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## CONTENTS.

	Page.
MacArthur-Forrest Cyanide Patents in New South Wales.....	595
Institution of Civil Engineers in Great Britain.....	595
Consular Service of the United States.....	595
New Coal Fields in Kent, England.....	595
Technical Instruction and Practice.....	596
The Pennsylvania Coal Investigation.....	596
New Publications.....	597
Books Received.....	597
The Southern States Exploring and Finance Syndicate, Wm. M. Brewer.....	597
Some Mineral Veins of Gunnison County, Colorado.....	597
Gold Mining Convention at Denver.....	J. G. Brown 598
The Canadian Tariff on Mining Machinery.....	598
* Working Frozen Alluvial Deposits in Siberia.....	E. D. Levat 599
Notes on the Bertrand-Theil Open-Hearth Steel Process.....	E. Bertrand 600
"Mineral Soap".....	W. C. Knight 600
The Ruby Mines of Burma.....	T. Trafford Wynne 601
The Strength of Ladders.....	Robert Gilman Brown 602
The Utah Guano Deposit.....	602
Abstracts of Official Reports.....	603
* Douglas' Patent Smelting Furnace.....	604
The Permeability of Steel Melting Crucibles, J. O. Arnold, F. K. Knowles.....	604
Mine and Quarry Statistics of Great Britain.....	605
A Proposed International Testing Laboratory.....	605
Treatment of Ores at Kapnik in Hungary.....	605
Notes: The Wellington Caves, 598—Influence of the Electric Spark on Gases, 599—A Steel Grain Elevator, 599—The British Explosives Order, 602—Basic Steel Production in Germany, 603—Iron Production in Germany, 603—A Test for Carbon Monoxide, 603.	

\* Illustrated.

Personal.....	606	Nevada.....	611	Gold & Silver.....	616	Spokane.....	618
Obituaries.....	606	New Mexico.....	612	Prices, Statistics, Imports and Exports.....	616	London.....	618
Societies and Technical Schools.....	606	Oregon.....	612	Foreign Coins.....	616	Paris.....	619
Industrial Notes.....	607	Pennsylvania.....	612	Copper.....	616	Rossland, B. C.....	619
Trade Catalogues.....	607	South Dakota.....	612	Tin.....	617	Stock Quotations:	
New Patents.....	607	Tennessee.....	612	Lead.....	617	New York.....	620
Machinery and Supplies Wanted.....	608	Utah.....	612	Spelter.....	617	Ind. and Coal.....	620
Mining News:		Virginia.....	613	Antimony.....	617	Philadelphia.....	620
United States:		Washington.....	613	Nickel.....	617	Pittsburg.....	620
Alabama.....	608	West Virginia.....	613	Platinum.....	617	Boston.....	620
Alaska.....	608	Foreign:		Quicksilver.....	617	Baltimore.....	620
Arizona.....	608	Br. Columbia.....	613	Minor Metals.....	617	Cleveland.....	590
Arkansas.....	608	Mexico.....	614	Chemicals and Minerals:		Butte.....	620
California.....	608	New So. Wales.....	614	New York.....	617	Helena.....	620
Colorado.....	608	South Africa.....	614	Liverpool.....	618	San Francisco.....	620
Georgia.....	610	South America.....	614	Meetings.....	619	Denver.....	621
Idaho.....	610	West Australia.....	614	Late News.....	619	Colo. Springs.....	621
Illinois.....	610	Markets:		Assessments.....	622	Salt Lake City.....	621
Indian Territory.....	610	Coal:		Dividends.....	622	Spokane.....	621
Kentucky.....	610	New York.....	614	Mining Stocks:		Rossland, B. C.....	621
Michigan.....	610	Buffalo.....	614	Market Reviews:		Mexico.....	621
Minnesota.....	610	Pittsburg.....	614	New York.....	618	London.....	622
Missouri.....	611	Metals:		Boston.....	618	Paris.....	622
Montana.....	611	Pig Iron Production.....	615	Cleveland.....	618	Valparaiso.....	622
		New York.....	615	Colo. Springs.....	618	Shanghai.....	622
		Buffalo.....	615	San Francisco.....	618	Current Prices:	
		Cleveland.....	615			Minerals, Chemicals, etc.....	624
		Philadelphia.....	615			Advt. Index.....	19
		Pittsburg.....	616			Advt. Rates.....	20

The question of the amendment of the MacArthur-Forrest cyanide patents in New South Wales is still pending. The attempt of the Australian Gold Recovery Company to secure immediate action failed because of the prompt opposition offered by miners and operators interested. The Examiner of Patents, at the instance of these opponents of the patents, has extended until June 26th the time for filing evidence, and arguments will not be heard until after that time. The general opinion locally seems to be that the amendment will not be allowed.

The conference of the Institution of Civil Engineers in Great Britain, which, as we have already noted, was planned and arranged on very much the same lines the meetings of our own technical societies, seems to have been very successful. The attendance at the meeting was large and in the various sections into which the meeting was divided the papers were of a kind to be appreciated and to call out good discussions from the members present. In the mining and metallurgical section there were some interesting papers read, though there were not quite as many members present as in some of the other sections; probably because the meetings of the Iron and Steel Institute and the Federated Association of Mining Engineers had been held only a short time before. Upon the whole the conference was so successful that it is very likely to be repeated next year, and may become a part of the permanent programme of the Institution hereafter.

The improvement of the consular service of the United States is urged upon the President by the Manufacturers' Association of Philadelphia, the members of which have learned, in their efforts to build up an export trade in the last two years, to recognize the value of the service which can be rendered to commerce by a consul who is competent to fill his position. It has too long been the practice to fill these offices for political considerations entirely; and where an able man has received such a position he has too often been removed to make room for a newcomer when he had just learned to understand his field and to appreciate the importance of his duties. This defect in the service is shown by the uneven value of our consular reports, some of which are useful and valuable documents, while too many are of little or no real service. The English reports, on the other hand, are business-like documents, showing the hand of men who are trained to their work and understand what is expected of them. The Philadelphia petitioners ask the President that appointments be limited to competent men; that the more important positions be filled by promotions and transfers; and in general that the service be made permanent as far as possible, and that tenure of office and promotion depend upon good work and merit. These requests seem to be based upon common sense entirely. Some improvement in the service has been made in recent years, but much still remains to be done, and if we are to cultivate our foreign trade, there is no way in which the government can better assist in the work than by sending men abroad to represent it who can understand and appreciate their responsibilities and the service which they can render to commerce.

The opening of a new coalfield in Great Britain is a matter of considerable importance to that country. It might be supposed that the coal measures of that country had been pretty thoroughly explored, and that its resources were fully known, but the discoveries now made show that at least one field of some extent was left. The new workings are in Kent, in the extreme southern part of England, bordering on the Channel, which separates the island from France. Geologists have long asserted the probable existence of coal there, but it is only a short time since actual exploration work was begun. The shafts sunk have now reached a point where the existence of workable coal measures is proved, and it is believed that the new mines will furnish a desirable addition to the coal supply of the country. The nature of the coal and the geological conditions indicate that it is probably a continuation of the seams which are extensively worked in the basin of the Pas-du-Calais, in northern France. In connection with these mines there has been some talk of reviving the iron industry of Sussex, which is of very ancient date, but came to an end long ago when the coal and coke-made iron of the Central and Northern districts took the place of the product of the old charcoal furnaces and forges of the South. It does not appear, however, that the Sussex iron ores are of sufficient importance, as regards either quality or quantity, to warrant anyone in working them on a large scale, or to induce the belief that the district can compete with those now working in Wales and the North. Even the neighborhood of the new coal mines will hardly serve to revive the old industry, which was given up simply because it did not pay to continue it. The Kent coal, however, is nearer London than that of any other district, and that fact will give the mines an advantage in supplying the market of the city, since the question of freights is even more important there than here, owing to the higher rates of freight charged on the English railroads and the greater differences in them due to distance.

### Technical Instruction and Practice.

The question of laboratory practice in technical schools and the extent to which the chemist can be educated in quick practical methods in such schools has recently been discussed by several eminent authorities in the *Engineering and Mining Journal*. The varying opinions expressed as to value of the training given in such schools doubtless have some foundation in fact on both sides, but they are also on both sides somewhat exaggerated. That a "green graduate" put in charge at once of the laboratory of a smelter actively at work would become hopelessly confused seems altogether probable; but it is equally probable that no manager of experience would expect such a graduate to take at once a position in which such varied responsibilities would devolve upon him. Again, arguments have been made for and against the technical school laboratory, and the location of some schools has been criticized in a way which, perhaps, indicates some misapprehension of the facts.

A part of the truth seems to be expressed in the letter of Mr. Sharpless, published in our issue for June 5th. The criticisms on the technical schools have been to a considerable extent based on a misunderstanding of their true purpose. Too much cannot be demanded of a mining school in which the course of instruction is necessarily limited to three or at the most four years, and some of our correspondents seem to forget this fact. In the allied professions we do not expect a "green graduate" to take charge at once of the location of a trunk line of railroad, or to design and build an ocean liner, or to plan an electric plant for a large city. The fact is recognized that years of practical work in a subordinate position will be required before he is able to take charge of important work. The young man who passes through the very thorough course of the United States Naval Academy at Annapolis has to pass further through two year's service at sea before he receives a commission. Why should more be required of a new graduate in mining or metallurgical engineering? It is true that in the course of instruction all possible recognition should be given to practice; but, after all, the office of the school is to teach principles—to ground its student thoroughly in theory and to give him the general knowledge of chemistry and other sciences which he must have if he is to attack successfully the problems which will be presented to him in his later work. The necessary limitations of a school would not permit, as Mr. Sharpless has shown, the presentation of more than a very few of the varied conditions of actual practice, and while the laboratory instruction is useful as far as it goes, it could never take the place of actual experience in serious work.

The truth is that there is, perhaps, as much danger of too much practicalism in school instruction as of too much theory, and there is a further risk in the fact that it is very easy to give the practical side of the training a twist in the wrong direction, so that the graduate may have to unlearn later a good deal that has been taught to him.

In this connection we may also refer to the fact that there is one branch of technical instruction which ought to be cultivated far more than it is, both in the technical colleges and in the schools of the lower rank. We refer to industrial chemistry. Attention has heretofore been called to the extent to which the Germans have already gone in this direction, while the English are following, though slowly. There is no trade in which the industrial chemist cannot find an opportunity for usefulness, and very few which cannot be benefited by his work. Our chemical industries are still limited, because we do not fully realize our advantages and opportunities in this direction. Apart from the manufactures which are usually classed under that head, there are many others in which waste can be utilized in the form of by-products, and improvements can be introduced in methods which it is the chemist's business to study and work out.

This opens questions too important to be properly treated here, however, and their discussion must be postponed to another occasion.

### The Pennsylvania Coal Investigation.

A committee appointed early this year by the Pennsylvania Legislature to investigate the condition of the coal trade in the bituminous coal districts of the western part of the State was for a month or so, this year, engaged in taking the testimony of miners and operators, and this week presented its report. While the investigation seems to have brought out nothing which was not already known to those engaged in the trade, the facts collected have led the committee to take an exceedingly gloomy view of the future. The trade, they say, "is unremunerative to both operators and employees alike, and is gradually becoming more so, resulting in the bankruptcy of the operators, and in the poverty, destitution, distress and in many cases the actual starvation of the miner." While this is, we hope, somewhat overdrawn, the testimony given and, to a certain extent, the actual conditions seem to go far toward justifying it. In such an investigation it is quite probable that both parties would show matters in their worst light; the miners in the hope of securing some legislation

which might better their condition, and the operators to prevent any enactment which might increase their burdens. Making all allowances, however, enough remains to show into what an unfortunate condition the coal trade has fallen.

The inquiry covered the Clearfield, Cambria and Pittsburg districts, and of these three the last named seems to have suffered most. The Clearfield region, which ships chiefly to the tidewater markets, is strongly affected by the competition of the neighboring Cumberland and Broad Top districts, and also by that of the Virginia and West Virginia mines. This has reduced prices to an extent unknown heretofore, and has forced a reduction of wages to a point which will barely permit the miner to live where he has steady work, and leaves him in absolute distress when, as in many cases, he has work only for a part of the time. But there seems to be no prospect of an early improvement. The competition tends to increase as new mines are opened, and it will be impossible to secure the higher prices which are needed to enable the operators to pay better wages. The Pittsburg district is suffering quite as much as its Eastern neighbors. It is not many years since the Pittsburg operators had practically a monopoly of the trade of the Ohio and Mississippi River towns, for which the West Virginia, Kentucky and Alabama mines are now actively competing; and with wages in some of those regions running below 25 cents per ton, it is hard to see where there is an opportunity to raise the rates in districts farther from market. In like manner the Clearfield region must compete with Cumberland, Kanawha, Pocahontas and other coals at tidewater, and its rates are necessarily limited by those of its rivals. Moreover, the supply of labor in the Western Pennsylvania districts is excessive, and a great evil is found in the fact that even at the low rates paid work is not steady, and the earnings of the miner do not represent as a rule much over half time. The result has been a constant succession of strikes and labor troubles, the trade being always in a ferment.

The committee recognizes the condition of the trade and the difficulties attending it, for the report says, "unfortunately for all concerned it is to a great extent the result of economic conditions which no legislature can remedy, avert or overcome, and can only ameliorate to a limited extent." It is no wonder that the condition of the miner is bad; the committee says that "it is one of chronic debt complaint and poverty, and one that enables his employer in most cases to keep him in such condition."

The report makes several recommendations for the amendment of the existing mining laws, none of which, should they be accepted and enacted, would apparently have much effect. The first, after defining exactly the weights of the ton and bushel of coal as 2,000 and 76 pounds, respectively, on which payments are based, requires that the miner should be paid by the weight of run-of-mine coal as sent out in the mine cars and not by the weight of screened coal. While this is partly a response to miners' complaints of cheating in weight by the arrangement and manipulation of the screens, it seems to be partly also an indirect attempt to increase wages. But in this direction it would surely fail, since payment on the basis of run-of-mine instead of screened coal would simply involve a corresponding reduction in the mining rate.

A number of the committee's other recommendations relate to existing provisions of law. Thus they urge amendments to enforce more strictly the law authorizing the appointment of check-weighmen by the miners and the law requiring semi-monthly payments. Some legislation against overcrowding tenement-houses at mines and regulating their sanitary condition is proposed, and seems to be needed. The testimony given before the committee showed an exceedingly bad condition of affairs in this respect at many mines. In addition to the poverty of the miners, many of them are foreigners from Southern Europe, whose standard of living is very low. In many instances, probably, the enforcement of sanitary laws would be resisted by the miners quite as much as by the owners.

The most important recommendation is for the total abolition of the company store, and of all systems of coupons, check-cards and similar devices, so that the payment of the miner must be in money entirely. This will, as similar recommendations have done before, call out a strong opposition. It will, if urged, draw out all the old arguments on both sides, and will doubtless have against it the influence of many, especially the smaller operators, who claim that at the present time the store constitutes their sole source of profit. The company store is probably in some cases an instrument of oppression and a means of defrauding the miner, in others it is a benefit. The question has been so often discussed in Pennsylvania and elsewhere that nothing new can now be advanced on the subject. Upon the whole, cash payments are always the best, and the committee's recommendation seems to have weight. In the anthracite regions the company stores were abolished some time ago.

As we have said above, the report presents nothing especially new. It is a summing up of facts already well known. At this late day in the session it will probably receive little consideration from the legislature, and there is small probability of any action being taken; and it is hard to see how anything really of value could be done.



## NEW PUBLICATIONS.

**HOW TO APPLY FOR A PATENT.** By Henry F. Noyes. New York; published by the author. Pages, 64; illustrated. Price, \$1.

This is a compact and convenient manual for the inventor who wants to secure the protection of a patent for his device. It contains full directions as to applications for patents; how they are to be prepared and presented; what is essential to be done in various cases; and what are the limitations of a patentable device. It gives a full account of the rules of the United States Patent Office, and the forms with which the inventor must comply in preparing and presenting his application, and in meeting any objections which may be raised to granting it. A study of this manual may prevent much waste of time and labor. The main part of the book, which contains the directions for the inventor's use, is followed by an appendix giving a number of practical illustrations of the way in which an application can be carried through various stages. It also gives specifications as prepared, amended and finally approved; while several engravings show how drawings are to be made to meet the requirements of the office.

In fact, we can hardly think of any question in relation to a patent application for which an answer is not to be found here. An inventor should have it at hand, for its clear and pointed directions may save him much time and trouble. Without going too deeply into patent law it shows what rights an applicant may claim, and also what rules he must observe and what mistakes should be avoided to secure a successful issue and so attain his object.

**STATISTICS OF THE AMERICAN IRON AND STEEL TRADE: ANNUAL STATISTICAL REPORT OF THE AMERICAN IRON AND STEEL ASSOCIATION, 1896.** By James M. Swank, General Manager. Philadelphia; the American Iron and Steel Association. Pages 84.

We have frequently referred to the fact that in the United States we have more complete statistics of the iron trade than are accessible in any other country. This is due to the American Iron and Steel Association, and especially to its manager, Mr. Swank's many years of experience in the iron trade, his knowledge of all its branches and his care and thoroughness have enabled him to collect and present the statistics connected with the trade in a very satisfactory way. As usual, the report gives, in addition to the figures for the United States, those for some foreign countries, so that comparisons can be made. In most cases, however, the foreign figures are only brought up to 1895.

The year 1896, while production was below that of 1895, made a much better showing than 1894. It was, however, a year of extremely low prices, in several cases presenting quotations below any previously recorded. It is interesting to trace in Mr. Swank's tables the almost continuous fall of prices. Thus the average price of No. 1 foundry pig in Philadelphia fell in 10 years from \$18.71 to \$12.95, and that of gray forge from \$15.27 to \$10.89; in 15 years the decrease was much greater, from \$25.12 and \$22.94 respectively. The fall in finished iron and steel was even more marked.

Many other interesting comparisons could be made from the report, which presents such abundant material for the purpose. It is a sufficient and creditable record for the iron trade.

## 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 Premier Cypher Telegraphic Code.* Compiled by William H. Hawke. London, England; Effingham Wilson. 1897. Pages, 500. Price, in York, \$3.68.

*Die Glas-Fabrikation.* Bearbeitet von Raimund Gerner. Wein, Pest and Leipzig; A. Hartleben. 1897. Pages, 348; illustrated. Price, in New York, \$1.65.

*Jahrbuch der Kaiserlich-Königlichen Geologischen Reichsanstalt: 1896—XLVI. Band.* Wein, Austria; Published by the Imperial Geological Bureau. Pages, 890; with maps and illustrations.

*Geologic Atlases of the United States: Folio 31—Pyramid Peak, California; Folio 32—Franklin, West Virginia and Virginia. Folio 35—Gadsden, Alabama.* Washington, D. C.; United States Geological Survey 1896.

*Map of Trail Creek Mining Camp, West Kootenay District, B. C.* Compiled from Government Records and Surveys by J. H. McGregor, and drawn by G. D. Curtis. Rossland, B. C.; McGregor, Atkinson & Company. 1897. Scale, 1,500 ft. to an inch.

