15 per oz. New York. The London quotation is 55s. @ 56s. per oz. Supplies are not large, however, and there is a strong upward tendency.

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, 57c., 58c., and 59c. per gram. Wire and foil are 55c., 56c. and 57c. per gram.

Quicksilver.—The New York price has been increased \$1 and is now \$38 50 per flask. The London price has also been increased and is now £7 per flask, with £6 18s. 9d. quoted from second hands.

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

Aluminum: No. 1, 98% ingots, 34 @ 40c.	Bismuth, 3 lb. ...	\$1.50 @ \$1.50
No. 2, 9% " " 31 @ 34c.	Phosphorus, 5 lb. ...	50 @ 55c.
Rolled sheets, " 38c. up	Tungsten, 5 lb. ...	70c.
Alum.-Nickel, " 33 @ 39c.	Tungstic acid, ...	45c.
	Ferro-tungsten, 6% ...	60c.

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	3.01	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	10.38	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	13.39	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	13.80	13.49	3.81	2.73	4.26	3.76
Sept.	11.30	10.66	13.98	13.15	4.30	2.77	4.18	3.60
October	11.13	10.66	13.88	13.94	4.00	2.80	4.17	3.72
Nov.	11.23	11.23	13.69	13.69	2.96	2.96	4.14	3.90
Dec.	11.28	11.28	12.96	12.96	3.04	3.04	4.14	3.94
Year ..	10.88	10.88	13.29	13.29	2.98	2.98	3.94	3.94

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements see page 540.)

New York. Oct. 29.

Heavy Chemicals.—Perhaps the most business in a transient way was done earlier in the week; at the close the market has fallen again into its usual quiet condition. Prices are unchanged. We quote: Caustic soda, 60%, \$2.10 @ \$2.20 per 100 lbs. Alkali, domestic, 58%, 65 @ 67 1/2c. for 50-ton lots and over, and 70 @ 80c. for smaller quantities; 48%, \$1 @ \$1.20 for jobbing lots. Foreign, 72 1/2 @ 77 1/2c. 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 7/8 @ 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, \$9.37 1/2 @ \$9.75 per 100 lbs.

Acids.—Almost in every line of the acid trade the demand has been rather good this week, at unchanged prices. 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 bbls., \$1.70 @ \$1.80; in carboys, \$1.90 @ \$2.05. Muriatic acid, 18%, 75 @ 85c.; 20%, 85 @ 95c.; 22%, \$1.15 @ \$1.25, according to make and quantity. Nitric acid, 36%, \$3.50 @ \$4.40; \$4 @ \$4.50; 42%, \$4.50 @ \$5.50. Oxalic acid, \$7 ex-dock and \$7.25 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66%, 70 @ 85c. in carload lots, 10 @ 15c. higher for small quantities. Chamber acid, 50%, \$6 @ \$6.50 per ton at factory. Blue vitriol, \$3.62 1/2 @ \$3.75, according to grade and order.

Brimstone.—This market continues dull and quotations are \$21.50 @ \$22 per ton for best unmixed seconds on spot and \$22 to arrive. There was an arrival this week of 1,360 tons.

Fertilizing Chemicals.—This market is quiet. Leading ammoniates were purchased in such quantities in the latter part of the summer and early fall that manufacturers have enough supplies on hand to keep them going for some little time. Quotations are unchanged. We quote: Sulphate of ammonia, gas liquor, \$2.17 1/2 @ \$2.20; bone, \$2.10 @ \$2.15 per 100 lbs. Dried blood, high grade Western, \$2.25 @ \$2.30 per unit New York; \$2 per unit f. o. b. Chicago. Azotine, \$1.65 @ \$1.70 basis New York. Concentrated phosphate (30% available phosphoric acid), 57 1/2c. per unit. Acid phosphate, 13% @ 15%, av. P₂O₅, 55 @ 60c. per unit at sellers' works in bulk. Dissolved bone black, 17% @ 18% P₂O₅, \$10 @ \$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, \$1.90; Philadelphia, Baltimore and Norfolk, \$2.01; Southern ports, \$2.03.

Double Manure-Salt: Quotations for 48 @ 49%, less than 2 1/4% chlorate, are 1 01 @ 1 01 1/2c., to arrive, and 1 02 @ 1 03c. on spot; basis of 48%. High grade, 90 @ 93% sulphate of potash, 1 00 1/2 @ 2 00 1/2c. to arrive; basis of 90%. In bulk 24 @ 36%, 36 1/2 @ 37 1/2c. per unit phosphate acid.

Muriate of Potash: We quote: New York and Boston, 1 75 @ 1 78c. Philadelphia and Norfolk, 1 76 @ 1 79 1/2c.; Charleston, Savannah, Wilmington and New Orleans, for 80 @ 85% basis of 80%, 1 78 1/2 @ 1 81c. in lots of 50 tons and upward.

Kainit.—Invoice weights, as taken at port of shipment, per ton of 2,240 lbs., testing 12 1/4% actual potash, equivalent to 23% sulphate of potash, \$8.80 @ \$8.90.

Nitrate of Soda.—This market continues inactive, with quotations as follows: Spot, \$1.62 1/2 per 100 lbs., near-by \$1.60; futures, \$1.57 1/2.

NOTES OF THE WEEK.

The shipments of phosphate rock from Mt. Pleasant, Tenn., during September amounted to 3,426 tons, of which 7,346 tons were domestic and 2,080 tons for foreign consumption. Stocks on hand, October 1st, were estimated at 16,000 tons.

Valparaiso, Chile. Sept. 11. (Special Report of Jackson Brothers.)