## 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.

The Southern States Exploring and Finance Syndicate.

Sir: I notice in your issue of May 29th corrections which Mr. Dowlan, manager for the Southern Exploration Syndicate, Limited, suggests should be made to my article on the Villa Rica district in the *Engineering and Mining Journal* of May 1st. I do not care to enter into any controversy on the subject, and the fact that he does not criticise the most important statement I made—that there had been nearly \$50,000 expended, and that 20% of that amount should have been ample to have determined the value of the prospect—seems to me very pertinent, and certainly renders it unnecessary for me to publish any reply. I am willing, though, to abide by the decision of any disinterested engineer of reputation as to whether my article as published does not accurately describe the

underground workings. It was not my intention to give a detailed inventory of every piece of machinery on the property.

BIRMINGHAM, Ala., June 5, 1897.

WM. M. BREWER.

Some Mineral Veins of Gunnison County, Colorado.

Sir: Near the town of Crested Butte, in Gunnison County, Colorado, is a series of veins in the Laramie formation of the cretaceous period which may at some future time become of considerable economic value. These veins are on the south slope of Mount Emmons, in Coon Basin and west of it, and on the north side, in Wolverine and Redwell basins at altitudes varying from 10,000 to over 12,000 ft. The country rock is sandstone and shales, the sandstone, largely predominating, is a light gray, rather fine-grained rock. It usually carries a considerable amount of fine-grained iron pyrites. The shales are usually black, though sometimes greenish, and also carry pyrites, but generally coarser than in the sandstone, and in small cubes about  $\frac{1}{8}$  in. on a face. There are no eruptive rocks found in place here except on Scrap Ridge, where there are a few intrusive sheets or dikes of porphyries, or porphyrite. To the south and west, however, are large intrusive masses and many dikes of the same rock.

The rocks on the south side of the mountain dip to the south toward Coal Creek at angles varying from 12° to 20°. The veins appear to be fault fissures; on the south side they have a northwest-southeast strike, with a few running nearly north and south. On the other side in the two basins, the strike is more northerly, with one or two striking northeasterly. These veins are all large and well defined. Their outcrops are marked by large masses of iron-stained honey-combed quartz, and the mountain sides show great quantities of similar float from the different veins. The best known are the Keystone, on the south side of the mountain, and the Daisy, in Redwell Basin. Both are large, and on both a good deal of work has been done. Whenever the veins have been prospected enough to get through the oxidized croppings, the ores are found usually to be a mixture of galena, blende and pyrite, in varying proportions, with pockets of nearly solid separate minerals. In the Daisy the shipping ore was a carbonate running from 30 to 60% lead and 12 to 18 oz. silver, with some 100 oz. silver per ton. The sulphide mixtures vary in silver from 3 to 30 oz. per ton. From \$2 to \$4 gold per ton is sometimes found. As a rule, the ores carrying most lead have the greatest value in the precious metals.

The Keystone has had more development than any other vein. Its upper level is 670 ft. long, nearly all on the vein, and nearly 400 ft. through ore from which several carloads of heavy galena ore have been shipped. Below is another level which develops over 100 ft. of the vein, which has never shown any signs of pinching out. Owing to the depth of the wash and slide the vein does not crop out on the surface above the workings, but its strike is about N. 25° W. It dips S. W. 55° with great regularity. At present, where the walls can be seen at points opposite each other, sandstone forms one wall and shale the other, and at other points both walls are of the same kind of rock, either shale or sandstone, the vein cutting the formation diagonally. It is in this vein and at the breast of the upper level that the "wall within the vein" occurs, which I described in the *Engineering and Mining Journal* of May 1st, 1897.

For about the first 300 ft. in the upper tunnel the vein showed little or no ore, though there was a mineralized quartz and occasional good assays were had. Then the tunnel entered the first ore shoot, which was 180 or 190 ft. long, then a barren spot about 30 ft. long, and then another shoot, which extended nearly to the breast. No work has been done on the mine for nearly two years. The ore is galena, blende and pyrite in a quartz gangue. Sometimes these minerals are quite intimately mixed, though coarse-grained, and again they run in separate streaks and bunches, so that the ore can be hand-sorted. Taken as a whole, the best and cheapest way of handling the ore would be by concentration. The galena runs from 20 to 30 oz., the blende 6 to 10 oz. and the pyrite 0 to 7 oz. silver per ton, the vein carrying 10 to 20% concentrating ore.

The vein varies from 4 to 7 ft. between walls and sometimes as much as 15 ft., with the ore streak from 1 to 3 ft. wide, though usually there is more or less mineral from one wall to the other. I know of no series of average assays of the vein taken as the tunnel was driven on the ore.

The crosscut, No. 2 East, cut at 25 ft. from the tunnel another vein about 3 ft. wide, carrying minerals of about the same grade as the other. No drifting was done on this vein. The lower tunnel is 80 ft. vertically below the upper; it was first driven 228 ft. as a crosscut, and has been driven 225 ft. on the vein, which is from 4 ft. to 5 ft. wide. Small bunches or pockets of native copper were found, as also in the outer part of the upper tunnel.

Half a mile farther north, in Coon Basin, is the Furniture Boy shaft and cut; this also is on an iron-stained quartz vein, running north and south. This dump, from its red color, is a prominent landmark and easily seen from the town of Crested Butte. In Coon Basin are other similar veins and approximately parallel to the Furniture Boy.

East of Coon Basin is another small basin, which has never had any name, and which shows outcrops of similar veins, but little or no work done.

In Redwell Basin 10 years or more ago considerable work was done, and a quantity of ore was shipped from one property, the Daisy. The workings are a tunnel over 300 ft. long called the Daisy tunnel, and driven on the vein, near the northwest end of the claim, its general course being approximately parallel to the side line, which runs N. 8° 34' W. The first ore found here was largely a yellow clayey ore, carrying a fair percentage of lead and occasionally over 100 oz. silver per ton in car-load lots. After driving about 150 ft. or more the ore changed to a grayish partly crystallized carbonate ore, running from 40 to nearly 60% lead and 14 to 18 oz. silver. From all parts of the mine close on to 500 tons of the ore must have been mined and shipped, as stopes were worked above the tunnel. In the shoots of carbonate ore there occurred masses of mixed sulphide ores, galena, blende and pyrites. This would not pay to ship and was either left standing or thrown back in the stopes as waste. It is of a very similar character to that in the Keystone. The country rocks are here much the same as in the Keystone, sandstone and shale, and the sandstone predominating as on the other side. The vein also dips to the west at about the same angle as the Keystone. About 600 ft. south of the entrance of the Daisy tunnel and a little over 200 ft. higher are the Crested Butte workings. Here is a crosscut 100 ft. long, to the vein

and drifts north and south, aggregating 130 ft. in length. These drifts were driven on a yellowish carbonate ore similar to that found in the outer part of the Daisy tunnel, and like it occasionally running quite high in silver. Stopes were opened overhead and considerable ore shipped. A winze was sunk 65 feet and showed good ore. Besides these drifts, the crosscut was also carried about 50 ft. farther and showed more or less sulphide ore all the way, occasionally in solid masses.

A little south of the Crested Butte crosscut and a couple of hundred feet west are the workings of a group known as the Cardinal Points. The vein, or veins, for there are two, one striking a little east of north and the other a little west of north, are reached by a short crosscut. Here is more sulphide ore. Considerable drifting has been done in rather an aimless fashion, and a winze sunk about 25 or 30 ft. This found some good galena ore running 25 or 30 oz. silver, but the ground was too wet to work by hand, and a crosscut was started about 100 ft. down the hill and giving about that much depth (the hillside is very steep), but has not yet reached the vein.

On the east side of this same ridge, in Wolverine Basin, is what may be called the Wolverine vein. Its strike is north 28° east, and it stands practically vertical. Considerable development has been done on it at various times. It shows the usual sulphide mixture and occasional bunches of copper pyrite. It has been traced nearly 1,500 ft.

The Arctic is a claim just north of the Daisy group, which has shown some high-grade lead ore. Across near the head of the basin is a claim called the Addie. The ore here is different from that heretofore described, being a heavy copper pyrite assaying 15 to 18% copper and 25 to 30 oz. silver, by car lots.

Evidently a great deal of surface oxidation has taken place on some of these veins, as is shown by the character of many of the outcrops and of the float which is profusely distributed over the surface. It is also shown by two deposits of limonite or bog iron ore, one just below the Keystone and locally known as the "Iron Swamp," and the other in Redwell Basin.

The Laramie formation is the coal-bearing formation of Colorado, the coal measures being in the lower part of the formation, and at a depth of from 1,500 to 3,500 ft. below the Keystone workings, while in Redwell Basin there are outcrops of coal a short distance below the Daisy workings, there being no change in the general direction of the dip of the strata as it passes through the ridge of Emmons Mountain, and the coal, rising with the dip is thus brought to the surface.

In many ways this district is well located for mining. Many of the veins are so situated that they can be worked by levels run in on them from the surface, saving much hoisting and pumping. Timber is plenty, with abundance of water for power and milling purposes. The heavy snow-fall in winter is the greatest drawback, but in most cases wire-rope tramways can be built so that shipments can be carried on through the winter.

E. R. WARREN.

COLORADO SPRINGS, COLO., May 10, 1897.

#### THE GOLD-MINING CONVENTION AT DENVER.

Written for the Engineering and Mining Journal by Joseph G. Brown.

The idea of an International Gold-Mining Convention, such as will be held in Denver, on July 7th, 8th and 9th, originated among a few practical men who believe that we are at the beginning of a new era in mining for the precious metals. Hence the plan of this convention was conceived as the initial step in a business campaign of education in all branches of mining. The effort is first made to bring together mining men and investors to discuss such questions as will better acquaint them with the true nature of their reciprocal interests. It will be a special object of the convention to secure such national legislation as will promote the interests of the industry in general and to advocate the creation of a Department of Mines and Mining in the United States Government.

The promoters of this International Gold Mining Convention constitute a temporary association, whose purpose is only to perform the preliminary work of organization and carry out the details of preparation for the reception and entertainment of the delegations. The permanent organization of the convention and of whatever association that may grow out of it will be within the exclusive control of the convention itself. The only circumstance affecting locality is the fact that the project originated in Colorado and that its promotion is in the hands of Denver men.

The plans now being carried out by the Executive Committee in charge cover all details necessary to the purposes of the convention and the committee believes that there will be a large attendance of the substantial mining men of the United States, while representatives of the Mexican, Central and South American republics have also manifested their appreciation of the purposes and possible beneficial results of such a conference. Correspondence from all parts of the country shows an appreciation of the fact that this movement is started at a time when the conditions affecting the mining interests demand conference, education and an opportunity for practical discussion. It is believed that the city of Denver, from its geographical position and neighborhood to various kinds of mines and reduction works is well suited for the meeting.

Though a definite programme will be prepared for guidance in the deliberations, it is not designed that the action of the convention shall be circumscribed by any arbitrary rules or limitations concerning the nature of its discussions. Great latitude is given for the subjects that may come up for discussion and for the measures which may be adopted, though no encouragement is offered to discussion concerning the relative status of gold and silver. The circular of the executive committee calling the convention and setting forth its purposes is sufficiently clear upon this point, expressing the desire that "all papers read and all discussions held be confined to those subjects which are germane to mines, mining and kindred interests. The convention will be in no sense partisan, the originators recognizing the same high patriotism in all Americans, irrespective of political affiliations, believing all to be imbued with an equal loyalty to their country and its best interests."

It is to be a mining convention and its purposes are not limited to the precious metals, but may embrace the entire field of mining enterprise and offer equal representation and opportunity to the miner of iron and coal and the miner of gold and silver. It is now anticipated that the

more interesting and practical part of the proceedings will be the discussions and disposition of the various questions which may arise out of the papers presented, and the measures that will be urged by men engaged in the solution of the problems covering the whole mining field and particular attention will be paid to new methods employed in the economic mining and extraction of the precious metals. Arrangements have been made to enable the delegates to visit and inspect some of the working mines, mills, smelters, mining machinery plants, chemical reduction works and other interesting features of mining operations.

Preparations are also in progress for a fine display of the ores, scientific and commercial minerals and kindred products. For this purpose an invitation for specimen exhibits has been extended to all the mining regions in America, and the responses thus far indicate that there will be an extraordinary collection of minerals suitable to scientific inspection.

As one of the means of formulating a programme that may be acceptable to the delegations, the committee invites suggestions of subjects from which selections will be made for suitable assignment or for presentation to the convention for free discussion. The following suggestions have thus far been received:

- The Demand for a Federal Secretary of Mines and Mining.
  - Federal and State Legislation as Affecting Mines and Mining.
  - Federal and State Statistics of Mines and Mining.
  - Gold Mining a Safe Proposition, Gold Value being Established by Law.
  - The Relation of Gold and Silver in Mining the Precious Metals.
  - Does Gold and Silver Production keep pace with the Increase of Population and the Demands of Commerce?
  - Can Enough Gold be Mined to Safely make it the only Redemption Metal Money?
  - The Opening of Indian Lands that have Mineral Deposits.
  - Mineral Lands and their Development Offer Opportunity.
  - Are the Timber Reservations and Federal Game Preserves Injurious to the Development of Mining?
  - Progress made by Science and Improved Methods of Saving the Precious Metals in the past 25 years.
  - Hydraulic and Placer Mining. Do the Known Area and Gold Deposits of Placers offer Opportunity for Profitable Development?
  - Railroad Transportation and Improvements of Wagon Roads Necessary for the Increase and Development of Mining.
  - The Production and Cost of Gold for 20 Years.
  - The Changes in Processes and Cost of Treating Gold Ores in 20 Years.
  - How Lessening the Expense of Extracting the Gold from Ores Increases Production.
- It may be added that the correspondence of the Executive Committee includes the official representatives of the states and of the nations of the two Americas, and all the leading industrial, commercial and scientific associations of the United States.

#### THE CANADIAN TARIFF ON MINING MACHINERY.

Under the new Canadian tariff, which took effect on May 26th, nearly all kinds of mining machinery are on the free list and exempt from duty. The list of machines which can be imported free is given in the law as follows:

"CLAUSE 535.—MINING, SMELTING AND REDUCING MACHINERY, viz.: Pressure of exhaust fans; rotary pressure blowers; coal-cutting machines (except percussion coal cutters); coal-heading machines; coal augers and rotary coal drills; core drills; miners' safety lamps; coal-washing machinery; coke-making machine; ore drying machinery; ore-roasting machinery; electric or magnetic machines for separating or concentrating iron ores; blast furnace water jackets; converters for metallurgical processes in iron or copper; briquette-making machines; ball grinding machines; copper plates, plated or not; machinery for extraction of precious metals by the chlorination or cyanide processes; monitors, giants and elevators for hydraulic mining; amalgam safes; automatic ore samplers; automatic feeders, jigs, classifiers and separators; retorts; buggies; vanners; mercury pumps; pyrometers; bullion furnaces; amalgam cleaners; gold mining slime tables; blast furnace blowing engines; wrought-iron tubing, butt or lap-welded, threaded or coupled or not, not less than 2½ in. diameter, when imported for use exclusively in mining, smelting, reducing or refining."

The Wellington Caves.—These caves, the earliest discovered in Australia, are remarkable for the large number of fossil remains of extinct animals found in them. The town of Wellington, New South Wales, in the vicinity of which the caves are situated, is on the western line, about 248 miles from Sydney. The caves were discovered in 1830 by Sir Thomas L. Mitchell, the colonial Surveyor-General, while engaged in making explorations for a road to open up the country. The valley in which the caves are situated is bounded on each side by hills of limestone rock, rising to a height of about 100 ft. on the eastern side, and considerably higher on the other. The limestone presents a naked and rugged surface, composed of pointed, weather-worn blocks, between which are small crevices leading to caves and fissures. The Great Cave is approached by a steep and rugged entrance, and consists of a spacious and lofty vaulted chamber, ornamented by an immense stalactite. About 80 ft. to the west of the Great Cave is the Breccia Cave, one of the most important and interesting, from a scientific point of view, yet discovered in Australia. It is a kind of deep pit or well, and from its small size and the difficulty of access is not much frequented by visitors. Gerard Krefft, who for several years was curator of the Sydney Museum, took much interest in the work of exploring the Breccia Cave, and under his superintendence many hundreds of fossil remains were recovered. Curiously enough, no bones of birds have yet been found. The country around Wellington has yet to be systematically explored. When this is done it is probable that further discoveries will be made, not only of fossils, but also of gold, for it was in this neighborhood that McGregor, a shepherd, obtained the auriferous metal long before the finds at Ophir had attracted public attention in New South Wales.



WORKING FROZEN ALLUVIAL DEPOSITS IN SIBERIA.

By E. D. Levat.

In his report on the gold placers of Eastern Siberia, M. Levat says that in the Trans-Baikal the ground below a certain depth is always frozen, and where the gold-bearing deposits extend below that depth it is necessary to adopt special methods of working. Various explanations of this condition of the ground have been offered; the simplest and most natural is found in the intense cold of the climate, the nature of the soil and the short summers, which allow the ground to thaw for only a few feet before the winter returns. In a large part of the region the surface of the earth is very lightly covered with vegetation, and the snow-fall in the Trans-Baikal is also light. It is noticeable that in marshy places, where there is a thick covering of grass or herbage, this deep frost is much less apparent than elsewhere.\*

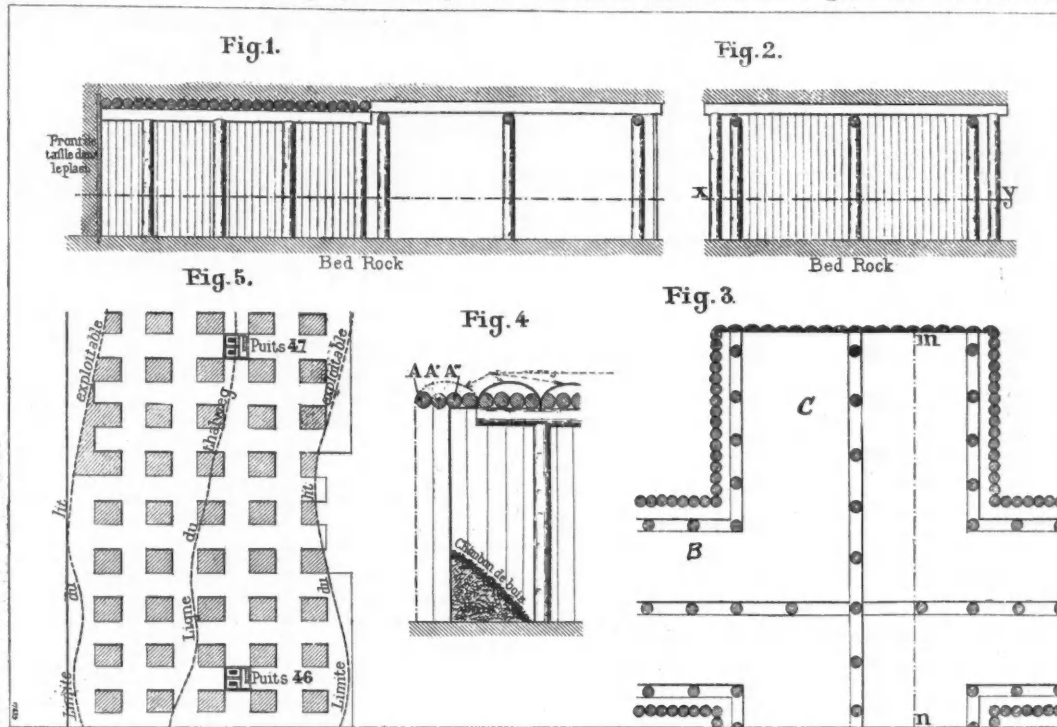
As the working of frozen ground from the surface is often very difficult, it is usually opened by shafts and galleries, as in ordinary deep mining. The methods adopted in Siberia at different points are nearly similar. Workings of this kind are limited by the fact that only rich deposits will bear the expense involved.