Nitrate of Soda.—During the fortnight producers have abstained from offering 95% nitrate, although 96% has been freely offered for all deliveries at 5s. 3d. alongside. On the other hand, we find no demand at the late prices for 95%. We quote 95% 5s. 1 1/2d.; refined, 5s. 2 1/2d. per quintal for September-December deliveries. The price of 5s. 1 1/2d. with 25s. freight stands in 6s. 11 1/2d. per cwt. and freight, with purchasing commission. Sales for the fortnight were 502,500 quintals.

MINING STOCKS.

Complete quotations will be found on pages 536, 537 and 538 of mining stocks listed and dealt in at:

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

New York. Oct. 29.

The month closes with mining stocks in little demand, and prices in the majority of cases lower than in September. At the Consolidated Stock and Petroleum Exchange business this week has been quiet, while on the Mining Exchange it has been dull. Both boards attribute the lack of interest in mining stocks to the turmoil of local politics. Nevertheless, there was some inquiry for the Comstocks, and of these we note that Comstock Tunnel was dealt in at 4c., which is the first sale since September 28th last. Best & Belcher showed quite a fall in price, being quoted at 47c. at the opening, and at 42c. a day later; these prices are from 13c. to 18c. less than last week. Barcelona was traded in this week at 3 @ 5c., after an absence of four months; the last sale was made on July 12th at 4c. Consolidated California & Virginia continues to recede, and was sold at \$1.25, against \$1.40 last week and \$1.95 a few weeks ago; the first named quotation is the lowest since August 25th, when it was \$1.10 Hale & Norcross sold at \$1.15, which is 10c. less than three weeks ago. The assessment of 10c. per share on this stock which was levied several months ago is still unpaid. Ophir was traded in at 88c., which is a drop of 17c. since September 23d last. Potosi opened at 50c., and then sold down to 48c., which is 3c. better than a few weeks ago. Yellow Jacket changed hands at 54c. at the close, a price which is 11c. less than at the same time two weeks ago.

Of the California stocks Standard Consolidated was sold at \$1.70 @ \$1.75, an advance of from 10 to 15c. since last week. This stock was bid down to \$1.60 at the close to-day. Brunswick continues to recede in price, and was sold at 9 @ 10c. this week, against 20c. at the beginning of September. There is a fair amount of business doing in the Colorado stocks. Of the Cripple Creek stocks, Portland sold at 75c., which is 3c. less than two weeks ago. Isabella opened at 26 1/2c. and rose to 26 3/4c., which prices are slightly less than a week ago. Pharmacist ruled fairly steady at 9 1/2 @ 10c., a drop of only 1c. since a week ago. Union hovered between 18 and 19c., while work sold at 3 1/2 @ 5c. Anaconda gold was traded in at 44c., and Cripple Creek Consolidated at 8 to 9c.

Of the other Colorado stocks Mollie Gibson sold at 19 @ 20c. Small Hopes, which had not been dealt in since August 30th last, sold at 50c. on October 26th—a falling off of 10c. in price between the two periods mentioned. Annetta was held stationary at 46c. and Miami at 41c. The Wilcox tunnel, the property of the Miami Mining and Milling Company, we are informed, begins at the town of Idaho Springs, Colo., about 2,000 ft. from the railroad sampler and reduction works, and is already driven a distance of over 1,600 ft. Two blind leads are said to have recently been encountered on this property.

The Utah stock, Horn Silver, has been inquired for in a good way this week on the Consolidated Exchange, and was sold at \$1.55 @ \$1.60, which is a material advance from a few weeks ago when the

Imports and Exports of Metals.

Port.	Week, Oct. 21.		Year, 1897.	
	Expts.	Impts.	Expts.	Impts.
*New York.				
Aluminum, boxes			3,172	
Antimony ore, short tons				1,470
" regulus, casks				471
Brass, old, short tons	24		583	
Copper, fine, long tons	662	84	41,855	6,136
" ore, long tons				8,024
" matte, " "	100		5,395	271
" sulphate, " "				4,686
Ferro-chrome, " "				10
Ferro-manganese, " "	65		3,079	52
Iron ore, " "				19
" old, " "				52
" pipe, " "	50		235	
" pig, bar, rod, " "		502	11,282	4,006
" pyrites, " "				7,670
Lead, antimonial, " "				100
" bullion, " "	550	1,184	30,854	59,327
Manganese ore, " "		97		5,485
Nails, " "				781
Nickel, " "	10		1,128	115
Rails, old, " "			11,151	
Spiegelisen, " "			15,387	11,658
Steel billets, rods, " "		700	15,692	17,533
Tin, " "		350	1,216	9,199
" dross, " "	204		375	
" and black plates, boxes		12,475	286,858	
Zinc, long tons		25	3,193	1,114
" dross, " "	9		407	
†Baltimore.				
Brass scrap, long tons			9	
Chrome ore, " "			21	5,511
Copper, fine, " "	692		33,733	
" sulphate, " "	15		1,794	
Ferro-manganese, " "			3,455	385
Ferro-silicon, " "				231
Iron ore, " "			2,756	220,791
" pig, bar, etc., " "			3,960	2,670
" pipe, " "	32		318	
Lead, " "				500
Manganese, " "				247
Rails, steel, " "				4,451
Spiegelisen, " "		15		1,846
Steel, " "	104		5,186	4,030
" wire, bundles	43		1,656	11,618
Tin, long tons				5,744
" and black plates, boxes				19,687
Zinc, long tons				48
" dross, " "				135
‡Philadelphia.				
Antimony, casks				2,712
Chrome ore, " "				300
Copper ore, long tons				10,579
Ferro-manganese, " "				122
Iron ore, " "				153,802
" pig, " "				50
" pyrites, " "				4,550
Manganese ore, " "				41,673
Tin, " "				668
" and black plates, boxes				47,677

*New York Metal Exchange returns. †From our Special Correspondent. ‡Week ending, Oct. 23. § Week ending Oct. 28.

stock was down to \$1.05. It is understood that the demand for this stock has been stimulated to a great extent by the rumor that the company would soon declare a dividend. We learn from an official that operations are being carried on systematically and that the good price at which lead was sold had helped to materially increase the earnings of the property.

The Lower California stock, Fortuna, holds steady at \$11.12 1/2 @ \$11.25, and many shares are reported sold. The company has recently declared dividend No. 14 of 10c. per share, amounting to \$10,000, and making the total distributed thus far \$140,000. The latest dividend is payable to day, October 29th, at the office in New York City.

The Canadian stock, Yukon, is still quoted between 10 1/2 and 11 1/2 c. It is said that the reason the stock dropped from the 10c. mark when it was listed on the Mining Exchange is that the Canadians unloaded their holdings on this market as the stock was being sold for materially less at home than in New York.

New applications for membership are being considered at the Mining Exchange, and it is also said that new companies will be listed in the near future. We would suggest that in order to assure legitimate transactions in mining stocks hereafter that the listing committee select only those securities that have full titles to their properties, and are doing actual work on them. Stocks that sell for a few dollars a thousand are certainly not advisable securities to call on the board nor to offer for public investment.

Boston. Oct. 28.

(From Our Special Correspondent.)

The market for copper stocks the past week has ruled dull, with a tendency to lower prices, and to-day's market has been weak, with free selling of the specialties which has dragged down the whole list. Centennial declined from \$18 1/2 to \$14, and Butte & Boston from \$25 1/2 to \$21. Boston & Montana advanced early in the week to \$14 1/2, but to-day it touched \$13 1/2, the lowest price for several months. Osceola was freely sold and declined from \$30 1/2 to \$26 1/2, and Old Dominion from \$23 1/2 to \$20, with a slight rally to \$20 1/2. Kearsarge was very dull, selling only in small lots at \$20 and \$18 1/2. Franklin advanced to \$21 1/2, but in final dealings sold off to \$20. Atlantic declined from \$24 to \$23 and Wolverine from \$16 1/2 to \$14 1/2. Calumet & Hecla declined to \$460, at which price all sales were made. Quincy sold at \$115 and down to \$112 and Tamarack declined \$6 to \$128. Arnold was off from \$4 to \$3 1/2 and Tecumseh to \$4.

The gold stocks were extremely dull. Gold Coin sold at \$1 1/2 @ \$2. Pioneer at \$5 1/2 @ \$6 1/2. Santa Ysabel declined from \$14 to \$12 1/2, and Merced from \$7 to \$6 1/2.

3 P. M.—There was a little firmer feeling after the noon hour. Boston & Montana advanced to \$138, and Butte & Boston to \$22. Centennial recovered to \$15 and Old Dominion to \$21. Calumet & Hecla was off \$2 to \$458 for three shares only, and Tamarack was steady at \$128. Kearsarge declined \$ 1/2 to \$18 1/2.

Cleveland. Oct. 27.

(From Our Special Correspondent.)

The iron mining stock market is considerably stronger at the present time, and the general tendency seems to be upward. Prospective investors offer \$1 1/2 more for Republic, \$1 more for Chandler and \$3 more for Cleveland Cliffs. The holders of Lake Superior ask \$3 more this week than last. Pittsburg and Lake Angelina have declined somewhat, \$5 less being bid for it.

Los Angeles, Cal. Oct. 23.

(From Our Special Correspondent.)

The market for the past week has been one in which so little interest has manifested itself that it certainly becomes a difficult problem to write anything of news or particular interest. The fact is the local horse races have monopolized the attention of nearly every one in Los Angeles, especially the brokers on the Exchange. In such a state of affairs, however, many good features can be noted, the first of which is that all stocks have held their own nicely with the possible exception of Rand Mountain, and that the market has remained firm, and in one or two instances advanced to quite a considerable extent. Rand Mountain, for some unaccountable reason, has tumbled severely. The fall is due entirely to a large block of stock being thrown on the market at just such a period as has occurred this week, when interest is at a low ebb and brokers are not inclined to give attention to their customers' wishes or solicit new business.

Magganetta continues to be the favorite, and it reached the 4c. mark on Thursday's market, closing strong at this figure with plenty of good orders in sight at and below present quotations. However, there is little or no Magganetta to be had at any price. Pacific Consolidated, contrary to all expectations, has not advanced, although it has held its own and that splendidly in the face of several large blocks of stock which were dumped on the market at a half and better. It is predicted that Pacific Consolidated will be the first shipping property on the board. East Amargosa has again advanced and remains strong, contrary to all predictions. The balance of the list is in about the same state as it was last week.

Salt Lake City. Oct. 23.

(From Our Special Correspondent.)

Dull and featureless typify the status of the traffic in Utah mining shares. Prices generally appear to be gradually settling to a lower level. The prosperity said to prevail throughout the country is not reflected in any way in the securities of this market, many of which are ruling lower than there is any warrant for, at a rate much below what the properties they represent can be sold for. Over 90% of the few transactions taking place are on local orders, some being nothing less or more than a game between brokers—a most unsatisfactory condition. Just at present there seems no evidence of a change for the better taking place.

On Monday the question of closing the Exchange for an indefinite period was considered at a large meeting of the brokers. After considerable discussion, when the question was finally put to a vote, it was decided without a dissenting voice to continue to hold the regular daily call, for the purpose of establishing quotations if nothing else, and several brokers evinced a disposition to endeavor to put an end to curb trading. This action was a surprise, an agreeable one, for a number had shown a determination to do away with the calls.