An instance of such workings is found in the Malamalski placers, where the lower part of the ground is exploited by means of shafts, of which there are at present five. The gold-bearing deposit in these placers varies in tenor from 1.4 g. to 6.5 g. per ton; its thickness is from 6 to 11 ft., and the depth is about 100 ft. from the surface. The subterranean works were begun, but not very effectually carried out, by the Schounevaloff Company, which preceded the Malamalski Company at these placers.

In placing the timbers it often happens that gaps are left above them in the alluvium, and, aided by the heat of the mine, there sometimes follow slips which will break the strongest timbers. It seems impossible to prevent these, and they are much feared by the miners. In placing the new timbers of the roof, as at A, A', A'', in Fig. 4, they are given a slight inclination upward, which tends to hold them firmly against the old timbering. In underground mining this answers very well, because there is a counter-pressure from the opposite direction. In starting a tunnel into a hillside, however, it is dangerous, as the weight of the superincumbent earth, having nothing to resist it, has a tendency to throw down, or fold up as it were, the whole line of timbering. Such an accident happened at the Iossifoff placer, on the right bank of the Ildikan River.

The usual rule is that each foot in thickness of wood applied to the frozen alluvium will thaw out an equal thickness of gravel. The action, however, will not exceed 35 cm. (14 in.) as a maximum. The method is not an ideal one, but the circumstances are difficult. The frozen soil cannot be worked with the pick, as it does not break, but simply mats together under a blow. For the same reason powder and dynamite have little effect; moreover the drilling of the alluvium through which quartz boulders are scattered is a slow and costly work. The action of the fire seems to be the only method applicable under the existing conditions.

This underground work is carried on only in the winter, when outside work is impossible. In the winter of 1894-95, at the Malamalski placer, in 6½ months working, the total number of working days or men, was 13,770, and of horses 5,276. There were used 2,345 cords of wood and 1,011 cub. m. of charcoal for heating. For lighting there were used 180 kg. of oil and 120 kg. candles. The result was 4,035 metric tons of gravel taken out and washed, from which



WORKING FROZEN ALLUVIUM AT THE MALAMALSKI PLACERS, SIBERIA.

The method of working is shown in the accompanying engravings, which show in Figs. 1 and 2 sections of the galleries, in Fig. 3 a plan of a part of the gallery, in Fig. 5 a general plan of the works and in Fig. 4 a section at the breast of a crosscut. The shafts are sunk about 50 meters apart and are joined by a gallery or crosscut, from which chambers are worked at regular intervals, running to the clearly defined borders of the deposit. Pillars are left 4.3 m. square, the intervals between them being 4.3 m. This arrangement is shown in Fig. 5. The disadvantage is that fully one-fourth of the gold-bearing ore is left in these pillars. They can, however, be taken out when the mine is abandoned, in which case the mine is left to cave in by the weight of the surface soil.

All the workings are very carefully timbered. The walls in most cases are of jointed (tongued and grooved) planks, and the posts used have a minimum diameter of 15 cm. (6 in.) at the small end. In the crosscuts and chambers separate timbers support the roof, as shown in Figs. 1, 2, 3 and 4. This quantity of timber is made necessary by the weight to be sustained from the time the opening is begun until the work is finally left to cave. This lasts usually about three years. The cost of the timbering is the great objection to this method of working.

In working the usual method is to pile up wood at the face of the chamber; then fire it and cover the burning mass with charcoal, the object being to concentrate the fire as much as possible below, the heat having a tendency to rise. As may be supposed, the firing brings up the temperature of the mine; when work is going on at several faces the air is frequently so hot that the miners work entirely without clothes, though the temperature of the air outside is -30° or -35° Cent., equivalent to 22° to 30° below zero in the Fahrenheit scale. When the fire is burned out the face is found to be soft and easily brought down with the pick. The miners then place a new section of timbering, as shown at A, A', A'', Fig. 4, and the operation is repeated.

\*This same phenomenon, of perpetually frozen ground, has recently been reported from the Yukon country in Alaska.—EDITOR E. and M. J.

there was obtained 65.64 kg. gold, or about \$43,600; which seems hardly a paying yield, even at Siberian wages. The average of numerous assays showed that about 80% of the assay value was obtained.

**Influence of the Electric Spark on Gases.**—The property acquired by gases, after being traversed by electric sparks, of cooling heated bodies, as if the gases had become better conductors of heat, has recently been investigated by an Italian, Prof. E. Villari, says the London *Engineer*. The phenomenon was observed by studying the action of different gases on a platinum spiral heated to redness by the electric current, the sparks being produced by a powerful coil reinforced by large Leyden jars. In some cases the apparent cooling produced a fall of resistance of 10%. Under similar conditions the effect was nearly the same for oxygen, nitrogen and air, but much less marked in the case of hydrogen. It increases with the energy of the sparks, and also, at first, with the temperature of the spiral, but after this exceeds a certain limit the refrigerating power decreases.

**A Steel Grain Elevator.**—A new elevator at Buffalo, N. Y., for the Great Northern Company, is to have a storage capacity of 3,000,000 bu., and is to be of steel. The contract has been awarded to Riter & Conley, of Pittsburg, Pa. The grain will be stored in a series of enormous steel tanks, of circular shape, with spherical bottoms and a height of about 70 ft. These will be carried on heavy circular girders resting on steel columns. On top of the tanks will be located the cupola building containing the conveyor, machinery, platforms, distributing tanks, etc. The whole building will cover an area 120 by 400 ft., and the height from the ground to the top of the roof will be 160 ft. The grain will be handled by means of three large movable towers of structural steel, arranged with an elevator system for raising grain from barges into the storage tanks. Between 5,000 and 6,000 tons of plates and shapes will be used in the structure.

## NOTES ON THE BERTRAND-THIEL OPEN-HEARTH STEEL PROCESS.

By E. Bertrand.

In this paper, which was read at the recent meeting of the Iron and Steel Institute in London, Mr. Bertrand says that the process is practically based upon the principle of dividing the work heretofore done in one furnace alone between two, or eventually three furnaces, and of perfectly separating the resulting phosphoric and silicious slags from the metal as it passes from one furnace to the other. The steel works at Kladno have, besides their basic Bessemer plant, a limited basic open-hearth plant, consisting of one furnace of 12 tons and one of 22 to 24 tons' capacity, for the purpose of working up the scrap and crop-ends resulting in the works. The former of these furnaces was erected upon the same level as the gas furnaces for melting or heating the pig iron for the basic Bessemer process, since it was intended to use it as occasion demanded also for this latter purpose. It is therefore situated upon a level of about 15 ft. higher than the larger open-hearth furnace. Experience showed that, when working with a more silicious and phosphoric pig iron, the heats absorbed considerably more time toward the finishing of the heat, owing to the necessity of adding much more lime for the neutralization of the resulting phosphoric and silicious slags, as it took a longer time to free the metal effectually from the phosphorus. The position of the two furnaces upon different levels naturally led to the idea of dividing the work between these two in such a way that the upper furnace should eliminate the main bulk of the silicon and phosphorus, while the lower one should perform the finer work of finishing the metal, which may be done far more effectually and with greater accuracy when the highly silicious and phosphoric slags resulting in the upper furnace are separated from the metal on its way to the lower furnace.

Since a perfect elimination of the phosphorus is not intended in the upper primary furnace, less lime may be added than would be otherwise necessary, and the quantity of slag to be melted therefore materially diminished. The slag covering the metal in a thinner sheet also permits the flame to act with greater intensity upon the metal. The plan of working that was subsequently adopted in this combined way with two furnaces consisted in charging nearly all the silicious and phosphoric pig iron into the primary furnace and nearly all the scrap into the finishing furnace, adding in each such quantities of ore, lime, etc., as the circumstances and experience demanded.

The advantages claimed over the former method of working separately in each furnace were an increase of output and a reduction in the consumption of lime and of basic materials for lining the furnace hearths, since the diminished quantities of slag and their more perfect neutralization naturally reduced the corrosive action of the slags in the furnace. A saving of fuel must also have taken place in proportion to the increased output, but this could not be proved, because all the gas furnaces of the whole plant are fed from the same group of producers. A further material advantage consisted in the possibility of being able to work either with a much higher proportion of pig iron, or even with pig iron alone, or to use as addition to the scrap, pig iron very high in phosphorus, no matter if high or low in silicon, without altering the final result, as long as the pig iron was free from sulphur. Working with more pig iron and ore, a reduction of the loss resulted, owing to the reducing action of the carbon, silicon and phosphorus in the pig iron.

In the autumn of 1896 some work was undertaken at Kladno to answer two questions proposed as follows:

1. May the process be worked to advantage with 100 or nearly 100% of silicious and phosphoric pig iron? and if so, with what results regarding the loss respectively, with what gain of metallic iron from the ore?
2. What proportion of highly phosphoric (basic) pig iron may be worked with good results?

Based upon these questions a number of heats were made, which were all more or less of an experimental nature, owing to the fact that neither furnaces nor men were at that moment prepared for work of this kind.

Following the question of working alone with the phosphoric and silicious pig iron, especially with the intention of utilizing the reductive power of the carbon, phosphorus and silicon contained in the pig iron for an increase of the yield of metal from the iron contained in the ore, a series of experimental heats were subsequently made by charging gray forge pig containing about 3.8% of carbon, 1% of manganese, 1.6% of phosphorus, and 1% of silicon into the primary furnace, adding, besides the lime, larger quantities of magnetic Gellivara ore, with about 65% of iron. The finishing furnace was here actually used only for finishing the heat. It was practically left empty, and charged with a small quantity of scrap merely in order to have something in the furnace when heating it up to receive the heat from the primary furnace, then adding at the proper moment the necessary additions of lime, ore, and finally ferromanganese for finishing the metal. In this case, 12 tons of forge pig iron were charged into the primary furnace. Since the heats boiled up excessively, repeatedly causing large quantities of slag to flow out of the furnace doors, a small quantity of pig iron was replaced by scrap in the subsequent heats, which helped to quiet down the metal. The sample ingot from the primary furnace was taken when the metal was tapped and flowed down into the finishing furnace.

The work done by the primary furnace may be illustrated by comparing the average chemical composition of the pig iron with that of the sample ingots from the primary furnace, as follows:

	C.	P.	Si.	Mn.	Total.
Pig iron.....	3.8	1.6	1.0	1.0	7.4
Ingot from primary furnace.....	2.2	0.4	0.05	0.05	2.7

Hence it follows that the silicon and manganese were practically fully eliminated in the primary furnace, while nearly two-thirds of the carbon and only one-fourth of the phosphorus were left in the metal for finishing in the lower furnace—a fact directly opposed to the results of basic Bessemer practice, where the carbon is oxidized long before the phosphorus. This oxidation of the phosphorus in the primary furnace before the carbon is highly important, since it greatly facilitates the work in the finishing furnace, inasmuch as only so much lime need be added in

the finishing furnace as is necessary to perfectly neutralize the phosphoric anhydride resulting from the rest of the phosphorus, and it is therefore very easy to make the finishing slag highly basic, and thus insure a low percentage of phosphorus in the finished metal. In fact, the whole work in the primary furnace may be regulated by the amount of phosphorus to be left in the metal when tapping it into the finishing furnace.

At Kladno the finishing furnace is unfortunately situated too far from the primary one, so that the runner leading from one furnace to the other is long and of insufficient incline. It is therefore not feasible to run the carbon and phosphorus in the metal down still lower in the primary furnace, because such a metal, if not excessively hot, will not flow down a long runner of insufficient pitch. As regards the temperature of the heat, this to a great extent depends upon the silicon in the pig iron, whose oxidation helps to give the heat the proper temperature. A certain percentage of silicon is therefore favorable for the process, since its oxidation helps to heat the bath to the necessary temperature, and its further acting as a reducing agent upon the ore added, helps to increase the yield of metallic iron.

The paper is accompanied by elaborate tables showing the results obtained in a number of experimental heats, with analyses of the metal. A noticeable point is a variable yield, for which Mr. Bertrand accounts partly by the high percentage of carbon, phosphorus, silicon and manganese oxidized, and partly by the fact that in making these heats it was necessary to leave the finishing furnace empty more than half the time, and then to heat it up when wanted to the proper temperature. This must naturally cause irregularities that may influence the yield more or less. These irregularities would be obviated by using two primary furnaces working alternately into one finishing furnace, so that the latter would be perfectly occupied and kept in regular, uninterrupted operation.

Regarding the time, at the commencement a heat lasted about five hours in the primary furnace, which was decreased to 4½ hours or 4¼ hours as the men got accustomed to the work; in the same way the time in the finishing furnace was gradually decreased to about 2 hours or 2½ hours. These figures show that one finishing furnace will certainly serve for two primary furnaces.

Accepting the time of 4¼ hours for a 12-ton heat in the primary furnace, and taking the time for charging and settling into account, it is seen that two primaries will make at least nine heats in 24 hours. There is reason to believe that with a properly arranged plant, with men once drilled for the work, nine heats of 15 tons may be made in 24 hours. These figures, of course, refer only to the working of silicious and phosphoric pig iron. How much the output may be increased when liquid pig iron coming directly from the blast furnace is charged into the primary furnace still remains to be determined by actual experiment, but material increase of output must result, with a saving of labor for charging.

The analysis of the finished steel, as also the mechanical tests, prove a fair quality. Silicon was not determined in the finished steel, since in the presence of such highly basic slags a more than nominal percentage of silicon is quite out of the question. Sulphur was only determined in the finished steel to prove that no sulphur had been absorbed by the metal in the course of the process, which might be the case when sulphurous ores are used. The sulphur in the pig iron was no higher than 0.05%. The slags from the primary furnace show a high percentage of silica, thereby also proving that practically all the silicon is oxidized in the primary furnace. When working with pig iron still higher in phosphorus, a slag high in phosphoric anhydride, similar to basic converter slag, should result from the primary furnace, that may be used for fertilizing purposes. The great bulk of the slag results from the primary furnace. The slags from the finishing furnace are naturally lower in silica and phosphoric anhydride and higher in lime, so as to insure perfect dephosphorization of the metal. The comparatively low percentage of iron contained in the slags also proves that a large proportion of the iron contained in the ore has been utilized and reduced to metallic iron.

## "MINERAL SOAP."

Written for the Engineering and Mining Journal by W. C. Knight.

Since the year 1888 Mr. Wm. Taylor, of Rock Creek Station, in Albany County, Wyoming, has shipped to various parts of the United States occasional carloads of a peculiar clay, which for convenience may be hereafter known as "Taylorite." The clay bed at Rock Creek is found in the Fort Benton (cretaceous) shale. It is 5 ft. in thickness, and dips to the south from 4° to 6°. The present quarry operated by Mr. Taylor is a quarter of a mile north of the railroad, but at a point further to the eastward the railroad cuts through the bed, which covers an area of several square miles, most of it being overlaid by a considerable thickness of shale. The clay, as taken from the quarry, has a greenish yellow color, but upon exposure to the air it soon assumes a light cream tint. It is easily quarried with a pick, and breaks out in large conchoidal blocks. When taken from the quarry it has an unctuous feeling, and when water is added it forms an emulsion, but only a very slight percentage is soluble in water. Inappropriately this clay has been called "Mineral Soap," on account of its soapy feeling in water. Associated with the clay are thin seams of gypsum and mirabilite (a hydrous sulphate of soda), which are of secondary origin, and may be found in smaller quantities when the clay is quarried from beneath a greater thickness of shale. Although this clay has been shipped long distances and to various points it has been impossible to ascertain for what it has been used. Loading paper and some adulterations have been suggested, but these statements cannot be substantiated. There are, however, many places where this clay could be used provided low railroad rates could be secured.

The production of the Taylor quarry prior to 1896 was 5,400 short tons, valued at \$25 per ton, or \$13,500 in all; in 1896 it was 60 tons at \$5, or \$300 in all, making the total value shipped \$13,800. Mr. Taylor had been receiving \$25 per ton for the clay until 1896, when suddenly the consumers refused to pay more than \$5 per ton f. o. b. Rock Creek. Shipments have been made to New York, Philadelphia, Chicago, Milwaukee, Boston, Denver and San Francisco.



This clay is found over a wide range of territory in Wyoming, and has been reported from Carbon, Albany, Natrona, Weston and Crook counties; but so far as known the deposit at Rock Creek is the only one from which shipments have been made in quantity. The composition of the clay found in various counties varies somewhat, but on the whole it is quite uniform. The table below gives several analyses and partial analyses of Taylorite:

	1. Rock Creek.	2. Crook Co.	3. Weston Co.	4. Natrona Co.
SiO <sub>2</sub> .....	59.78	61.08	63.25	65.24
Al <sub>2</sub> O <sub>3</sub> .....	15.10	17.12	12.62	13.85
Fe <sub>2</sub> O <sub>3</sub> .....	2.40	3.17	3.70	3.12
MgO.....	4.11	1.83	3.70	5.34 + CaO
CaO.....	0.73	2.69	4.12	.....
NaO, KO.....	No est.	0.20 NaO	.....	No est.
SO <sub>3</sub> .....	No est.	0.83	1.53	No est.
H <sub>2</sub> O.....	16.26	.....	.....	9.17
Specific grav....	.....	.....	2.132	.....

The name of the person who analyzed the Rock Creek clay is not known. The Crook County clay was analyzed by Mr. Westfall; the Weston and Natrona County clays by Prof. W. C. Knight.

THE RUBY MINES OF BURMA.

By T. Trafford Wynne.

In this paper, read recently before the Institution of Mining and Metallurgy in London, Mr. Wynne said that the principal ruby-producing district of Burma is the country near Mogok, 90 miles north of Mandalay. Kyatpyin is the present headquarters of the Ruby Mines Company, and the center of the stone-producing tract. A circle with a radius of about 15 miles from Kyatpyin would contain nearly all the mines now being worked.

**Climate.**—The climate is very variable and somewhat trying. The heat is rarely excessive, owing to the height above sea level, 3,700 ft., and in December, January and the beginning of February the thermometer at night sometimes drops as low as 10° Fabr., while in the daytime the sun is very hot. The hottest months are March, April, and part of May, according to the time the rains commence, while in June, July, August and September a fine day is a rare event; October and November are usually fine, but varied by occasional storms. The annual rainfall at Kyatpyin averages between 170 and 180 in.

**Labor.**—The Burman and the Burmese Shan, who are the principal inhabitants of the district, are not good day laborers; they prefer to work on their own account, or for one another, as they then get a share in the profits—when there are any. The best available coolies are the Chinese Shans, called locally "Maingthas," who come from the Chinese frontier. They are short, sturdy fellows who soon learn to use shovel or wheelbarrow, and after a time many become expert drillers. They do not engage singly, but work in gangs under one of their number, who is called a *goung*, and is responsible to the company for a sufficient number of coolies being available every working day, and who draws the pay for the whole gang every five days. The usual rate of pay is 1 rupee per day of 8 to 10 hours, according to season. Engine drivers, blacksmiths, fitters, etc., are usually natives of India. Carpenters are Burmese or Chinese, the latter being first-rate workmen. Pay of artisans varies from 1 R. 8 ans. to 5 Rs. (20 to 75c.)

**Geological.**—The country rock is usually a very hard gneiss, varying to granite, or a soft micaceous schist which disintegrates in the presence of water (of which a large quantity is usually met with), making tunneling difficult and expensive, the timber available being of very inferior quality.

Large hill masses of calc-spar are met with which have evidently been forced by some upheaval through the gneissic formation. These masses, of which the hill called Pingdoug, near Kyatpyin, is the most prominent example, contain fissures and caves usually filled with byon. This byon, in which the rubies are usually found, varies from a somewhat tenacious clay with small, rounded quartz, and other pebbles to a fine gravel almost like river sand. In color it may be from dark red to light yellow. The Burmans have different names for the various kinds, and profess to be able by looking at it to say what is worth washing and what may be rejected; but the writer's experience is that, if the stuff is byon at all, the only reliable test is the washing-pan.

The great bulk of the byon is found as an alluvial deposit in valleys which show the same characteristics, viz., a more or less shallow basin, closed at the lower end by a barrier of hard rock, and with a stream flowing through it. The byon having presumably been brought down by the denudation of the hills above into these basins, the rock barriers have acted as riffles, and while allowing the lighter mud to flow over, have held up the heavier ruby-bearing ground. Those valleys also contain a varying quantity of calc-spar in huge boulders to small pebbles, and the greater the quantity of this the better seems to be the quality of the byon.

Rubies are also found in some places with the calc-spar matrix, but the stones are imperfectly formed and full of flaws, and even if they were of any value, no method of extracting them from the matrix without injury has yet been discovered; hence no attempt is now being made to work these mines.

**Historical.**—It is certain that this stone-tract has been producing rubies for many centuries, since Mogok was well known as a ruby producing district over 500 years ago. The extent of the ancient hill workings, and the fact that in the valleys virgin ground is almost unknown, also leads to the same conclusion.

**Exploitation.**—After the British expedition to the ruby mines, following on the annexation of Upper Burma, negotiations were entered into between the government and various capitalists, with the view to exploit this stone tract, and finally a concession was granted to a syndicate, which afterward transferred it to the present company. One condition of the grant was that natives of the stone tract should be permitted to mine on their own account, on terms to be arranged between the government and

the company. Formerly these terms were, as before the lease was granted, that all stones found should be sold to the company, as representing the government, or a duty of 30% of the price offered must be paid by the miners. This did not work well; regular mining was discouraged while illicit mining and ruby smuggling was rife and very difficult to detect. The present arrangement is that every *twin-goung*, or mine owner, shall take out a license for each man he employs, paying a specified sum (at present 20 Rs.) per man per month to the company for the privilege of working his mine, and he being allowed to sell the stones in the open market to the best advantage.

The Burmese miners have three chief methods of ruby mining: *loos*, or caves; *hmyaws*, or open cuttings; and *twins*, or pits.

**Loos.**—A *loo* is a cave or fissure in the calc-spar rock, and may vary from only a few inches wide to a cave 20 ft. to 30 ft. in diameter. In some cases the entrance is from the side, on a level with the bottom of the cave, but more often it is entered from above. The workmen follow the ramifications of the fissures, enlarging them where they cannot crawl through otherwise, and drag or carry out the byon to the surface in mats or small baskets.

**Hmyaws.**—These are the largest mines, and, though few in number, are very important, since by this system large quantities of inferior byon can be washed at a low cost. A *hmyaw* is a cutting on the side of a hill where byon is found, and to the head of which a stream of water has been brought, often for some miles around the hill sides, by ditches and bamboo aqueducts. A ditch must also be cut at the lowest possible point to act as a tailing race. The ground is cut down by hand, and the water, being allowed to fall upon it from as great a height as possible, disintegrates it and carries it into boarded channels, where it is stirred up with hoes, the heavy byon being caught in a box at the lower end, while the light mud is washed away. The heavy deposit is then washed in small baskets, and the rubies and other valuable stones picked out by hand. These *hmyaws* are usually in the hands of the *Looghis*, or head men of the villages, since considerable initial expenditure, in cutting ditches and making flumes (of bamboo) to convey the water to the mine, is likely to be necessary before any return is possible.

**Twins or Twin Lones.**—These are pits sunk in the alluvial of the valleys, and vary from 2 ft. in diameter to 6 ft. square. The small circular pits are only used where the ground is firm and requires little timbering, and where the quantity of water is but small. In the large twins, or nine-post twins, as they are called, the pit is divided into nine sections, each 2 ft. square, by means of small timbers, so that nine balance poles (one in each section), worked by a corresponding number of men, can be employed. The sides are kept up by small branches, sticks and grass. These twin lones are used where the quantity of water is large and the number of men necessary to remove it is large also. When the twins reach the byon they are carried down in the same manner and of the same size, no attempt being made to do any mining, but when the underlying rock or clay is reached, or the water becomes too much to deal with, the timbers are withdrawn and another twin started as close to the abandoned one as possible.

The byon is put up in a heap until a sufficient quantity to be worth washing is obtained; it is then carried to the nearest mining water, where it is then treated in the same manner as described for the *hmyaws*.

**European Methods.**—After various failures the English company finally decided to sink a pumping pit at the lower end of the Tagoungnandine Valley, and to use available water-power to drive part of the machinery. A 4-ft. Pelton wheel was set at the lower end of the valley, where 100 ft. of effective head of water was available, and the power was transmitted by means of wire ropes to the pumps. A 4-in. centrifugal was found sufficient to drain the excavation to a depth of 50 ft. during the dry weather, a 6-in. being required during the rains.

This experiment being, from a mining point of view, an unqualified success, permission was given to attack the large deposits in the Mogok Valley in a similar manner.

A third valley was opened up in a different manner. In order to save the heavy pumping costs, the valley being quite water-logged and under water for several months in the year, it was decided to drive a tunnel through the rock barrier at the lower end, and so drain the valley to a depth of 40 ft. A tunnel 10 ft. by 10 ft. was driven for a length of 500 ft., the entrance being in a ravine, where a good tip for the spoil, as well as a site for the washing plant, was obtained. The washer erected there is driven by water-power, and the present cost of excavating, hauling, washing, and sorting is only 0.55 Rs. per load of 15 cu. ft. Unfortunately this plan is not feasible at Mogok, at least not for the large valley, as the length of tunnel required would make the cost prohibitive.

All these valley deposits are worked in the same manner. When the ground has been drained, either by pumps or drainage tunnel, the surface soil is stripped off, and tipped to waste, the byon being loaded into trucks, and either run through the tunnel, or wound up an incline and run to the washer. On arrival at the washer, it is tipped on a grizzly to remove all large stones, and is then fed into a revolving trommel, covered with 1 in. square wire mesh, all the byon passing through this mesh going direct to the pans, while what is discharged through the end of the trommel, principally stones and lumps of barren clay, is removed for further treatment. The washing pans used are either of the Whitmore & Binyon or Davy-Paxman type, both giving equally satisfactory results, the quantity passing through each pan before it is necessary to wash out varying from 3,000 to 7,000 cu. ft., according to the nature of the byon, as when much clay is found with the byon, the washing is very much more difficult than when the byon is of a sandy nature.

The concentrated byon left in the pan, about 70 to 80 cu. ft., is run into a locked receptacle, from which it is fed to classifying trommels, in which it is washed in a strong stream of water, to remove all the sand. The different sizes are then picked over by specially selected sorters, and all valuable stones are removed; or it may be the deposit is again treated in a pulsator, which still further reduces the quantity, and then it is passed to the sorters.

In addition to the true ruby, the valuable stones found are sapphires and the spinel ruby; while occasionally tourmaline, rock crystals, and various pretty, but not valuable, stones are found.

**Other Deposits of Rubiferous Ground in Burma.**—Until quite recently

it was believed that the only deposit of importance was that contained in the Mogok tract; that at Sagyin being commercially valueless. A large extent of ruby-bearing ground has, however, lately been discovered in the Chin country, at a place called Nanyaseik, about 60 miles northwest of Mogoung. Information with regard to this stone-tract is at present scarce, the government of India, in pursuance of its usual policy, having discouraged individual enterprise, and no scientific examination has been made. A gentleman connected with the Burma ruby mines has been twice in the district, and from his reports the new tract seems to threaten very serious competition with the Mogok Field.

#### THE STRENGTH OF LADDERS.

Written for the Engineering and Mining Journal by Robert Gilman Brown.

To those who spend a dozen hours a week underground, as well as to the miner with his 10 hours a day, the strength of ladders is of great interest, and on occasion may become supreme. To quiet apprehensions on this score, and to furnish a basis of judgment as well, the following tests were made, and if any excuse for them be called for, on the ground of crudity or incompleteness, it will be amply given if others, with better facilities for such tests, be persuaded to take the question up.

The ladders tested were of the common "Bull" pine of the Sierra region ("black pine" *Pinus Jeffreyi*), the sides of 2 in. x 4 in. rough lumber, fairly clear, and the slats of 1 in. x 4 in. nailed on and not notched in. The width of the ladder and the length of step were 12 in. In such a ladder, when new, the strength of the slats would exceed the resistance of the nails, so that it would fail by the pulling off of the slats. Assuming a vertical position for the ladder, the maximum angle of a man's arm in climbing would be included by 45° out from the vertical, which would also represent the maximum tendency toward pulling off to which the slats would be subjected. In accordance with these premises, the tests were made by placing the ladder at an angle of 45° against a support, with the slats on the lower side, and weighting the slats to the point of rupture or detachment by means of steelyards. The results are shown in the table.

TABLE OF LADDER TESTS.

Ladder.	Age, years.	Cond of wood.	Nails, 12-penny.	No. of tests.	Weight of cubic feet of wood.	Pull			REMARKS
						Max. lbs.	Min. lbs.	Avg. lbs.	
A	New	Green	Wire	3	24.6	886	669	725	Slats all pulled.
B			Cut	3	24.6	1,524	1,075	1,324	
E	1/2	Very wet	Wire	6	23.2	922	612	759	3 slats broke with warning. 1 slat without warning. 2 slats pulled with warning. 3 broke " "
C	1	Wet	Cut	5	22.6	1,101	811	979	
D	1	Damp	"	7	23.1	1,188	356	721	5 slats broke without warning. 1 slat pulled with warning. 1 side broke " "
G	1	Very dry	Wire	6	25.3	464	226	310	
F	5	Dry	Cut	2	21.7	665	403	534	All pulled " " from 2 to 30 seconds. 1 slat broke without warning. 1 " with slight warning.
F	3	"	"	3	21.7	1,227	709	987	
G	1	Very dry	Wire	4	25.3	1,345	1,082	1,246	Made on three-year-old slats on same ladder. 1 slat pulled without warning. 1 " broke " " 1 " with " " Made on slats pulled from G. All broke without warning.

Before proceeding to discuss the general strength of ladders as brought out, it will be found interesting to compare tests A and B, made on ladders of identical condition, save in the kind of nails used. The relative resistances of the two kinds, wire and cut, was found to be practically in the proportion of their respective adhering surfaces. Twelve-penny wire nails, 75 to the pound, present an adhering surface of 0.785 sq. in. each, the point being ignored and 1 in. being subtracted from the length to allow for the thickness of the slat. Twelve-penny cut nails, 47 to the pound, with the same allowance present 1.394 sq. in. each. Their relative resistances are 725 and 1,324 lbs. for 6 nails, or 121 and 221 lbs. per nail, which reduces to 154 lbs. per sq. in. of adhering surface for wire, and 159 for cut nails.

In studying the table, the column of "Minimum Pull" is the one to which the most interest attaches, and in that the smallest value is 226 lbs., corresponding also to the smallest average of 310 lbs. The descriptive data for this test, G, are "one year in use in very dry place" and "nailed with wire nails." These would seem to be the ear-marks of the poorest ladder. Referring to the last test in the table, it will be seen that the wood was sound, but brittle from its dryness. The failure of this ladder was due to the shrinking or drawing away of the wood from around the nails. Shrinking produces also the same appearance, and to a certain degree the same effect, as if the nails had started from their places; the shrinking of the slat is toward the nail head, which is grasped by the wood, and that of the sides is away from the slat against the resistance of the nail point. And this gives an obvious means of diagnosing this malady of extreme dryness, and one that can be applied instantly to any ladder.

But the case is different for ladder D, probably the most dangerous, if not the weakest one of the lot. A minimum pull of 356 lbs., and five slats breaking with no warning, make a very dangerous combination. Casual scrutiny, such as one would naturally give to his surroundings on ascending an unfamiliar ladder-way would reveal the weakness of G, but not of D.

From general appearance F would have been classed as the weakest

ladder of the lot, so that its record is surprising, and it is quite worth bearing in mind that prolonged dryness is not the worst condition for timber. Returning to a further consideration of D and G, we should also note that taking into account the foot pressure, G is probably as strong as any in the list. In an average man the chord of his arm, bent in climbing, measures 20 in. from center of shoulder to palm of hand, and 60 in. is the distance from center of shoulder to ball of foot. With the foot placed 72 in. below the hand, the pull of the hand is  $\frac{2}{3}$  of his whole weight, and the thrust of the foot  $\frac{1}{3}$  of it. With an assumed weight of 200 lbs., the pull and thrust are 55 and 166 lbs., respectively. On this basis G presents, as factors of safety, 4 for pull and 6 for thrust. D, on the other hand, presents 6 for pull and 2 for thrust, with the additional danger of no warning before rupture. When we come to inclined ladders, the danger of pulling off becomes less, and G drops from the dangerous list.

The points that stand out from the foregoing are three: The weaker ladder is the very dry one; the most dangerous ladder is the damp one; the strongest ladder is the new one put together with cut nails. As a whole, the study is reassuring, and goes to account for the infrequency of accidents from the failure of ladders. As a corollary the following may be suggested: For dry places use dry lumber and notch the slats in flush; for damp places make heavier slats.

#### THE UTAH GUANO DEPOSIT.

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

A unique mining venture—the economic working of the only deposits of the kind north of the Equator—will soon be in progress on Great Salt Lake in Utah. Guano was discovered on Gunnison Island, in Box Elder County, Utah, in the winter of 1894-95 by A. Richter, George Payne and T. G. Davis. Immediately on learning the value of their find they prospected all the islands and the shore line of the lake, desiring to have a monopoly of this product, if possible. Under legal advice they located twelve placer mining claims of 20 acres each; eight on Gunnison, two on Hat and two on Davis Island, respectively, and these 240 acres embrace all the deposits of this valuable substance.

So soon as it became noised about a party of jumpers filed a desert land entry on the Gunnison 160 acres and shortly afterward the Southern Pacific Company set up a claim to the better part of the beds, alleging that the ground was within 20 miles of its track, hence in the limits of its land grant. Last winter a homestead entry was made on the Gunnison tract, which rounds out the list of claimants. The placer locators were poor men, but alert, and they succeeded in securing associates of means and enterprise to join with them and aid in protecting their rights. Within a few months of the first discovery the Utah Guano Company was incorporated with \$90,000 capital stock, in shares of \$1; the present officers being: Simon Bamberger, president; A. H. Cannon, vice-president; T. A. Perkins, secretary; W. S. McCormick, treasurer; A. Richter, general manager; these with John Beck and W. C. Maginnis compose the directorate.

The railroad has now abandoned its claims to title of the land, and in the district court at Ogden, on May 3d, 1897, an order was entered making the temporary injunction, obtained by the Guano Company against the desert land filers, perpetual. At this hearing it was proven that these tracts are not farming land, hence there is no way in which title can be had to these deposits save as placers.

The all-important matter of title being thus settled the Guano Company speedily made preparations to mine its placer deposits and to begin marketing its products this season. A contract was at once let for the building a three-masted schooner, 400 tons burden, adapted for navigating this treacherous sea, to cost \$5,000, and to be launched early in July. A contract is practically closed for 6,000 tons for beet-sugar lands in California, which will compose the initial shipments.

Guanos are rated according to their nitrogenous and phosphatic contents. From parts of Chile, Peru and the islands near by, where there is almost no rainfall, come the best of these fertilizers. Around Salt Lake there is considerable rain, and a larger portion of these soluble salts is leached out. Analyses show the Utah guano has about half the percentage of the soluble ingredients contained in the standard high-grade Peruvian, but the Utah product is said to be still worth \$40 to \$45 a ton in San Francisco. In thickness these deposits vary from 1 to 20 ft., and a recent estimate of the material in sight, after a very thorough examination, places the total at over 1,000,000 tons.

The origin of these deposits is similar to that of the Peruvian guano. Millions of gulls, pelicans, grebes and blue cranes have chosen these tracts for their nesting place. At times, they cover the surface so that not a point can be seen, save a broad carpet of live feathers, and when they rise on the wing they hide the sun completely. To-day it is impossible to step anywhere on the ground of the company without walking on eggs. Gulls' eggs are as large as hens' eggs, which they resemble in taste and flavor, while those of the other feathered denizens of these islands are not fit to eat. The pelicans destroy large quantities of fish from the streams that flow into the lake. In Great Salt Lake there are no fish, or anything else in the way of animal or vegetable life, with the single exception of a sort of a diminutive shrimp, colloqually styled the "Salt Lake Shrimp."

The British Explosives Order.—The Secretary of State having taken into consideration the various representations which have been made to him on the subject of the Explosives in Coal Mines Order 1896, has decided that he may properly postpone till January 1st, 1898, the date at which the order shall come into operation, except as regards article 3, which will come into force on July 1st next. Article 3 reads as follows: In every coal mine on and after July 1st, 1897, the use of any explosive is prohibited in the main haulage roads and in the main intakes unless the following condition is observed: That all the workmen have been removed from the seam in which the shot is to be fired, and from all seams communicating with the shaft on the same level, except the men engaged in firing the shot, and such other persons, not exceeding 10 in number, as are necessarily employed in attending to the ventilating furnaces, steam boilers, engines, machinery, winding apparatus, signals or horses, or in inspecting the mine.



ABSTRACTS OF OFFICIAL REPORTS.

Great Boulder Proprietary Gold Mines, Western Australia.