Galena and Northern Light lately have monopolized a large share of attention. The bears were after both and succeeded in pounding Northern Light to 50c., where it did business, while Galena held up in quite good form, selling at 58c. Friday and 57c. to-day. Conflicting reports are current on the economic results of the Northern Light mill and the shares are less in favor than two months since.

As intimated by President Dern a week ago, Geyser-Marion directors, at the meeting this morning, declared dividend No. 6, of \$9,000, payable November 1st. Transfer books close from October 25th till November 2d. On the curb this afternoon the shares showed greater strength, the bid moving up to \$1 15, at which figure several lots changed hands. Mercur is lower, and it looks as if \$7.50 is to hold as the asked quotation.

Mammoth is just now erratic. On the call it displays no particular strength, yet no sizable block—1,000 or more—is to be had, save at a handsome advance over the board's asked quotation. The mine and mill, it is said, are making another favorable record, and the indebtedness is about wiped out, Grand Central has a higher bid and excellent accounts come from the mine. South Swansea and Swansea are stronger, and each reports improved ore exposures.

Dexter has sagged off, perhaps in sympathy with most others of the active list. There is nothing new from the mine. Silver King continues the strongest on the list, with Daly West a close second. Each week signs of an early resumption of work in the latter mine become more pronounced.

San Francisco. Oct. 23.

(From Our Special Correspondent.)

The market was weak at the opening and a general decline in prices followed, quotations being made on very small transactions for the most part. An attempt was made to sustain prices, but without success. The decline continued, in spite of some large buying orders.

On Wednesday afternoon a lot of the small dealers were caught by a sharp little reaction, which carried prices up for a time. It did not last, however, and the next day prices were weak again, though a carefully engineered attempt at a boom in Sierra Nevada supported them for a while.

Toward the close the market was fluctuating and very unsteady. The North End and Middle Comstocks were a little stronger, but the Gold Hill stocks generally gropped. The market closed weak and unsteady.

Some quotations noted are as follows: Alpha, 10 @ 11c.; Alta, 12c.; Andes, 28c.; Belcher, 47@46c.; Best & Belcher, 49@51c.; Bullion, 8@9c.; Caledonia, 22c.; Challenge Consolidated, 34c.; Chollar, 55@57c.; Consolidated California & Virginia, \$1.35; Confidence, 95c. @ \$1; Crown Point, 45@43c.; Exchequer, 3c.; Gould & Curry, 34@35c.; Hale & Norcross, \$1.20; Julia, 2@4c.; Justice, 30c.; Kentuck, 6c.; Mexican, 44c.; Occidental Consolidated, \$1.10; Ophir, 94@95c.; Overman, 15c.; Potosi, 49@50c.; Savage, 41c.; Segregated Belcher, 10@11c.; Scorpion, 5c.; Sierra Nevada, 84@83c.; Silver Hill, 7c.; St. Louis, 9c.; Union Consolidated, 44@45c.; Utah, 16c.; Yellow Jacket, 48@49c. For Eureka Consolidated 20c. and for Standard Consolidated, \$1.60 was bid.

The annual meeting of the Great Western Quick-silver Mining Company has been called for November 3d.

The Reward Gold Mining Company, of Nevada County, has levied an assessment of 2c. per share, delinquent November 15th.

The Gold Eagle Mining Company, of Lyon County, Nevada, has levied an assessment of 1c. per share, delinquent November 15th.

The Central Eureka Mining Company, of Amador County, has levied an assessment of 1c. per share, delinquent November 20th.

Paris. Oct. 17.

(From Our Special Correspondent.)

The mining stock markets have fallen into a state of quiet for the time, and there has been no incident of moment during the week. The higher rates for money and the prospect of heavy foreign remittances to buy grain this fall are affecting speculation. Already we begin to see an end to the period of exceptional prosperity and activity, or at least a lull in activity. Our money is going to you this winter, but it will come back again in due time.

To-day to you, to-morrow to me—it is the rule of all finance.

There is more and more discontent in Paris and in all the large cities over the high price of bread, but the government declines to interfere with the duties on grain, so that there will be no relief. The matter may become serious before long.

There is a renewal of the discussion over the affairs of the Paris Bourse. The agents de change wish to enforce their privileges and put a stop to dealings by the coulissiers; but there is a good deal of feeling against confining all transactions in stocks to the little close corporation of 60 members which is nominally the Bourse. Technically and legally the agents de change have the best of it; but I think the coulissiers will hold their own in the end. Meantime, it is charged that the banks are quietly doing a great deal of business in securities which ought to be transacted through the Bourse.

The Minister of Commerce reports that the total imports of merchandise into France in September were valued at 288,189,000 fr., and the exports 305,190,000 fr. For the nine months ending with September the statement is as follows:

	1896.	1897.
	Francia.	Francia.
Imports	2,858,000,000	2,597,000,000
Exports	2,501,000,000	2,714,000,000
Excess imports	357,000,000	183,000,000

There was an increase of 79,000,000 fr. in the imports of raw materials, and one of 52,000,000 fr. in exports of manufactures.

The provisional report of coal production in France for the half-year ending June 30th gives the total at 14,950,179 tons, an increase of 589,707 tons, or 4 1/2%, over the first half of 1896.

The iron and steel production for the half year is reported as below, in metric tons:

	1896.	1897.
Pig iron	1,146,594	1,223,638
Wrought iron	391,666	405,696
Steel	956,783	1,104,961

The wrought iron made included 369,747 tons of bar and merchant iron, 35,577 tons of sheets and plates and 372 tons of rails. The pig iron made included 245,919 tons of foundry iron and 977,719 tons of forge and steel pig. All the departments of production show an increase this year.