The report of this company for the year 1896 shows that the receipts from the mine were £223,705, and the expenses £46,777, leaving a balance of £176,928. Adding transfer fees, £395, and subtracting £9,781 for London expenses, a balance of £167,542 remained, from which dividends to the amount of £160,000 were paid, being 100% on the stock. There were in all 16,729 tons of ore from the mine treated during the year, and 55,949 oz. gold obtained. At the value given this was equal to 52,592 fine oz., or 3.14 oz. per ton worked.

The average return per ton worked was therefore \$65.07; while the expenses reported were: Mine, \$5.25; mill, \$5.27; general, \$3.11; total \$13.63 per ton. This leaves a profit of \$51.44 per ton worked.

During the year 5,616 ft. development work were done, and the manager reports 49,653 tons of ore opened up and in sight. Experiments are being made on the treatment of the tailings, the assays showing sufficient value in them to warrant it, if it can be done at a reasonable cost. Sufficient water is now obtained from the mine shafts for all necessary purposes of the mine and mill.

Nundydroog Company, India.

This company's report covers the operations of its mines in the Colar gold-field for the year ending December 31st, 1896. The total income for the year was £168,167 from gold sold and £714 for interest, etc., making £168,881 in all. The expenditures were £74,694, leaving a net profit of £94,187. From this dividends were paid amounting to £71,500, or 32.5% on the stock.

During the year 39,490 tons of ore were crushed and 7,990 tons of tailings treated. The result was the production of gold as follows: From mill, 43,299 oz.; from tailings, 1,626 oz.; total, 44,925 oz. This was equal to 39,594 fine oz. gold, or 1 oz. per ton crushed. The average return per ton was \$20.72. The expenses were: Administration, \$0.44; mine costs, \$5.30; mill costs, \$1.17; working tailings, \$0.34; transportation, insurance and general expenses, \$0.92; royalty to Mysore government, \$0.21; total \$9.19. This left an average profit of \$11.53 per ton worked.

A new battery of 30 stamps was put up. The old mill of 40 stamps is being rebuilt, and the company will then have 70 stamps available. A cyanide plant with a capacity of 2,500 tons per month is being put up at the mine. The development work done during the year was 7,613 ft. driving, sinking and raising, while 2,092 cubic fathoms of ground were stopped. The ore reserves at the close of the year were estimated at about 60,000 tons or over, 8,000 tons more than at the beginning of the year.

The company employed 2,205 persons, of whom 34 were Europeans, 38 Eurasians and 2,133 natives; of the latter 1,245 worked underground.

Robinson Gold Mining Company, Transvaal.

The report of this company covers the year ending December 31st, 1896. The total receipts of the year were: From gold obtained, £778,082; rents, interest, etc., £6,117; total, £784,199. The expenses were: Mining, £110,748; milling, £32,788; maintenance, £4,387; salaries and general expenses, £20,045; mine development, £37,092; plant and buildings, £28,008; cyanide and chlorination works, £154,903; total, £387,970, leaving a profit of £396,229 for the year. From this is to be deducted £19,825 for depreciation and miscellaneous charges and £330,000 dividends paid, leaving a balance of £46,404. Adding a balance of £321,325 carried over from 1895, there was a surplus of £367,729 to current year.

Details of working for the year show that 177,500 tons of ore were mined and passed through the mill. Of this ore 40.3% came from the South Reef, 44.2% from the Main Reef Leader and 15.5% from the Main Reef. The tailings and concentrates saved were 99,905 tons, or 56.5% of the tonnage milled. From the tailings 73.8% of the assay value was saved, a rate nearly 10% higher than in 1895. The output is given as follows, the averages being reduced to United States coin:

	Total Ounces.	Per ton	
		Ounces.	Value.
Gold from mill .....	129,627	0.73	\$12.77
" " concentrates .....	10,655	0.06	1.19
" " tailings .....	30,986	0.17	2.80
Total .....	171,268	0.96	\$16.76
Total, fine gold .....	144,721	0.81	\$16.76

The concentrates are treated by chlorination and the tailings by cyanide. The cost of treating the tailings was reported at 71c. per ton cyanided. The work in the mill was somewhat delayed during the year by difficulty in obtaining and holding native labor. The working expenses on the basis of the total tons milled have been for two years, per ton:

	1895.	1896.
Mining and mine maintenance .....	\$3.05	\$2.99
Milling and mill maintenance .....	0.92	0.89
General maintenance .....	0.69	0.12
General charges .....	0.52	0.54
Cyanide expenses .....	0.36	0.40
Mine development .....	1.37	1.00
Plant and buildings .....	0.15	0.76
Total .....	\$6.46	\$6.70

The net profit last year was therefore \$10.06 per ton. To put it in another form, the working expenses of the Robinson were 40% of the gross receipts. The cost of producing an ounce of gold was \$8.27.

Development work during the year included 655 ft. shafts sunk; 11,193 ft. drifts, raises and crosscuts. This work was sufficient to keep well ahead of demands, the estimated tonnage of ore in sight at the close of the year being 441,500 tons, an increase of 53,000 tons over that reported at the end of 1895.

In the chlorination works two new roasting furnaces were completed and the vat capacity increased. A number of improvements were made in the cyanide plant, and new pumps and other machinery were put in.

Regarding the treatment of slimes, the report says: "The initial start with the treatment of slimes was made at these works about the middle of November, 1895, but no return was made until the end of January,

1896. Up to the close of the year 75,814 tons have been dealt with, for which the company received £11,769, plus £3,303 for its half share of the profits made in working. This department, in common with the other works, has suffered great inconvenience during the year through the scarcity of native labor, and has also had to contend with many difficulties in raising the product from the dams, and delivering it at the works. The original plant was designed to treat sands and slimes in about equal proportions; but in actual working it was found that the percentage of sands was so small as to render it inadvisable to treat this product separately. Half of the plant had therefore to be altered and adapted to the treatment of slimes. Owing to the above causes the quantity handled has been some 20,000 tons less than was expected. The expense of converting the sands portion of the plant has been charged to revenue account, and this, to some extent, explains the high cost of treatment, which has amounted, up to November 30th last, to \$2.35 per ton, inclusive of royalty, which is 3% of the gold won."

Flagstaff Company, Limited.

This company owns a property in Utah, and has recently purchased some mining property in Western Australia which it is now developing. The report for 1896 says of the Utah mine that, in view of the continued low price of silver, and the desire of the board to curtail expenditure as much as possible, very little work has been done since the last meeting; this, however, has resulted in opening up bodies of ore in two levels, and Mr. Stilwell, who is in charge of the property, reports very favorably on present prospects; a little work has also been done by some parties in view of taking a lease or purchasing the property, with the result that ore to the value of \$430 was obtained, and there is no reason to doubt that more systematic work would show good results. Some propositions have been made to the directors with regard to a sale of this property, but as yet nothing definite has resulted.

Of the property in Western Australia the report says: "The main (Ethel) shaft is now sunk to a depth of 160 ft., at which point a crosscut 29 ft. long has been made, intersecting the main lode, which is fully 9 ft. wide. From this point of intersection a level has been driven a distance of 12 ft. and assays give an average of 2.85 oz. gold per ton. A crosscut has also been made from this shaft at a depth of 100 ft. where the lode is about 4 ft. wide and shows free gold all through, and a level is now being driven along the lode. Two other shafts are now down to a depth of 60 ft. and a level driven connecting the three shafts, opening up the lode for the whole distance. The continuation of the Perseverance lode has also been intersected by a crosscut at 138 ft. from the 60 ft. level, and the manager reports that the lode is 8 1/2 ft. wide, showing good ore.

"It has been the desire of the board, so soon as a sufficient quantity of ore was opened up, to take steps for the erection of machinery for treating it, but in consequence of the scarcity of water, expensive freight and conflicting opinions as to what machinery was most suitable, they have never been in a position to do so."

**Basic Steel Production in Germany.**—The returns just issued by the German Iron and Steel Association show the great development of the basic steel industry in Germany. The returns state that the output of Thomas steel amounted last year to no less than 4,297,447 metric tons, as against 3,539,203 tons in 1895 and only 3,241,272 tons in 1894.

**Iron Production in Germany.**—The output of pig iron in Germany in the month of April was 140,823 metric tons, being 90 tons less than in March and 3,002 tons less than in April, 1896. For the four months ending April 30th the production this year was: Foundry iron, 345,512 tons; forge iron, 547,913 tons; Bessemer pig, 179,887 tons; Thomas (basic) pig, 1,146,587 tons; total, 2,219,899 tons, showing an increase of 183,417 tons, or 9.1% over the corresponding period of last year.

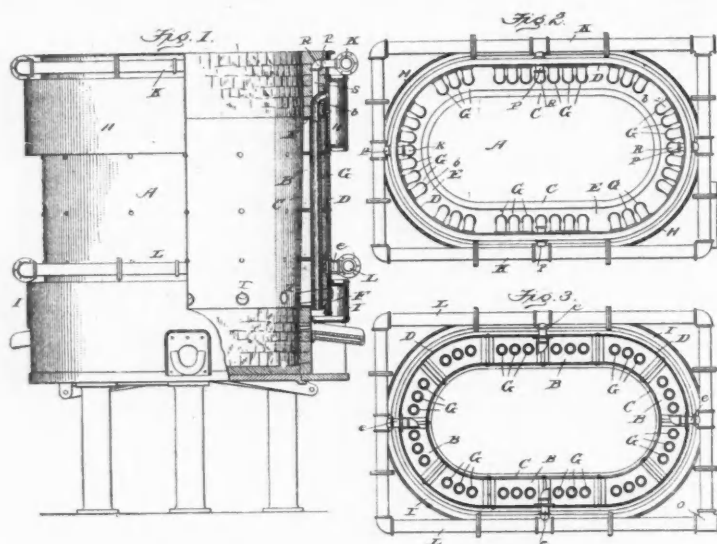
**A Test for Carbon Monoxide.**—For detecting this poisonous gas in the air of mines, M. A. Mermet, a French authority, finds a dilute solution of potassium permanganate, containing a little nitric acid, highly efficient, the effect being to decolorize the permanganate solution. The reaction goes on more rapidly when the solution also contains silver nitrate, one part of carbonic oxide per 500 to 5,000 parts of air decolorizing the liquid in from 1 to 24 hours. The reagent is prepared as follows:—Silver nitrate solution: two or three grammes of silver nitrate crystals dissolved in one liter of water. Potassium permanganate solution: one liter of distilled water boiled with a few drops of pure nitric acid (free from hydrochloric acid), a little permanganate solution being added until the liquid becomes rose-colored, in order to destroy any organic matter which may have found its way into the water, as dust, etc. When cold, one gramme of potassium permanganate crystals is dissolved in the water, and 50 c. c. of nitric acid are added thereto. For use, 20 c. c. of silver nitrate solution, 1 c. c. of the permanganate solution, and 1 c. c. of pure nitric acid are mixed together and made up to 50 c. c. with distilled water freed from organic matter. The reagent must be used immediately. To collect a sample of air from the gallery of a mine, a flask is filled with pure distilled water and emptied in the gallery, the air entering the flask by displacement. When the air is dusty the flask should be fitted with a paraffined cork with two tubes, one for the outflow of the water, and the other filled with cotton-wool to filter the ingoing air. The bottle must then be closed by a glass stopper, since the organic matter in the cork would decolorize the reagent and spoil the test. A second flask being filled with normal air, some of the reagent is poured into both, and they are then placed side by side on a sheet of white paper. After some time the impure air will decolorize the liquid, whereas that in the flask of normal air will retain its original rose color. This decoloration is more rapidly effected in proportion as the quantity of reducing gas is greater. The actual nature of the impurity can then be ascertained by ordinary methods, but sulphur, if present, reveals itself during the initial reaction by combining with the silver salt to form sulphide, which turns the reagent brown.

## DOUGLAS' PATENT SMELTING FURNACE.

The accompanying illustration shows an improved form of smelting furnace, recently patented by Mr. James Douglas, of New York. The drawings show one form of the furnace, but this can be readily modified to suit different cases. In the drawings Fig. 1 is a side elevation, partly in section, of this improved smelting furnace. Fig. 2 is a plan view with the top bricks removed. Fig. 3 is a horizontal section above the tuyeres. *A* represents the body of the furnace, consisting of the inner and outer shells *C* and *D*, separated by the staybolts *aa* to form the usual water-jacket space *B*. *H* represents the upper wind-box surrounding the upper ends of the water-jacket space *B*, and this wind-box *H* communicates with an annular series of vertical pipes *G G* by means of the elbows *bb*. The pipes *G G* extend downward the entire length of the water-jacket space *B*, through its bottom *F*, and communicate with the interior of a second lower wind-box *I*, from which the blast passes inwardly through the tuyeres *T* into the furnace. *K* represents the water inlet pipe, which receives its supply through the coupling *N*, the water passing through pipe *K* and through the branch pipes *P P*, elbows *R R*, and vertical pipes *S S* to the water-jacket space *B*, which it completely fills, thereby surrounding the vertical air blast pipes *G G*.

A pipe *L* extends completely around the outside of the lower ends of the water-jacket space *B* and communicates therewith by a series of short branch pipes *e e*, by means of which the water is drawn from the water-jacket space *B* and discharged through outlet connection *O*.

From the above description it will be seen that the temperature of the



DOUGLAS' IMPROVED SMELTING FURNACE.

water in the water-jacket space is considerably lowered by the cold-air blast passing through the series of blast-pipes *G*, extending through the entire length of the water-jacket space. At the same time the heat abstracted from the water is utilized to raise the temperature of the air-blast, in which condition it is conveyed through the lower wind-box *I* and tuyeres *T* to the interior of the furnace, whereby the benefits of a hot blast are received.

**Egyptian Bronze.**—The composition of some ancient Egyptian bronze and iron implements formed the subject of a paper read recently before the Manchester Literary and Philosophical Society by Dr. A. Harden. The author communicated the results of the analysis of two ancient iron chisels found in Thebes, and dating from about 600 B. C. Both of the implements contain a very small amount of carbon, and could not be rendered very hard by tempering. A specimen of bronze, dating from about 1500 B. C., was found to resemble modern bronze in its composition, consisting of copper alloyed with tin.

**Effect of Temperature Upon the Magnetic and Electric Properties of Iron.**—This was the title of a paper by Mr. D. K. Morris, of Zurich, read lately before the Physical Society, says the London *Engineer*. The investigation relates to the measurement of the magnetic permeability, hysteresis and electrical resistance of iron simultaneously at different temperatures. The specimens are formed into annular rings made from iron strip. The strip is first lapped round with asbestos, paper and mica, and then wound upon itself to the required thickness. A platinum wire is included in the mica lappings for thermometrical purposes. Upon each annular ring are the following windings: 1. A primary magnetizing coil; 2, a secondary coil connected to a ballistic galvanometer; 3, an electrical heating coil. Further, the iron strip is itself connected to a Wheatstone's bridge for resistance measurements. The coil can be heated to 1,050° C. At the higher temperatures the surrounding air has to be freed from oxygen; this is done by enclosing the coil in a suitable vessel and exhausting with an air pump; when most of the air has thus been removed, the residual oxygen is absorbed by an electrically heated iron wire. Curves are drawn representing the changes of permeability at the different temperatures, and at the same temperatures the corresponding hysteresis loops are plotted. The hysteresis diminishes with temperature and nearly vanishes at about 764° C.

## THE PERMEABILITY OF STEEL MELTING CRUCIBLES.

By J. O. Arnold and F. K. Knowles.

In this paper, read before the Iron and Steel Institute at its recent meeting, Messrs. Arnold and Knowles give the result of a number of experiments made under their direction, in which from 1 to 4% of metallic aluminum was added to the iron in the crucible. The metal used was Swedish. Analyses of the ingots before and after melting show that in each case the greater part of the aluminum has been oxidized, and that the carbon liberated has converted the iron into hard steel in one case (No. 4) remarkably high in silicon, doubtless reduced from the clay of the crucible during the prolonged time the steel was maintained in a molten state.

The most important practical feature of the experiments is the fact that the walls of a crucible form little protection against the absorption of sulphur by the metal inside it. On melting the original alloy the sulphur doubled (0.01 to 0.02%); on the second melting it rose to 0.03%, while with a very bad coke (containing about 2% S) it has risen to 0.06%. In other words, an analyst would deny that it was melted from good Swedish material. It is a curious fact that during the melting of an ordinary ingot, sulphur was kept burning under the furnace bars, and no unusual increase was detected in the sulphur of the ingot. A feature worthy of notice will be found in the phosphorus. The authors satisfied themselves that the minute decrease noted is not due to errors of analysis, but to the basic action of the alumina. The latter is very large in volume, and occurs partly in loose pieces on the surface of the molten steel, but mainly in



FIG. 1.

the form of a second inner crucible, as shown in Fig. 1, where *A* is the steel, *B* the self-formed crucible of alumina, *C* the clay wall of the original crucible. The results obtained in the cases described will convey to makers of high-class crucible steels working to stringent chemical specifications a clear idea of the importance of insisting upon the sulphur in their coke being reduced to the lowest possible percentage, otherwise the purest Swedish bar irons may melt out seriously high in this objectionable element, owing to the crucible being permeated by the sulphur dioxide ( $SO_2$ ) present in the furnace gases in considerable quantity when impure coke is employed in melting the charge.

**Loss of Life in German Collieries.**—According to *Kuhlows*, the official statistics show that in 1896 in the collieries of the Breslau District, which afforded employment to 75,073 miners, the fatal accidents were as follows: In blasting, 8; falls of roof and sides, 59; on inclines, 10; in shafts, 14; in haulage roads, 3; by firedamp, 4; noxious gases, 110; by inbursts of water, 2; at surface, 19; other accidents, 19; total lives lost, 248. The number of accidents with fatal results amounted to 138, of 1.84 per 1,000 miners employed. The lives lost were 3.30 per 1,000 miners employed, or 1 out of 302.7 men.

**Liquefaction of Fluorine Gas.**—At a recent meeting of the Académie des Sciences in Paris, M. Henri Moissan communicated the results of his experiments with Professor Dewar in the liquefaction of fluorine gas, which has hitherto resisted all efforts to reduce it to a liquid state. M. Moissan announced that it had now been liquefied by him and Professor Dewar at about 185° C. below zero. The experiments were conducted in the famous glass apparatus invented by Professor Dewar. When a current of fluorine gas is passed into an apparatus maintained in the midst of liquid oxygen in tranquil ebullition at a temperature of  $-80^{\circ}C.$ , liquefaction does not occur. But as soon as that temperature is diminished by exhausting the gas above the liquid oxygen, the liquefaction of the fluorine begins, and a clear yellow and extremely mobile liquid is obtained, which resumes the gaseous state as soon as the temperature rises. This liquid has lost the chemical activity characteristic of fluorine in a state of gas. It no longer attacks glass, silicon, sulphur or phosphorus. Fluorine at a very low temperature, however, still attacks carburetted hydrogen, and its affinity for hydrogen seems still to exist. M. Moissan and Professor Dewar are continuing their investigations, and although solid fluorine has not yet been obtained, M. Moissan is sanguine that this astonishing result will also be secured.