One continues to hear a good deal about plans for developing the mineral resources of Madagascar, but progress seems slow. It is a fact, however, that several engineers are now making examinations in the island for parties who are prepared to put in money should the reports be favorable. The searches are not for the precious metals only, iron ores and coal being considered also as of great importance.

The interest in our colonial enterprises is on the increase, and it is probable that their development will receive a great deal of attention for some time to come.

Rosland, B. C. Oct. 20.

(From Our Special Correspondent.)

There is little of importance to note this week. Sir Charles Tupper and his party have been making quite an extended stay in this portion of the Kootenay country, and have now gone to Nelson and the other divisions to make a careful investigation of the outlook there. Sir Charles Tupper while here has been very guarded in his utterances, but his visit, especially at this time, is regarded as of more than ordinary importance, not only on account of his distinguished abilities, but owing to the investments which he has made in this district and those which he contemplates.

Before winter sets in a number of well-known properties, it is reported on good authority, will have resumed work. Those particularly mentioned are the White Bear, O. K. and Homestake.

MISCELLANEOUS DIVIDENDS.

The Exploration Syndicate, of which Frederick G. Corning is president, has declared a quarterly dividend of 2 1/2%, payable in New York on November 1st.

MEETINGS.

Four Aces Mining Company, special meeting, at the office, Room 500 Auerbach Block, Salt Lake City, Utah, on November 10th, at 2 p. m., for the purpose of amending the articles of incorporation so that assessments can be levied on the capital stock.

Leroy Mining Company, special meeting, in the office at No. 244 South Main street, in Salt Lake City, Utah, on November 23d at 2 p. m.

LATE NEWS.

The Philadelphia & Reading Coal and Iron Company's statement for September and the three months from July 1st to September 30th is as follows:

	September.	Three months.
Receipts	\$2,421,811	\$6,625,665
Expenses	2,335,204	6,270,218
	\$86,607	\$355,447

The expenses for colliery improvements are not stated separately, the form of the return having been changed since the reorganization.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Alice, Anaconda, and others with columns for location, par value, and prices for various dates in October.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Aetna Con., Alouez, Anaconda, and others with columns for location, par value, and prices for various dates in October.

* Official quotations Boston Stock Exchange. * Bid and ask quotations. Total sales, \$4,677.

BALTIMORE, MD. Week ending Oct. 23.

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 prices.

* 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 prices.

* From our special correspondent.

ASPEN, COLO.

Oct. 15.

Table of stock quotations for Aspen, Colo., listing companies like Agnes C, Aita 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 prices for various dates in October.

* Official quotations Colo. Springs Mining Stock Association. Total shares sold, listed, 333,331; unlisted, 280,350.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stocks, listing companies like American Coal, Col. C. & I. Dev., and others with columns for par value and prices for various dates in October.

* Official quotations. New York Stock Exchange, mining, 850 shares; other stocks, 26,897 shares; Consolidated Stock and Petroleum Exchange, mining, 15,650 shares; Mining Exchange, 274,500 shares. Total shares sold, 317,727. * Bid and ask quotations. * Ex-div.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, Pa., listing companies like Cambria Iron, T. T., and others with columns for location, par value, bid, and ask prices for various dates in October.

* Official quotations Philadelphia Stock Exchange. * Bid and ask quotations. Total sales, 13,224.

PITTSBURG, PA.

Oct. 27.

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

* Official quotations Pittsburgh Stock Exchange.

STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colo., listing companies like Acacia, Adie C., Alamo, and others with columns for par value, bid, and asked prices.

LOS ANGELES, CAL.

Table of stock quotations for Los Angeles, Cal., listing companies like Amargosa, Brown Dake, and others with columns for location, par value, and bid/asked prices.

Official quotations, Los Angeles Mining and Stock Exchange. Bid and ask quotations. Total sales, 131,700 shares.

SALT LAKE CITY, UTAH.

Week ending Oct. 23.

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Alliance, and others with columns for stocks, par value, and bid/asked prices.

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

ROSSLAND, BRITISH COLUMBIA.

Oct. 20.

Table of stock quotations for Rossland, British Columbia, listing companies like Abe Lincoln, Alberta, and others with columns for name of company, shares, and price.

From Our Special Correspondent.

HELENA MONT.

Week ending Oct. 21.

Table of stock quotations for Helena, Mont., listing companies like Am. Dev. & M. Co., Bald Butte, and others with columns for location, company's office, and price.

Special Report of Samuel K. Davis. Total shares sold, 5,330.

SAN FRANCISCO, CAL.

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

Official telegraphic quotations, San Francisco Stock Exchange.

MEXICO.

Week ending Oct. 12.

Table of stock quotations for Mexico, listing companies like Altanza, Amistad y Concordia, and others with columns for state, shares, and price.

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. Oct. 15. Table with columns: NAME OF COMPANY, Country, Authorized capital, Par value, Last dividend, Quotations. Lists various mining and engineering companies with their financial details.

PARIS. Week ending Oct. 8. Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Div. last year, Prices. Lists companies like Acieries de Creusot, Boleo, and others.

VALPARAISO, CHILE. Sept. 11. Table with columns: NAME OF COMPANY, Location, Capital paid, Sh. Val. paid up, Last Dividend, Prices. Lists companies like Arturo Prat, Caracoles, and others.

SHANGHAI, CHINA. Oct. 1. Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Price. Lists companies like Jelebu Mg. & Trad., Funjom Mg. Ltd., etc.

DIVIDENDS. Table with columns: NAME OF COMPANY, Current Dividends, Paid since Jan. 1, 1897, Total to date. Lists companies and their dividend payment schedules.

ASSESSMENTS. Table with columns: NAME OF COMPANY, Location, No., Dinq., Sal., Am. Lists companies and their assessment details.

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

G. Gold. S. Silver. L. Lead. C. Copper. B. Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Dividends paid since consolidation. § Dividends paid since consolidation. ¶ 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.

ALPHABETICAL INDEX TO ADVERTISERS.

(-) Indicates every other week or monthly advertisements.

Table with 4 columns (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z) listing various companies and their advertisement frequencies. Includes entries like 'Abbott, J. W.', 'Denver Fire Clay Co.', 'Raymond Lead Co.', etc.



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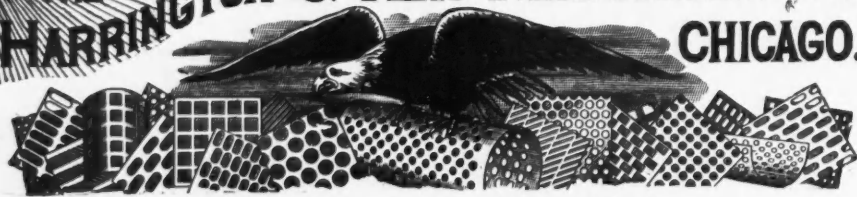
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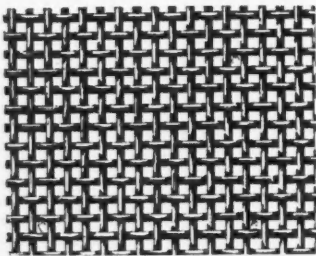
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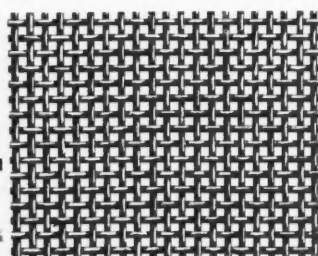
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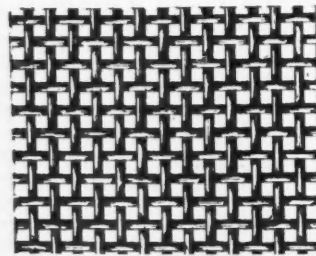
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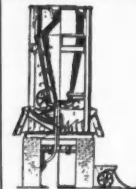
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 Buff & Berger.
 Bullcock & Crenshaw.
 Fauth, C.
 Gurley, W. & L. E.
 Engines.
 Bullcock, M. C. Mfg. Co.
 Colorado Iron Works Co.
 Davis, F. M., Iron Works Co.
 Fairbanks, Morse & Co.
 Fraser & Chalmers.
 Hercules Gas Engine Works.
 Lambert Hoisting Engine Co.
 Lidgerwood Mfg. Co.
 (See Machinery.)
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 Bucyrus Steam Shovel & Dredge Co.
 Marion Steam Shovel Co.
 Vulcan Iron Works.
 Fire-Brick and Clay.
 Chur, Walter.
 Denver Fire Clay Co.
 Standard Fire Brick Co.
 Finerspar.
 Fuerst Bros. & Co.
 Furnaces.
 Billin, Chas. E. & Co.
 Brown, Horace F.
 Denver Fire Clay Co.
 (See Machinery.)
 Fuses.
 Ingersoll-Sergeant Drill Co.
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 Gas Engines.
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 (See Machinery.)
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 Dixon, Jos. Crucible Co.
 Heavy Machinery.
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 Davis, F. M., Iron Works Co.
 Denver Eng. Works Co.
 Fraser & Chalmers.
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 Lamberts Hoisting Engine Co.
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 Okonite Co., Ltd.
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 Hartford Steam Boiler Inspect'n and Ins. Co.
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 Spanish-American Iron Co.
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 Vollmer & Beaton.

Lead Linings for Chlorination Tubs.
 Raymond Lead Co.
 Link Belt Iron. (See Belting.)
 Link Belt Machinery Co.

Locomotives.
 Burnham, Williams & Co.
 General Electric Co.
 Hunt, C. W. Co.
 Porter, H. E., & Co.
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 Detroit Lubricator Co.
 Lunkenheimer Co.

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 Bacon, E. C.
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 Blake, T. A.
 Bradley Pulverizer Co.
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 Colorado Iron Works Co.
 Davis, F. M., Iron Works Co.
 Denver Eng. Wks. Co.
 Fairbanks, Morse & Co.
 Fraser & Chalmers.
 Gates Iron Works.
 Gillette-Herzog Mfg. Co.
 Hammond, Mfg. Co.
 Hendrie & Bothoff Mfg. Co.
 Hodge, C. J.
 Ingersoll-Sergeant Drill Co.
 Jeffrey Mfg. Co.
 Joseph, W. & Sons, Ltd.
 Lambert Hoisting Engine Co.
 Lidgerwood Mfg. Co.
 Krupp, F.
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 Denver Eng. Wks. Co.
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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.

1546 WANTED—CHEMIST AND METALLURGIST 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 COMPETENT 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.

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 PRACTICAL 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.

1552 WANTED—COMPETENT MAN TO take charge of a mill and cyanide plant in a high and healthy part of South America, 40 miles from navigation. State experience, references and salary required. Address J. E. B., ENGINEERING AND MINING JOURNAL.

1553 WANTED, ASSAYER—AN EXPERIENCED assayer and chemist, familiar with gold mill work, and with at least some acquaintance with cyanide process, is wanted at once for a healthy region in South America; elevation 3,000 feet. Address, giving full experience, salary expected and references, SUCCESS, ENGINEERING AND MINING JOURNAL.