## MINE AND QUARRY STATISTICS OF GREAT BRITAIN.

The usual summaries of statistics relating to mines and quarries in the United Kingdom and the Isle of Man have been issued. The statistics compiled at the Home Office from figures furnished by the inspectors of mines afford general data concerning the mineral industries of the United Kingdom in 1896. They show the number of persons employed, the quantities of mineral raised, the number of fatal accidents and deaths, the number of non-fatal accidents and persons injured, and the death rates from accidents in each inspection district. The information is given separately for mines under the Coal Mines Regulation Act, mines under the Metalliferous Mines Regulation Act, and open workings under the Quarries Act. The Coal Mines Act applies to mines of coal, fireclay, stratified ironstone, and shale; the Metalliferous Mines Act to all other mines; and the Quarries Act to all open workings for minerals which are more than 20 ft. deep.

During the year 1896 the total number of persons employed in and about all the mines of the United Kingdom was 725,803, of whom 692,684 worked at the 3,385 mines under the Coal Mines Act, and 33,119 at the 731 mines under the Metalliferous Mines Act.

Compared with 1895, there is a decrease of 7,600 persons at mines under the Coal Mines Act, and a decrease of 254 persons at mines under the Metalliferous Mines Act. Of the 692,684 persons working at mines under the Coal Mines Act, 557,026, or about 80%, were employed below ground. Of the 135,658 surface workers, 4,517, or about 3·3%, were females.

At the mines under the Metalliferous Mines Act, 19,299 persons, or about 58%, worked below ground, and of the 13,820 surface workers, 597, or nearly 4·3%, were females.

At quarries there were 112,829 persons employed, of whom 56,123 worked inside the actual pits or excavations, and 56,706 outside. The persons employed occasionally at quarries are not included in the above figures.

The total output of minerals at mines under the Coal Mines Act was 208,503,868 tons, of which 195,351,951 were coal, 2,526,044 fireclay, 7,856,586 ironstone, 2,419,525 oil-shale, and 349,762 sundry minerals. Adding 9,309 tons from open quarries, the total output of coal was 195,361,260 tons, which exceeds that of the previous year by 5,708,698 tons. It is the highest output yet recorded.

The total output of minerals at mines under the Metalliferous Mines Act was 3,873,697 tons, of which 2,237,327 tons were iron ore.

The total quantity of stone and other minerals obtained from quarries under the Quarries Act during the year 1896 was 35,641,411 tons.

At the mines under the Coal Mines Act there were 849 separate fatal accidents, causing 1,025 deaths. Compared with 1895 there is a decrease of 19 in the number of accidents and a decrease of 17 in the number of deaths.

At the mines under the Metalliferous Mines Act there were 37 fatal accidents, which caused 40 deaths. Compared with 1895 there is a decrease of nine in the number of accidents and 14 in the number of deaths. At the quarries, under the Quarries Act, there were 117 fatal accidents, which resulted in 124 deaths. Compared with 1895, there is an increase of 15 in the number of accidents and 22 in the number of deaths. Probably this increase is more apparent than real, is the comment of the London *Colliery Guardian*, and is due to a more complete notification of accidents, as the act has become more widely known.

The number of non-fatal accidents reported during the year amounted to 5,520 at mines under the Coal Mines Act, 308 at mines under the Metalliferous Mines Act, and 896 at quarries under the Quarries Act.

The death rate of the underground workers at the mines under the Coal Mines Act was 1·619 per 1,000 persons employed, and that of the surface workers 0·907 per 1,000 employed; the corresponding figures for 1895 were 1·635 and ·877 respectively.

At the mines under the Metalliferous Mines Act, the death rate of the underground workers was 1·710 per 1,000 persons employed. Although this average is still higher than that of the miners under the Coal Mines Act there is a considerable improvement compared with that of 1895, which was 2·391 per 1,000; the deaths from accidents to surface workers show a ratio of 0·507 per 1,000.

At quarries under the Quarries Act, the death-rate from accidents in 1896 of the workers inside the actual pits or excavations was 1·604 per 1,000, and of the persons at factories and workshops outside the quarries, but connected with them, 0·600 per 1,000.

## A PROPOSED INTERNATIONAL TESTING LABORATORY.

A circular recently issued by Dr. Herman Wedding, the eminent metallurgist, refers to the formation at the congress held at Zurich, Switzerland, in 1895, of the "International Society for the Unification of the Methods of Testing Materials of Construction." The council of this society has decided that in order to carry on its work to the best advantage the work hitherto done in many isolated places should be brought together in a common focus, when it could be classified, compared and reduced to a standard.

Such a central laboratory would also have the task of following the progress of both industry and science; of examining all new methods of any importance brought forward in various quarters; of searching for new methods whenever new problems were presented; and of serving as a guide to individual chemists. The establishment of a central laboratory of the kind indicated is far from being an easy matter. In the first instance, national feelings must be reckoned with. It has been universally felt that only a neutral country could be the seat of such an institution, and the unanimous choice fell on the city of Zurich, the intellectual capital of Switzerland, and the seat of the last congress, with scientific institutions of high standing, and furnished with a laboratory for testing materials of construction, erected on the most modern principles; while, on the other hand, no commercial jealousies could possibly be awakened by selecting a country devoid of ironworks of any magnitude.

Whatever place might have been chosen, the first difficulty arising would have been that of obtaining a proper locality for the Central Laboratory. Of course, it was out of the question to raise capital for

building such a laboratory in a foreign country. But, fortunately, it has been possible to secure the use of ample accommodation in the magnificent chemical laboratory of the Federal Polytechnic School. The Federal Council has been pleased to grant the use of these rooms, free of rent, for the projected Central Laboratory, and thus the great difficulty of location has found its solution in the most favorable way. The next step, that of finding a fit and proper head for the Central Institution, has been successfully accomplished by securing the services of a most competent specialist, Hanns von Jüptner, chief chemist of the Neuberg Iron and Steel Works in Austria.

Only one step now remains to be taken, raising a fund for the maintenance of the Central Laboratory, that is, for the salaries of the director and his assistants, for the cost of reagents and other incidental expenses, and further, for remunerating the assistants of some eminent chemists in various countries, who have kindly undertaken to take part in the work proposed. For these purposes \$10,000 per annum is required, and it would be impossible to start the laboratory unless the payment of this expense was secured for, say, ten years. There is no chance of obtaining these funds either by government grants or from the institutions existing in various countries. The only practicable way is, evidently, to obtain subscriptions from the iron-masters of the various important iron-making countries. Looking at the immense importance such a central laboratory is likely to acquire for the whole of the iron industry, and the very large pecuniary benefit ultimately following therefrom, it is suggested that large iron works might contribute, say \$250 per annum each for that purpose. It is desirable to have these contributions come from as many countries as possible.

It may be mentioned that the firm of Krupp, of Essen, has already subscribed \$25 per annum for this purpose, while the Austrian iron-masters have made a handsome beginning by subscribing a sum of \$1,750 per annum. All the other iron-producing nations, it is hoped, will follow.

It may be added that the results secured will be reported at the next meeting of the International Society, which will be held at Stockholm in Sweden on August 23d next.

## TREATMENT OF ORES AT KAPNIK IN HUNGARY.

According to the *Bergund Hüttenmännische Zeitung*, the ores treated at Kapnik amount to about 2,000 tons annually, and contain copper, zinc, lead, and about 0·057% of silver and gold. These ores used to be treated by smelting, but the increase in the cost of fuel and the diminution in the value of the metals produced, especially silver, rendered it imperative to abandon this method. In 1872 the cost of smelting was 4·28 florins (about \$2) per ton, resulting in an annual loss; in 1894, the cost of leaching (giving better technical results) was only 2·50 florins (about \$1·20), giving a profit on the year's work.

The ores are first submitted to a chloridizing roast in a Bode furnace, followed by a finishing roast in a reverberatory furnace. The roasted ore is leached first with hot salt solution of 20° to 22° Baume for four days, by which about three-fourths of the gold and silver are extracted, and the residue is leached with a solution of the hyposulphites of sodium and calcium for two days, at the end of which time the tailings contain only 0·001 to 0·003% of the precious metals. The gold, silver, copper, and lead are thrown down in the metallic state by means of iron from the salt solution, and as sulphides by the metallics of calcium and sodium from the hyposulphite solution.

The entire plant consists of ore-sheds, 18 Bode and 2 reverberatory furnaces, 20 cooling vaults, 20 leaching vats, 462 stoneware tubs for iron precipitation, 65 oaken leaching tanks, depositing and settling tanks, etc. the capital outlay for a plant capable of treating 2,000 tons a year being about \$41,000 in all.

**Cinnabar in Brazil.**—Herr E. Hussak in the *Zeitschrift für Praktische Geologie* says that it has long been known that cinnabar occurs on the Tres Cruces property, close to the station of Tripuhy, situated not far from Ouro Preto, the capital of the province of Minas Geraes. The author has examined this district, and finds that the cinnabar is known only in the form of fragments and pebbles in a thin layer of *cascaho* (alluvium), resting upon steeply inclined strata of highly decomposed metamorphic slates, often micaceous. This formation occurs in all parts of Ouro Preto, often alternating with true itabirite, and showing at times total or partial passage into that rock. Neither in the stratified rocks nor in a dike of black augite-porphry that traverses them, nor in the narrow strings and small lenticules of quartz that occur in them, is there any trace of cinnabar to be found; so that this ore is only known in the alluvial deposit. The latter is in too small quantity to be worth working. Besides the cinnabar, the gravels consist exclusively of the debris of the above-named slates and itabirites, together with various iron ores and a series of curious titano-antimonates characteristic of this district.

**A New Method for Estimating Potassium.**—The following method is given by Mr. H. N. Warren in the *London Chemical News*: The solution containing the alkalis as chlorides having been previously exhausted of the accompanying group metals, is heated with an excess of platinic chloride, and the whole evaporated to very small bulk in a platinum dish, or other suitable receptacle; to the contents are now added about double the original quantity of a mixture composed of equal parts of amylic alcohol and ether. The precipitate is by these means immediately rendered dense, and can thus be washed once or twice with the utmost facility, using the same mixture. The yellow precipitate thus obtained is next transferred to a small glass beaker, and heated to the boiling point with the addition of about 5 c. c. of formic acid. The solution thus speedily assumes a brownish tint, at which stage a slight excess of ammonia is introduced, and re-boiled, when the whole of the platinum is precipitated in the form of black flocks, which may be readily washed and dried, from the weight of which the percentage of potassium present may be readily calculated.

With a little practice the operation will be found more expeditious, more accurate, and at the same time less troublesome, than the general methods advised for the estimation of potassium.

## PERSONAL.

MR. THOMAS WEIR left Salt Lake last week for a month's visit on the Atlantic Coast.

MR. H. H. ROUSSEAU, JR., has been appointed principal assistant engineer of the Pittsburg (Pa.) Bridge Company.

HON. D. W. HIGGINS, Speaker of the British Columbia legislature, is on an extended visit to the Kootenay country.

MESSRS. GEORGE J. MCCARTY, of Mexico, and F. R. LINGHAM, of South Africa, are in San Francisco on their way to London.

MR. W. W. WISHON, mining engineer of Butte, Mont., has returned from the examination of a mining property at Phillipsburg.

MR. WILLIAM QUIGLEY, president of the Chicago Pumice Stone Company, has been visiting the company's workings in Millard County, Utah.

MR. W. S. STRATTON, of the Independence mine at Cripple Creek, Colo., is in Utah and will visit a number of the mining camps of the State.

MR. JOHN G. A. LEISHMAN, formerly president of the Carnegie Steel Company, has been appointed United States Minister to Switzerland.

MR. F. H. KINDL, engineer of the Carnegie Steel Company, has gone to London. Returning he will go to South America in the interests of his company.

MR. JOHN REYNOLDS, of the California Chemical Works, who has been inspecting sulphur mines in Japan, returned to San Francisco on the steamer *Peru*.

HON. J. B. GRANT, of Denver, is in British Columbia. His smelter has quite extensive interests there, and he is also a mine owner of that alluring region.

MR. GEORGE A. SONNEMANN, mining engineer of Spokane, Wash., is making a professional trip into the upper districts of St. Regis and the Seven Devils in Idaho.

MR. JOHN S. FILLMORE, of New York, prominently connected with the New York and Kootenay Company is in the Trail Creek country in British Columbia.

MR. GEORGE D. ROBERTS, of New York, is in the Gold Mountain district, Piute County, Utah, where an Eastern syndicate is about to acquire gold-bearing ground.

MR. C. S. DRUMMOND, of London, England, managing director of the Duncan Syndicate, has been in Nelson, B. C., looking after the development of the company's properties.

MR. E. A. WILSON, for several years superintendent of the Peñoles smelter at Mapimi, Mex., will withdraw about June 15th, and will remain for a short time in Monterey.

MR. WILLIAM VAN SLOOTEN, mining engineer and metallurgist, of New York City, has gone to the State of Washington to examine copper mines and will be absent about six weeks.

MR. J. J. CRAWFORD, ex-State Mineralogist of California, has resumed the practice of his profession of mining and hydraulic engineering, and makes his headquarters in San Francisco.

PROF. ANDREW C. LAWSON, of the Department of Geology and Mineralogy at the University of California, will represent the University at the International Geological Congress in St. Petersburg, Russia, this summer.

CAPT. WM. HALL, superintendent of the Le Roi mine, Rossland, B. C., is visiting the Eastern States and provinces on private business. MR. WILLIAM J. HARRIS has charge of the mine during Captain Hall's absence.

MR. HENRY GUYER, vice-president of the Backus & Johnston Company, of Casapalca, Peru, has just brought to a close a year's vacation in the United States. He is now on his way to Lima, Peru, where he will again take up his official duties.

MR. C. TIZZONI, for some time past an expert for the General Gold Extraction Company, of Denver, Colo., has gone to Europe. He will superintend the erection of a 500-ton Pelatan-Clerici process mill in Russia to treat the ores from the Oural Mountains.

MR. J. E. LESTER, a mining expert well known in Ward, Colo., on June 1st assumed the superintendency of the Gold King mine, near that place, vice Mr. HARRY OLYMPIUS, resigned. Mr. Olympius has gone to Idaho Springs to assume the management of the Cardington mine.

MESSRS. J. B. HARSANT, of Cape Town, South Africa, H. DE R. WALKER, mining engineer, of Liverpool; EVERETT DAGGETT, of Salt Lake; DR. J. NEUSTADT, naturalist, of Vienna (who has spent several months in Japan and China); E. S. DE GOLYER and O. P. POSEY, of the Tom Boy mine, are in San Francisco, Cal.

MR. WILLIAM JONES, former superintendent of the refinery department of the Kansas City Consolidated Smelting and Refining Company, with

Messrs. W. ROARK and ALFRED LINDELL, former blast furnace men in the Argentine Smelting Works, have gone to Johannesburg, South Africa, where they will go to work for the Rand Central Smelting Company in a new gold refinery.

MR. RANDOLPH ADAMS, mining engineer and general manager of the Central mine, owned by the Sulphide Corporation at New South Wales, resigned his position a few weeks ago on account of ill-health. He intends to visit the United States soon. MR. C. F. COURTNEY, who has been engaged for 14 years at the Tharsis sulphur and copper mine, will succeed Mr. Adams as general manager of the Central mine.

## OBITUARY.

JOHN R. CONNOR, foreman at the Hollenback mine of the Lehigh & Wilkes-Barre Coal Company, died at Wilkes-Barre, Pa., on June 2d, aged 58 years.

WILLIAM ROTHOFF, superintendent of a blast furnace at the Breaker Island plant of the Troy Steel Works, died at Menand's Station, N. Y., on May 29th, aged 43 years.

NORMAN J. MERRIAM, a civil engineer, died recently at Spokane, Wash., aged 51 years. For 15 years he was in the employ of the government, and for four years past has been a resident of Coeur d'Alene, Idaho.

WILLIAM BAYRES HICK, a mechanical engineer, died recently in York, England, aged 66 years. He was born there, and in 1863 came to America, entering the employ of Coxe Bros. & Company, in the Mahoning coal district. In 1879 he opened an office in Wilkes-Barre, Pa., as a mechanical engineer, and in 1894 returned to England.

HARRY VAN NEW KIRK, general superintendent of the Bermuda Asphalt Paving Company, died recently in Chicago, aged 64 years. He was born in Maryland in 1833, and was until his death one of the foremost constructors of asphalt paving in the United States. In Washington he was associated with A. L. Barber in laying the first asphalt pavement in America.

JAMES STIFF, of the London Pottery, Lambeth, and Suffolk House, Clapham road, died recently at Swanage, England, at the age of 88 years. Going to London in 1826 as a poor country youth, he worked his way, and after 12 years' service with Messrs. Doulton & Company, of the Lambeth Pottery, was able to start in business on his own account. He was well known as a manufacturer of crucibles.

MAURICE H. MATSINGER, one of the oldest iron manufacturers in Philadelphia, Pa., died suddenly at his residence on May 31st. Death was due to paralysis. Mr. Matsinger was born in Philadelphia 65 years ago. He was associated with his father in the manufacture of builders' iron work, ranges, heaters, etc., from an early age, and in 1856 the business was transferred from the father to two sons Maurice and his brother Charles.

M. ERSKINE MILLER, of Staunton, Va., aged 53 years, one of the foremost business men of Virginia, died June 6th near Redlands, Cal., where he had gone for the benefit of his health. Mr. Miller had a national reputation among coal operators. After the civil war, in which he served, he went to Virginia from Alabama. Beginning as a retail coal dealer, he pushed his interests until at the time of his death he was the owner and operator of several of the most productive of the West Virginia mines. He was president and manager of the Turkey Knob Coal Company, the New River Coke Company, the Thurmond Coal Company, the Fire Creek Coal and Coke Company, and was also the owner of thousands of acres of valuable timber and mineral lands in West Virginia.

PROF. ALVAN G. CLARK, the famous telescope lens manufacturer and astronomer, died of apoplexy on June 9th, at his home in Cambridge, Mass., aged 65 years. He was born in Fall River, Mass., and in business was associated with his father, forming the firm of Alvan Clark & Sons, the senior member of which, Alvan Clark, was the first American to make large achromatic lenses. Alvan G. Clark successfully completed many famous lenses, among which are the Chicago reflector, the 26 in. lens in the Naval Observatory at Washington and the 30 in. reflector for the Imperial Observatory at St. Petersburg, Russia. During 1886 the 36 in. reflector, then the largest in the world, was made for the Lick Observatory, but the lens for the Yerkes telescope of the Chicago University, which was his last production, is now the largest in the world. He also made several valuable astronomical discoveries by observation through his lenses. The Clarkers were awarded the Leland gold medal by the French Academy of Sciences in 1862, and the honorary medal of Russia, for the excellent lenses which they had manufactured.

## SOCIETIES AND TECHNICAL SCHOOLS.

THE LEHIGH UNIVERSITY.—The 29th annual commencement of this well-known institution at South Bethlehem, Pa., will take place on June 16th. In

the graduating class are 78 young men who have been prepared in engineering subjects as follows: Civil engineering, 20; mechanical, 22; mining, 10; electrical, 23, and in analytical chemistry, 3. With the close of the present collegiate year Prof. H. Wilson Harding voluntarily retires from the chair of physics and electrical engineering, which he has occupied for 25 years. He is succeeded by Prof. William S. Franklin, of Iowa State University.

ENGINEERS' CLUB OF ST. LOUIS, MO.—The 456th meeting was held June 2d at 1600 Lucas Place. The paper of the evening, by Prof. W. K. Hatt, of Lafayette, Ind., was entitled "Notes on the Location of Mountain Railways." The general problems to be overcome in the location of mountain railways were first set forth and numerous examples of their solutions were cited. The writer described the Swiss railways and exhibited plans, sections and lantern slides showing views along the lines. Rack railways and cable railways for mountain service were described and illustrated. A large number of views were shown of the Callao-Lima Railway, of Peru, which reaches the highest point and exhibits the most difficult construction of any in the world.

IRON AND STEEL INSTITUTE.—The autumn meeting of this Institute will be held at Cardiff, Wales, on August 3d, 4th, 5th and 6th next. The programme will embrace visits on August 3d to the Bute Docks, the Cardiff-Dowlais Works and to other works in the vicinity. On August 4th Penarth Docks and other works on the Taff Vale Railway will be visited; and on August 5th a visit will be made to the Dowlais and Cyfarthfa steel works. A detailed programme will be issued when the local arrangements are further advanced. This programme will also contain a list of the papers that are to be read.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—The 29th annual convention will be held at the Chateau Frontenac, Quebec, Canada, beginning at 10 o'clock, on Wednesday, June 30th, 1897, and continuing through Thursday and Friday, July 1st and 2d. During the convention, meetings for the reading and discussion of professional papers will be held, and it is also expected that informal addresses will be given by several engineers residing in Canada on local engineering works of interest. Three papers will be presented as follows: "The Relation of Tensile Strength to Composition in Structural Steel," by A. C. Cunningham; "Recent Tests of Bridge Members," by J. E. Greiner; "The Power Plant, Pipe Line and Dam of the Pioneer Electric Power Company at Ogden, Utah," by Henry Goldmark.

ENGINEERS' CLUB OF CINCINNATI, O.—At the regular meeting, held on May 20th, Mr. Paul Starrett, superintendent of construction of the new Union Passenger Station being erected at Columbus, O., by the Cleveland, Cincinnati, Chicago & St. Louis and the Pittsburg, Cincinnati, Chicago & St. Louis Railway Companies, and now nearing completion, entertained the club with a description of the work under his charge, illustrating his lecture with stereopticon views. This structure will be one of the most pretentious and elegantly appointed buildings of the kind in the United States. In addition to the passenger depot proper there is being constructed at the same time and as a part of the improvement, a viaduct spanning the tracks at the locality, which serves as an approach to the depot and which is lined with buildings serving as a screen for the tracks and yards of the railway companies; this being a requirement of the city in the arrangement made with it for the work. Shops for the railway companies are also being built under the same contract with the balance of the work. The approximate cost of the entire work is over half a million dollars.

AUSTRALASIAN INSTITUTE OF MINING ENGINEERS.—The annual gathering for the current year was held in Sydney. The opening session took place on April 20th.

The following officers were elected unanimously: President, F. Danvers-Power; vice-presidents, H. W. F. Kayser, J. Warren and H. H. Schlapp; councillors, R. Adams, H. R. Hancock, H. H. Knapp, A. J. Hodgkinson-Carrington, A. Montgomery, J. Howell, T. G. Davey, G. G. Turri, E. J. Rigby, A. G. Holroyd, A. E. Ashcroft and Uriah Dudley; secretary, A. S. Kenyon; treasurer, H. Rosales.

Mr. Power, the newly elected president, read a paper, which gave evidence of much reading and original research, on "Receptacles for Valuable Mineral Deposits."

April 21st was devoted to the reading and discussion of papers. Mr. James Stirling, the Government Geologist of Victoria, contributed "Observations on Temperatures of Deep Mines"; Mr. F. D. Johnson an essay on "Perforated Rocks in the Coo'gardie District"; Mr. T. White on "An Improved Blanket Table"; M. H. F. Collins on "A New Method of Smelting Lead Concentrates," and Mr. Leslie Holly on "The Lefroy Goldfields, Tasmania."

In the afternoon the members availed themselves of the invitation of the Minister for Mines, and took a very enjoyable trip around the harbor in the government steam launch.

In the evening members and friends were invited by the president to a conversation. With the help of a powerful magic lantern, and a large screen, extending across the end of the hall, he showed graphically a number of mining operations, commencing from the sinking of a shaft, and going



through the whole range of proceedings, to the final panning off. Mr. Pittman, Government Geologist, gave a lecture on "Artesian Bores," and Professor David, assisted by illustrations, gave the audience some popular and interesting information on "Earth Architecture."

The Government Metallurgical Works at the Clyde were visited by the Institute on Thursday, April 22d. Alterations and additions are being actively pushed forward, but the works are not yet complete. At the Clyde Ore-crushing and Chlorination Works, which are very compact and complete, the various processes in operation were shown to the visitors by Mr. F. B. Brown, the manager. The members also inspected the engineering establishment of Hudson Brothers.

In the evening a paper by Mr. A. G. Holroyd on the "Discovery and Occurrence of Telluride of Gold in the Kalgoorlie Goldfield," was read by the secretary, and a paper by Mr. E. Lidgley on "Some Indications of Ore Deposits."

Mr. J. W. Jaffray's paper on "Recent Developments in Gold-extracting Machinery, and Some Causes of Failure," occupied the meeting on the morning of April 24th. In the afternoon the members visited Mort's Dock and Engineering Works.

On April 25th, by invitation, the visiting members made a trip to Dapto to inspect the large smelting works of the Smelting Company of Australia, which are now rapidly approaching completion.

The morning of April 27th was devoted to the discussion of papers. The first was by Mr. Oscar Schulze on "The Belabula Dam," near Carcoar, New South Wales. Papers by Mr. E. M. Thornley on "Hydraulic and Ground-sluing in New Zealand, and a Comparison with the Drift and Gravels of the Corinna District of Tasmania," and by Mr. Luke Williams on "The Treatment of the Mount Reid Company's Auriferous Ores with Cyanide," were also brought before the meeting. In the evening a paper was read by Mr. G. G. Turri on "Some Recent Developments in the Attempt to Amend the Cyanide Patent."

#### INDUSTRIAL NOTES.

Clinton Furnace of the Clinton Iron & Steel Company, Pittsburg, Pa., has been banked.

The Dickson Car Wheel Company, of Houston, Tex., has increased its capital from \$75,000 to \$100,000.

The Baltimore Brass Manufacturing Company, with principal office at Charleston, W. Va., has been chartered.

The Taylor Foundry & Machine Company, capital \$10,000, has been chartered by J. S. Christian and others, to do business at Tyler, Tex.

Excelsior Furnace, at Ishpeming, Mich., is now about ready to start up, a delay of about a month being necessary beyond original expectations.

The Embreeville (Tenn.) Furnace Company, according to report, will this summer construct two new iron furnaces of 100 tons' capacity each per day.

The Ohio Valley Cement Company has been incorporated at Louisville, Ky., by James O'Connor, D. L. Irwin and others, with a capital stock of \$92,000.

The Jackson-Woodin Manufacturing Company, of Berwick, Pa., has secured a contract for 1,360 tons of cast-iron pipe for the water department of Syracuse, N. Y.

The Phoenix Iron Works, Phoenixville, Pa., are running day and night on double turn. The material for the Park bridge across the Schuylkill in Philadelphia is all turned out.

The Carbon Iron and Steel Company's furnace, at Parryville, Pa., after a continuous run of two years, is being blown out. The work of relining the stack will be begun as soon as possible.

The Universal Mill of the Pottstown Iron Company, the Valley Mill of the Glasgow Iron Company, and Glendale Rolling Mill, all of Pottstown, Pa., started operations during the present week.

The Ellwood Tin Plate Company, Ellwood, Pa., has elected the following officers for the coming year: President, H. A. Bishop; vice-president, A. W. Brown; treasurer, Charles Babcock; secretary and Superintendent, J. R. Phillips.

The West Leechburg Steel and Tin Plate Company, of West Leechburg, Pa., has been granted a charter of incorporation, with a capital stock of \$30,000. It is reported that it will build a sheet mill and tin-plate plant at the above place.

The White Cliffs Portland Cement Company's works at White Cliffs, Ark., have been sold, Eden Bora having secured a controlling interest for \$100,000. It is said that the company will be reorganized and the capacity of the works greatly increased.

The Burgess Steel and Iron Works, Portsmouth, O., will be enlarged by adding an open-hearth basic steel furnace of 35 tons capacity, and a 28-in. blooming mill, which will enable the firm to make its own billets and slabs. The work has already been started.

The National Iron Works Company, Duluth, Minn., has been re-organized, the name of the new concern being the National Iron Company. The

officers are: J. Evered, president; W. Evered, vice-president, and Harry Armstrong, secretary and treasurer.

The Phillips Tin Plate Company, Philadelphia, has re-organized and been incorporated under the same name. F. R. Phillips will act as general manager and have charge of the buying and selling of the product of the new corporation. The company's works have restarted.

The Niagara Falls Power Company on June 8th filed a certificate of an increase of its capital from \$3,000,000 to \$3,500,000. The company's debts do not exceed \$10,000, outside of a mortgage indebtedness incurred to secure the purchase price of real estate and the payment of certain bonds.

The Port Oram, N. J., furnace was put in blast June 8th, after being idle since February. The plant is owned by Joseph Wharton, of Philadelphia, and has a capacity of turning out 1,000 tons of iron a week. One hundred men were put to work, not including the miners employed at the Hibernia mines, owned and operated by Mr. Wharton.

The Standard Oil Works' entire plant in Cleveland, O., shut down for an indefinite period on June 7th. Close to 1,000 men are thrown out of work by the shut-down. It is said that the Standard has an immense stock on hand in the warehouses at Kingsberry Run, enough, in fact, to supply the demand in the Cleveland District until January 1st, 1898.

The Lockhart Iron and Steel Company's puddling plant at McKees Rocks, Pa., after a shut-down of four months has resumed in part. The plant has been unable to run on account of a lack of orders. A few days ago the puddlers were notified that they could go to work at the \$4 rate. Quite a number signified their willingness to accept the terms and started work.

John Hamilton, the well-known tin-plate manufacturer of Pittsburg, Pa., has just concluded negotiations for the location of a tin-plate plant at West Newton. The plant will contain two mills and will be complete in every detail. As yet no plans have been prepared, and machinery such as necessary in a tin mill will be required. The buildings will probably be of fireproof construction.

The new Buhl open-hearth steel plant, at Sharon, Pa., has made the first cast from furnace No. 1, and about 25 tons of excellent steel was the result of the test. It was made into slabs and was worked into sheet steel at the old mill. All of the six furnaces are in operation, and casts are made every 12 hours. The plant cost \$600,000 to build, and is one of the largest and most complete in the country.

At Beaver Falls, Pa., an application has been made for a charter for a gas engine manufacturing company, with a capital of \$40,000, to start a plant in the old works of the Champion Saw Company. The incorporators are: R. M. Downey, J. W. Forbes, E. W. Bentley, J. D. McAnlis, J. A. Haller, George S. Hunter and William Pierce. In the preliminary organization R. M. Downey was made president; J. W. Forbes, treasurer, and E. W. Bentley, secretary.

The Ironton Structural Steel Company, whose plant is on the edge of Duluth, now claims that the structural mill it has been experimenting upon for the past two years is a success. It is stated that at a run made last week 24 in. beams were rolled, uniform throughout, with web of 3/8 in. and flanges of 7/8 in., the weight being 59 lbs. per foot. Of 17 I-beams turned out in the experimental run 14 were perfect, while in two others the defects were very slight.

The Warren City Boiler Works plant at Warren, O., was burned May 29th. The proprietors have already contracted for a new building 100 ft. wide by 200 ft. long. They have also purchased considerable new machinery in way of shears, punches and rolls, and expect to put in a steam traveling crane of 45-ft. span. At the time of the fire they were crowded with orders and were working day and night. They expect to be running not later than June 15th.

The Berlin Iron Bridge Company, of East Berlin, Conn., is erecting a new roof for the power station of the Scranton Illuminating Heat and Power Company, of Scranton, Pa. The building is 42 ft. wide and 195 ft. long, divided into two portions: a boiler-room and an engine-room. The framework of the roof construction is of steel and absolutely fireproof. It has been the aim of the Scranton Company to erect a substantial and fireproof building, to replace the one which was recently destroyed by fire.

#### TRADE CATALOGUES.

Fred. J. Swaine, St. Louis, Mo., has issued a new catalogue of presses, dies and special machinery for sheet metal workers, of which he is the manufacturer. Since the last catalogue was published many improvements have been made upon these manufactures, whose general excellence is well known to the trade, and can be seen by a careful perusal of the pages of the catalogue.

The Snow Steam Pump Works, Buffalo, N. Y., manufacturers of steam pumps, pumping engines and hydraulic machinery, have an 1897 catalogue that is exceptionally well printed. Its numerous

half-tone illustrations show the many forms of pumps and other machinery at a special advantage, while the accompanying descriptions tell concisely what an intending purchaser desires to know about them. The products of this company's works are widely and extensively used, and everywhere give thorough satisfaction.

The Philadelphia Engineering Works, Limited, Philadelphia, Pa., have two new catalogues that will be of much interest to the users of power. One of these is on the subject of compound air compressors driven by cross-compound condensing steam engines and the other on reversing rolling mill engines. To illustrate the latter class the catalogue gives views and descriptions of a balanced slide valve reversing mill engine, which was built for the Keystone Axle Company, of Beaver Falls, Pa.

#### NEW PATENTS.

##### UNITED STATES.

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

##### WEEK ENDING JUNE 1ST, 1897.

583,489. PROCESS OF MAKING SMOKELESS POWDER. Hubert Kolf, Bonn, Germany. Patented in Germany May 4th, 1896, No. 38,768, and September 23rd, 1891, No. 62,149, and in England December 10th, 1892, No. 22,739. The process consists in nitrating a carbohydrate, treating the same successively with solutions of an alkaline sulphide and an alkaline nitrate, and mixing therewith a nitro product not charged with an alkaline nitrate and sulphur.

583,513. ELECTROLYSIS OF WATERY SALT SOLUTIONS. Wilhelm Spilker, Berlin, Germany. The process for the production of endosmotic membranes for use in the electrolysis, by the electrolysis itself, consists in separating by means of a membrane serving as a foundation diaphragm, an alkaline cathode solution from an anode solution, consisting of a mixture of the chlorides of the alkali metals and calcium holding the corresponding oxyhydrate, caustic lime, in solution, and causing a solid porous coating to be firmly attached to the foundation membrane on the side of the anode space by passing an electric current through the bath.

583,515. PROCESS OF MAKING ARTIFICIAL STONE. Chas. W. Stevens, Lansing, Mich. The process consists in placing a layer of stone compound between layers of sand and saturating the mass with water.

583,602. ORE WASHING MACHINE. William F. Mitchell, Salt Lake City, Utah. The combination of a main frame, an inclined riffle frame suspended by hangers within the main frame to vibrate at right angles to its length and formed of parallel angle bars and having inwardly projecting riffle catches or retainers at their lower ends, a series of riffle boxes mounted at their ends on the angle bars and held in place against downward movement by the catches or retainers, to permit the removal of the lowermost riffle box and the insertion of a clean riffle box between the upper ends of the bars, and mechanism for operating the riffle frame.

583,618. VACUUM ELECTRIC ARC FURNACE. Hiliary Elbridge, George H. Wright and Daniel J. Clark, Galveston, Tex. The combination of a cylindrical pot cathode and a hollow cylindrical anode supported for vertical adjustment within the cathode and of diameter nearly equaling that of the cathode, to form a receptacle for holding the substance to be fused, and so as to lie in sufficiently close proximity to the sides of the cathode whereby an arc will be maintained between the adjacent sides of the anode and cathode.

583,619. ORE CRUSHER. John P. Hanson, Butte, Mont. Assignor of one-half to Abram T. Kerr, Buffalo, N. Y., and James H. Kerr, Helena, Mont. The combination with the pan, of an upright stationary shaft or arbor secured centrally to the pan, a hub capable of turning on the arbor, but held against vertical movement thereon, a driving head capable of sliding vertically on the hub, but held against turning thereon, and crushing rollers running in the pan and journaled on the head.

583,642. APPARATUS FOR HOISTING AND CONVEYING. Jeremiah Campbell, Chelsea, Mass. The combination of a horizontal track or cable, a sheave at one end of the track or cable, sheaves at the other end of the track or cable, a trolley movable on the track or cable, the rolls carried thereby, a trolley-actuating rope extending from the trolley in one direction only, around the end sheave and from thence backward over another sheave to a winding-drum, the steam-shovel of the character specified, its closing and opening ropes and hoisting and lowering rope both extending over the rolls of the trolley to the sheaves at the end of the track or cable and from thence to the winding drums, the winding drums of the same diameter and adapted to be run separately and together at the same speed, whereby all the ropes in transferring the shovel and trolley travel at the same rate of speed and thus maintain a constant relation between the shovel and trolley during its transferring movement, and whereby also a rope moves the trolley in one direction and one of the ropes serves to move the trolley in a reverse direction without changing the relation of the shovel.

583,671. APPARATUS FOR MAKING WATER-GAS. Charles R. Collins, Philadelphia, Pa. Assignor to The United Gas Improvement Company, same place. The combination of a fixing chamber, a separate carbureting chamber, a neck or pipe leading from the carbureting chamber to the fixing chamber and comprising a detachable coupling, a valve adapted for opening and closing the pipe or neck and carried by the section of the coupling which is applied to the fixing chamber, a generator, and valved pipe connections from the generator to the fixing chamber and to the carbureting chamber.

583,697. GAS-MAKING APPARATUS. James E. Weaver, Pittsburg, Pa. The combination with a series of grates, of a horizontal series of connected retorts above the same, a casing of refractory material for the sides and bottoms of the retorts, and a continuous roof of tiles covering all the retorts, an arch

above the retort-roof a series of heating-pipes carried thereon, and a cover over these pipes.