1554 MILLMAN WANTED FOR TEN-stamp mill, wet crushing with vanners. Must have good record of successful amalgamation work and well up in concentration; also knowledge of the cyanide process. Send copy of testimonials and state salary expected. Address MILLMAN, 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.

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.

MINING ENGINEER, TECHNICAL EDU-cation, age 30, desires position; nine years' experience in responsible positions in the West; thorough assayer, surveyor and bookkeeper; references from all former employers. Address E. M., ENGINEERING AND MINING JOURNAL. No. 18,127, Nov. 20.

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.

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. 18,108, Nov. 20.

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.

YOUNG MAN OF GOOD HABITS, ALERT and intelligent, graduate in practical chemistry, desires position in metallurgical laboratory. Address CUPRUM, ENGINEERING AND MINING JOURNAL. No. 18,126, Nov. 6.

WANTED—POSITION AS SUPERINTEND-ent or assistant of chemical works by chemist having several years' practical experience in the manufacture of commercial acids, etc. Address EXECUTIVE, ENGINEERING AND MINING JOURNAL. No. 18,119, Nov. 13.

CHEMIST AND ASSAYER, WITH TECH-nical education, age 27, formerly chemist for a large smelter, desires position with a mining, milling or smelting company; speaks Spanish; best references. Address M. R. K., ENGINEERING AND MINING JOURNAL. No. 18,125, Nov. 27.

EXPERT MINING ENGINEER, ASSOC. M. Inst. C. E., open to appointment. Properties examined or mines managed; 20 years' experience in England, France, Colorado and Mexico; milling gold and silver ores, concentration, lead, copper and coal mining, surveying and assaying. Excellent testimonials and references. Address EXPERT, ENGINEERING AND MINING JOURNAL. No. 18,123, Dec. 4.

YOUNG MINING ENGINEER, GRADUATE of Colorado State School of Mines, first-class assayer and surveyor, desires position. Address H. E. M., 1038 South High street, Denver, Colo. No. 18,129, Nov. 13.

WANTED—POSITION AS SUPERINTEND-ent of coal mines; 25 years' experience. Can furnish gilt edge references; open to engagement at once. Address FORT DODGE, ENGINEERING AND MINING JOURNAL. No. 18,128, Nov. 20.

CONTRACTS OPEN.

A BLACKSMITH, ABLE TO DO ANY-thing, from setting diamonds in a drill to the heaviest forgings; a first-rate man in every respect, steady and reliable, with very highest recommendations, desires employment where there are educational facilities for his children. Apply A1 BLACKSMITH, ENGINEERING AND MINING JOURNAL.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., October 27th, 1897.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 30th day of November, 1897, and opened immediately thereafter, for all the labor and materials required for the completion of the interior finish of the U. S. Post Office, Washington, D. C., in accordance with drawings and specification, copies of which may be had at this office or the office of the Superintendent, at Washington, D. C. 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 Completion of Interior Finish to the U. S. Post Office, Washington, D. C.," and addressed to the Supervising Architect, Orig.

STAND-PIPE.—Proposals, endorsed "Proposals for Steel Stand-pipe," addressed to the Chief Engineer of the Water Department, will be received until 12 o'clock, noon, Monday, November 8th, 1897, at the office of the Chief Engineer of the Water Department, City Hall, Baltimore, Md., for the erection and construction of a steel stand-pipe on foundations to be furnished by the Water Board, on its property in West Arlington, Baltimore, Md. Plans and specifications may be obtained by depositing \$25, or sending check for the same to the Chief Engineer of the Water Department. All proposals must be accompanied by a certified check for one thousand (\$1,000) dollars, made payable to the Water Board of Baltimore City; and successful bidder will be required to give bond in amount equal to one-half the price of the contract. The Water Board reserves the right to reject any or all bids.

ARTESIAN WELL.—Sealed proposals will be received by the City Council of the city of DeKalb, Ill., at the City Hall, until eight o'clock p. m., November 17th, 1897, for boring a deep well. Proposals to be addressed to E. A. Porter, City Clerk, and endorsed "Proposals for Well." A certified check for two hundred (\$200) dollars on a solvent bank doing business in the state of Illinois, made payable to the Mayor of the City of DeKalb, must accompany each bid as a guarantee that bidder will enter into contract and furnish proper bond of \$5,000 within 10 days of award of contract. All bids to be made on blanks furnished by the City Clerk. Specifications, instructions to bidders and forms of proposals can be obtained at the office of the City Clerk. The right is reserved to reject any and all bids.

GRADING.—Office of the Commissioners, D. C., Washington, D. C.—Sealed proposals will be received at this office until 12 m., November 10th, 1897, for grading Baltimore and Twentieth streets and Kenesaw avenue and Park road. All necessary information can be obtained at this office.

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.

WATER WORKS.—Bids will be received by Toms River Water Works, Toms River, N. J., until 5 o'clock p. m., Monday, November 8th, for furnishing materials and constructing a system of water works, comprising the following quantities: 3 1/2 miles of 4 to 8-inch pipe, 36 hydrants, 24 valves, 1 40 H. P. boiler, 1 500,000-gallon compound duplex pump, 1 stand-pipe, or 50,000-gallon tank on tower. Bids will be received for entire work or any part.

STEEL PIPE LINE.—Sealed proposals will be received by the Board of Water Commissioners, at their office in the City of Albany, N. Y., until Tuesday, November 16th, 1897, at 11 o'clock a. m. of that day, for Water Filtration Plant Contract, No. 2, consisting of about 7,950 ft. of 48-in. steel pipe, and appurtenances laid complete. Plans may be seen and specifications, form of proposal, bond and contract obtained, after November 3d, at the office of the Board of Water Commissioners, No. 25 Quackenbush Street, Albany, N. Y., and the office of Allen Hazen, Chief Engineer, No. 57 Lumber District, Albany, N. Y., and St. Paul Building, New York City. Each proposal for said work shall be accompanied by a certified check upon a state or national bank established in the city of Albany, or in the city of New York, for \$5,000 payable to the order of the Chamberlain of the city of Albany. The checks deposited by the unsuccessful bidders will be returned by the Board of Water Commissioners. The amount of the check deposited by the successful bidder will be forfeited in the event that said person shall fail within the time hereinafter set forth to execute the formal contract and deliver the bond hereinafter required. A bond in the sum of \$30,000 will be required to be executed by the contractor with two sufficient sureties, freeholders within this state, or at the option of the Board of Water Commissioners, by an incorporated surety company, duly authorized to execute the same. All proposals for the work must be addressed to the Board of Water Commissioners of Albany, N. Y., and shall have endorsed on envelope "Proposals for Water Filtration Plant, Contract No. 2." The person or persons to whom the work may be awarded will be required to execute the contract with the bond required for the faithful performance thereof above described within ten days of the date of award of contract. Work shall be commenced as soon as practicable after the award of contract, and completed on or before the 15th day of April, 1898. The right is reserved to reject any or all bids.

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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.

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VOL. V.

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CONTRACTS OPEN.

Continued from Page 20.

PUMPING MACHINERY.—Sealed proposals will be received at the office of the Commissioners of Water-Works of the City of Cincinnati, O., until 12 o'clock noon of Tuesday, November 30th, 1897, for the construction, delivery and erection of three self-contained vertical triple-expansion crank-and-fly-wheel pumping engines, each of thirty million (30,000,000) U. S. gals. capacity in 24 hours, and boilers adequate in capacity for the operation of the three engines, in accordance with plans and specifications on file in the office of the Chief Engineer of the Commissioners of Water-Works. The same to be paid for as stipulated in the form of contract for the performance of the above work, and which form of contract is on file in the office of the Commissioners of Water-Works. Copies of the specifications, form of proposal, forms of bonds and form of contract can be procured by application to the Chief Engineer. Proposals must be accompanied by general plans and specifications sufficient to fully and distinctly show and describe the proposed pumping machinery, boilers and their connections, as required by the specifications. Bidders must enclose their bids in sealed envelopes, and deposit the same with the Clerk of the Commissioners of Water-Works, before Tuesday, the 30th day of November, 1897, at 12 o'clock, m., and such sealed envelopes must have endorsed thereon the nature of the bid and the name and address of the bidder. Each bid shall be accompanied with a bond in the sum of \$10,000, signed by two sureties, for acceptance of the contract; if awarded by the Commissioners of Water-Works; or the bidder may deposit with the Commissioners of Water-Works, in lieu of such bond, a certified check or bank certificate of deposit, payable to the order of the Commissioners of Water-Works, or cash equal in amount to the bond as above required. Bidders must furnish satisfactory evidence of their ability to build the class of engines required. Bidders must use the printed forms, as none other will be received. The Commissioners of Water-Works reserve the right to reject any and all bids.

PUMPING MACHINERY.—Sealed proposals will be received by the Mayor and Board of Aldermen of the City of Asheville, N. C. until 3 o'clock p. m., November 12th, 1897, for furnishing and setting up at the pumping station on Swannanoa River, the following described pumping machinery. One (1) Horizontal Triple Expansion, Direct Acting, Duplex, Condensing Engine, capable of delivering one and one-half million (1,500,000) gallons of water in twenty-four (24) hours against a total head of 198 pounds per square inch; and one (1) Boiler of sufficient power to drive the pumping engine at its full capacity. Specifications can be had on application to the City Engineer.

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.

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.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until 2 o'clock p. m., on November 16th, 1897, and opened immediately thereafter, for all the labor and materials required for the boiler plant, steam heating and ventilating apparatus, water supply, filtering and fire protection system, basement floor, etc., for the U. S. Appraisers' Warehouse, New York, N. Y., in accordance with drawings and specifications, copies of which may be had at this office or the office of the Superintendent of said building, at New York City. The right is reserved to reject any or all bids or 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 "Proposals for Boiler Plant, Heating, Water Supply, etc., for the U. S. Appraisers' Warehouse, N. Y.," and addressed to the SUPERVISING ARCHITECT.

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BY

T. A. RICKARD,

Mining Engineer and Metallurgist; Fellow of the Geological Society; Associate of the Royal School of Mines, London; Member of Council American Institute of Mining Engineers; State Geologist of Colorado, etc., etc.

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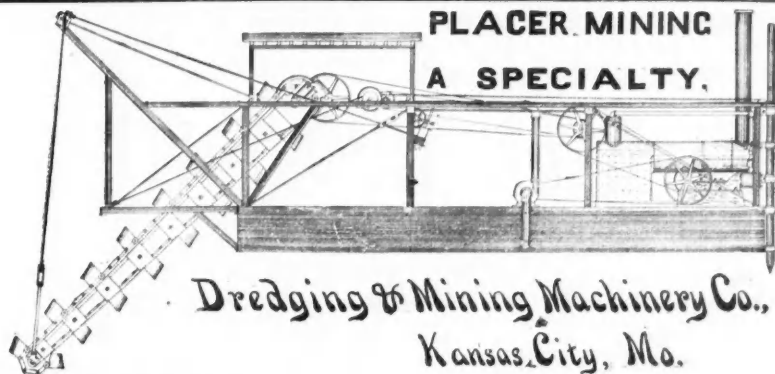
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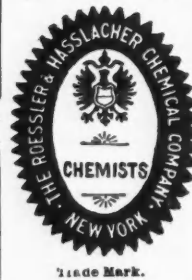
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