- 583,751. MANUFACTURE OF WHITE LEAD. John W. H. James, London, England. Patented in England October 1st, 1891, No. 5,287; in France October 1st, 1891, No. 216,474; in Belgium October 1st, 1891, No. 96,644, and in Italy January 5th, 1892, No. 31,078. A carbonator comprising a cylinder, a shaft extending through the cylinder having affixed thereto beater-arms adapted to be rotated when the shaft is rotated, a trough formed in the cylinder-casing, a supply pipe or pipes opening into the trough, and tubes or pipes extending from the trough and opening into the lower portion of the cylinder.
- 583,757. APPARATUS FOR MANUFACTURING ACIDS. Chas. W. Laing, Brooklyn, N. Y. The combination, with a liquid supply, of an oscillating dump provided with measuring chambers and with trunnions adjustable transversely to the horizontal axis of the dump, supporting bearings for the trunnions and means for limiting the oscillation of the dump.
- 583,761. ACETYLENE GAS GENERATOR. Frank A. Mitchell, Wilmington, Del. The combination with a water reservoir, and a generator, of a generator, a valved water-supply pipe between the reservoir and the generator, and a valved branch water-pipe communicating with the generator whereby to provide independently controllable water-feed connections between the generator and the water reservoir.
- 583,779. PROCESS OF AND APPARATUS FOR DEODORIZING OILS. James R. Whiting, Stamford, Conn., and William A. Lawrence, Waterville, N. Y. The process consists in first reducing the oil to a vapor, then passing the vapor through charcoal, then through lime water, and then condensing the vapor.
- 583,818. CARBURTER. Frederick A. Redmon, San Francisco, Cal. The combination of an outer casing, a bottomless inner casing depending from the top thereof, the sleeve supported in the bottom of the outer casing and extending upwardly within the inner casing, the porous filling and the screen extending entirely across the inner casing for supporting the same, the upper edge of the sleeve contracting with the screen, and the inlet and outlet pipes.
- 583,837. COMPRESSED-AIR WATER ELEVATOR. William S. Bechtol, Goliad, Tex. A stand-pipe having its lower end closed, except to the free admission of liquid thereto to afford a barrier against the internal pressure of liquid or air therein affecting the source of liquid supply in which the stand pipe is immersed, combined with an induction pipe which is connected to the closed lower end of the stand pipe so as to receive from the source of liquid supply, an induction pipe, a floatable piston, and an air forcing mechanism.

#### GREAT BRITAIN.

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

##### WEEK ENDING APRIL 24TH, 1897.

- 7,315 of 1896. J. E. Preston, London. In amalgamators, forcing the pulp through a mercury bath by means of an archimedean screw.
- 7,422 of 1896. R. A. Hadfield, Sheffield. Steel alloys containing less than 1% of carbon, about 5% of manganese and from 13 to 20% of nickel; non-magnetic and suitable for wire.
- 10,494 of 1896. J. R. Wyde, J. W. Kynaston and J. Brock, Liverpool. Method of recovering zinc from the spent liquors of copper leaching.
- 5,452 of 1897. W. H. Baxter, Leeds. In stonebreakers, method of taking up the wear of the jaw and reducing the friction of the shaft.

##### WEEK ENDING MAY 1ST, 1897.

- 7,436 of 1896. W. Gibbins, Widnes. In blast furnaces, keeping the fuel in the center and away from the sides.
- 10,342 of 1896. A. Gutensohn, London. Furnaces for breaking quartz by alternate heating and chilling.
- 10,784 of 1896. R. Moodie, London. Leaching apparatus.
- 12,782 of 1896. A. Wilson and F. Stubbs, Sheffield. Carbonizing iron with carbide of calcium or aluminum.

#### MACHINERY AND SUPPLIES WANTED.

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

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

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

#### GENERAL MINING NEWS.

**OIL PRODUCTION AND NEW WELLS.**—The Oil City Derrick reports for May, 1897, that there were 485 new wells completed in the New York, Pennsylvania and West Virginia field in that month, with a daily production of 9,097 bbls.; 801 wells were under the drill on June 1st. For the same month the Buckeye, Ohio, field showed 226 new wells completed, with a daily output of 4,175 bbls., and 248 wells drilling on June 1st. In the Southeastern, Ohio, field there were 63 new wells completed, with a daily production of 374 bbls., and 42 wells at work at the end of the month. The Indiana field showed 49 new wells completed during May, with a daily capacity of 1,295 bbls., and 64 wells drilling on June 1st.

#### ALABAMA.

**NEBRASKA PETROLEUM AND MINING COMPANY.**—This company has succeeded in securing options on 50,000 acres of land in Madison and Limestone counties. Within a short time this company expects to begin to bore for oil, which is known to exist on some of these lands.

#### BLOUNT COUNTY.

It is reported that good iron ore has been found on Red Mountain, near Oneonta, and that preparations are being made to develop the vein.

#### ALASKA.

**ALASKA-TREADWELL GOLD MINING COMPANY.**—This company reports the clean-up for the month of May, as follows: Period since last return, 30 days; bullion shipment, \$40,928; ore milled, 20,383 tons; sulphurets treated, 295 tons; of bullion there came from sulphurets, \$10,597.

#### ARIZONA.

##### COCHISE COUNTY.

**GOLDEN RULE.**—This mine, 10 miles from Cochise station, has been sold to J. W. Bibbins, of Philadelphia, for \$50,000. The mine is a low-grade gold proposition with a large deposit of free-milling ore.

##### GRAHAM COUNTY.

**GRAND REAVE.**—This mine, in Arivaipa Canyon, owned by George Raun and Charles Cunningham, has been bonded to a New York syndicate, who will proceed to develop the property to a considerable extent.

##### PINAL COUNTY.

**BONANZA, LADY BRYAN, QUEEN, SPRING AND ESTRELLA.**—C. D. Henry and C. A. Richie, of Florence, have discovered and located these mines about 25 miles east of Florence and about 50 miles from a railroad. They are said to carry gold and lead in sufficient amounts to pay for working. In the Bonanza the cropping is over 400 ft. wide, and a large quantity of ore is in sight. The Lady Bryan mine is on the same cropping as the Bonanza and has the same class of ore. The shaft is in 10 ft. The Queen mine is on the east extension of the Bonanza. The cropping shows on the surface 80 ft. wide. An open cut has been made and 40 tons of ore are on the dump. The Spring mine is located about 500 ft. north of the Queen mine on a parallel vein. No work has been done. The Estrella mine is the west extension of the Spring mine. No work has been done. Ore shows on the surface 25 ft. wide.

##### YAVAPAI COUNTY.

**CROWN POINT.**—The shaft in this mine, near the Walnut Grove dam, is now down 150 ft. When the owners reach a depth of 200 ft. they will order a mill to place on the property. At the present depth the vein has widened out considerably more than the width of the shaft.

**RED ROCK.**—The double compartment in this mine in Big Bug district is down 60 ft., ore from the bottom of which assays well in gold, silver and copper. This mine has been worked for the past 20 years and has turned out much profitable ore. It has not less than 2,000 ft. of development work.

##### YUMA COUNTY.

**KING OF ARIZONA MINING COMPANY.**—This company's mill, on the Gila River, near Mohawk, started up recently on ore from the King of Arizona mine, and from the two tons crushed during the first day's run there is said to have been over \$1,200 worth of gold extracted. The 5-stamp mill started up in good shape, and as the contractors, Culver & Young, are able to keep a sufficiency of ore on hand, it will be run continuously.

#### ARKANSAS.

##### GARLAND COUNTY.

**GEBHARDT.**—Large quantities of ore are being taken from these iron pyrite mines near Hot Springs. A shaft is being sunk to a depth of 100 ft. and a large force of men is at work. The company will soon begin the shipment of ore on a contract for 5,000 tons.

#### CALIFORNIA.

##### AMADOR COUNTY.

(From Our Special Correspondent.)

**ULYSSES.**—This mine, about two miles south of Jackson, which parallels the Amador Queen, is being operated by P. L. Shurman, who is driving a tunnel to cut the leads at the 400-ft. About 500 ft. of this tunnel has been completed. By an agreement with the Amador Queen No. 1, this tunnel has been run 420 ft. through its ground. Under the same agreement 10 stamps of the 60-stamp mill belonging to the Amador Queen will be used.

##### CALAVERAS COUNTY.

(From Our Special Correspondent.)

**ECLIPSE.**—At this drift mine, 3½ miles southeast of Mokelumne Hill, on Tunnel Ridge, preparations are being made to work on an extensive scale. A pipe line is being put in and a mill erected. An upraise will be made from the tunnel to the channel, which is known to be very rich. Frank Hall is superintendent.

**SIERRA RAILROAD.**—This railway has been completed for 18 miles from Oakdale, where it connects with the Southern Pacific Railroad, and the track-layers have reached Cooper's Ranch, 4 miles further. A temporary depot will be erected at this point, and freight and passengers will be handled about June 10th.

**TRACY GOLD MINING AND MILLING COMPANY.**—This company is making arrangements to sink a 500-ft. shaft at the old G. A. R. mine, near Angel's Camp. The mine now known as the Tracy is on the same ledge as the Utica, and shows a ledge of good ore.

#### ELDORADO COUNTY.

(From Our Special Correspondent.)

**LUCKY MARION.**—This mine, half a mile west of Greenwood, comprises 73 acres, and is owned by a St. Louis company. The mine is well equipped with machinery, including a Merralls mill recently put in. Development work is being pushed under the superintendency of J. W. Neir.

#### KERN COUNTY.

(From Our Special Correspondent.)

**KENYON.**—The pay streak at this mine at Randsburg continues to hold out, being 3½ ft. in width on the 315-ft. level. Eighty sacks taken out during the week ending May 29th are said to be very rich.

**RAND MOUNTAIN MINING COMPANY.**—This company has been organized, with a capital of \$1,000,000, to work a group of claims between the Rand mine and Wedge Hill. They are known as the Twin Bros., Coloratha-Wedge, Coloratha-Wedge No. 2, Bald Eagle and Lillian V.

#### LASSEN COUNTY—HAYDEN HILL DISTRICT.

(From Our Special Correspondent.)

**BLUE BELL.**—Work is being pushed in this mine and some good ore taken out.

**ECLIPSE.**—This mine, located on the extension of the Golden Eagle lode, is being worked under lease, by Whiteman & Pierce. A recent vein of ore yielded, we are told, about \$20 per ton. This mine, which should be one of the best in the camp, has remained undeveloped owing to the death some years ago of the owners, Aule & Denbar. The property has since been held by the heirs of the deceased miners, who have neither developed it nor been willing to give a satisfactory lease.

**GOLDEN EAGLE.**—This mine, under the management of F. W. Stone, has resumed work. The stamp mill will be started shortly, but will be replaced as soon as possible by more improved machinery. A plant for the treatment of the large body of tailings on hand will be put in the present season. Arrangements are also being made to sink the shaft to a greater depth.

**GOPHER.**—J. Thad. Jones recently returned from Oakland, where he spent the winter, and resumed work upon this claim. The shaft is now down 100 ft. and a drift will be run to cut the vein. Some very rich ore was encountered in the upper drifts, but the vein at that point was small.

**HAY SEED.**—This mine has several hundred tons of ore on the dump which will probably yield \$50 per ton. The 180 level is being driven along the vein to a connection with the Brush Hill works. A large body of ore still remains in the stopes.

#### MADERA COUNTY.

(From Our Special Correspondent.)

**CALEDONIA.**—At this mine, on the north end of Potter Ridge, five miles east of Grub Gulch, a Morris mill is running full blast on high-grade ore which contains 4% of sulphurets.

**SAVANNAH.**—This property, located two miles southeast of Grub Gulch, comprises the Minneapolis, Savannah, Wide Awake, Old Joe and Petersen mines. The 10-stamp mill is running steadily on good ore. C. W. Haskell is superintendent.

#### NEVADA COUNTY.

(From Our Special Correspondent.)

**KIRKHAM.**—This mine, two miles northwest of Nevada City, has been purchased by E. A. Denicke and L. S. Rose, of San Francisco. It is their intention to immediately erect a mill and hoisting works and they will develop the property on a large scale.

**LAST CHANCE.**—This mine, two miles south of Maybert, on Diamond Creek, has been bonded to R. Rae, who has a force of 20 men at work and keeps the mill running on good ore.

**NINETY-SEVEN.**—This mine, in the Willow Valley District, about 2½ miles from Nevada, formerly known as the Rising Sun mine, has been bonded to New York parties for \$10,000. The property has been developed by an inclined shaft down 400 ft. on a rich 8-in. vein, which mills from \$20 to \$40. The shaft will be sunk to the 900-ft. level.

#### PLUMAS COUNTY.

(From Our Special Correspondent.)

**GLAZIER.**—At this drift mine, on the north fork of the Feather River, four miles southeast of Butte Valley, a second tunnel is being run to tap the channel at a greater depth. This claim comprises 165 acres on the Dutch Hill channel.

#### SISKIYOU COUNTY.

(From Our Special Correspondent.)

**BLUE GRAVEL.**—At this drift mine, 1½ miles south of Yreka, the shaft has been sunk 108 ft. to bedrock. The pumping plant is working very smoothly and is now handling all the water.

#### SONOMA COUNTY.

(From Our Special Correspondent.)

**GRIZZLY COPPER MINING COMPANY.**—This company has been organized by William Peters, C. Brumfield, F. O. Brandt, O. Messner and C. Reinars as stockholders. It is the intention of the managers of the company to re-open a copper property in Pena Canyon, about 10 miles north of Healdsburg. The two tunnels have been cleaned out and a rich 16-ft. vein exposed, which is said to average \$12 per ton.



## TUOLUMNE COUNTY.

**RAWHIDE GOLD MINING COMPANY.**—This company, of West Virginia, has brought suit in equity in the United States Circuit Court against the Tuolumne County Electric Power and Light Company. The latter company recently brought suit against the former for \$7,466.67, due for electric power furnished a gold mine in Tuolumne County. An agreement was entered into between the two companies by which 150 H. P. was to be supplied to the machinery at the mine for 24 hours every day for two years at a monthly price of \$10 a H. P. The dispute is over the amount furnished, the Rawhide Mining Company claiming that, as the meter measuring the power was placed so far from the machinery, a great deal of the power was lost in transmission. It asks that the agreement be modified so that the meter can be placed in the mill and the full power can be obtained.

## COLORADO.

## BOULDER COUNTY.

**MOUNTAIN QUEEN AND CAMERA.**—Major Miles Jain has bonded and leased his half interest in these claims to Oley Boughton. The bond calls for \$2,000 and the life of the lease is 18 months, during which time the property must be developed to the depth of at least 100 ft. The claims have both produced some high-grade ore from the grass roots to the deepest workings on the property, a 20-ft shaft.

**NEWMARKET.**—This mine shipped 5 tons of concentrates to the Kilton works at Boulder last week and with it went a 14-oz. gold retort, the result of a recent run of mill dirt through the Binford mill.

**WILLIAMS MILL.**—This mill, at Quigleyville, has been turned over to the San Blas Company, and is now busy day and night on the milling dirt from the San Blas tunnel. A trial run of several hundred tons will be made, and if this manner of treating its ore proves successful, the company, it is said, will erect a 20-stamp mill near the mouth of its tunnel.

## CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

**ALIUNDE CONSOLIDATED COMPANY.**—On the Colorado Central vein of this group, at Georgetown, while exploring in the 750-ft. level, a solid streak of ore 30 in. wide and running 252 oz. silver and 20% lead, has been opened.

**CROWN POINT-VIRGINIA MINING COMPANY.**—This property, at Idaho Springs, is owned in New York City. The lode is being developed by shaft and levels. At a depth of 700 ft. it is showing 2 ft. of smelting ore and 3 ft. of high-grade concentrating mineral. There have been no levels run below 460 ft. There has been no pinch of the ore body from the surface and its production in the past has been heavy, but the present management has decided upon development instead of gouging out the mineral, as is the practice in many mines.

**EAST MURRAY.**—P. C. Schull and other Leadville mining men have secured control of this mine at Lawson and are sinking the shaft through country rock to catch the lode on its pitch.

**GERMAN.**—The shaft at this mine has been sunk 600 ft., and for 400 ft. of that depth an ore chute has been showing. Drifts have been run every 100 ft. and there appears to be no pinch. The smelting ore nets all the way from \$25 to \$150 per ton and the mill dirt about \$6 per ton. The mineral carries gray copper, iron and lead.

**GOLDEN CONCENTRATING WORKS.**—M. E. Smith, of the Denver Public Sampling Company, erected a mill at Golden some 12 months ago, but the mine owners of Gilpin and Clear Creek counties failed to ship their product to his works for treatment. As a result Mr. Smith claims that he will tear down the works at once and move them to Idaho Springs, where he has secured control of a big low-grade proposition, the minerals of which he will treat by his modern process.

**JOE REYNOLDS.**—This mine, at Lawson, and owned by the Diamond Joe estate, has been under lease for a number of years, but it is understood that the estate will be settled soon, after which it will be worked by its owners. It is a big producer of high-grade silver ore.

**PAY ROCK.**—In this mine, at Silver Plume, 10 in. of solid high-grade silver ore has been encountered in the lower level. A shipment goes out soon.

**TOLL TUNNEL.**—Clarence Stephens, connected with the Eagle Tube works, with offices on Dey street, New York City, has commenced a big tunnel near Idaho Springs, to cut the lodes of Banner mining district, almost every one of which is owned by Mr. Stephens. The tunnel will cut all of his lodes at a depth of 1,500 ft., and to reach them it must be driven for 3,000 ft. It is 7 x 8 ft. in size, double track and has a drainage box 5 ft. x 20 in. in the clear. The grade is 5 in. in 100 ft. It is being driven by hand at present, but a compressor with air drills will be installed. Mr. Stephens already owning water rights on Clear Creek for power purposes. One blind lead has been cut and it is expected that more will be found, for the lodes of the lower Clear Creek district course in this direction, but are covered up with the slide, so that they have never been discovered in this locality. Mr. Stephens owns 38 full patented claims in the belt to be cut; and as many more which have not yet been patented.

## EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

**ADDER BELL MINING AND TUNNELING COMPANY.**

—Brownell & Company, who are leasing this company's Gold Coin tunnel a few hundred feet east of the Anchoria-Leland, have made an important strike. The tunnel has been driven 40 ft. into the hill and a winze has been sunk 58 ft. Ten feet down the winze they discovered a new vein which assayed \$29 at that point. Sinking was continued and at the depth of 58 ft. a crosscut was driven south 4 ft. where the vein was again opened. They have obtained assays of \$38 and \$61 from a grab sample across the lead. The vein is 5 ft. wide and consists of phonolite and blue quartz.

**COLORADO CITY.**—J. T. Stewart & Company, who are leasing on this property on Bull Hill, have opened a good vein of ore that assays \$350 per ton. The strike was made in the breast of an 80-ft. drift driven from the 200-ft. shaft. In addition to this strike, the men drifting from the 100-ft. level have opened the Los Angeles vein, for which they have been prospecting. The Colorado City is one of the five claims of the Wisconsin group. Negotiations are now pending for a sale of the property to an English syndicate. The present lease has 13 months longer to run.

**DREAM.**—This lode, on Grouse Mountain, opposite the Gold Dollar, is under a long lease. The lessees have done 100 ft. of shaft work and 50 ft. of drifting. Assays have been secured ranging from \$2 to \$23 per ton.

**ESPERANZA GOLD MINING COMPANY.**—This company has let a contract for 50 ft. of sinking on its Louisa E. claim on the east slope of Little Grouse Mountain. The work will be started at once in the old 128-ft. shaft on the claim. The shaft contained 70 ft. of water, which has been taken out. A car load of ore has been hoisted. The shaft is driven on an 8-ft. lead of sylvanite quartz that yields promising assays.

**MOON-ANCHOR GOLD MINING COMPANY.**—Shipments recently sent out from the Moon-Anchor show returns of \$182 per ton for 60 tons of high-grade ore, and about 1½ oz. for 100 tons of low grade. The low-grade ore has been stored of late, owing to the crowded condition of the mills and roads. Two weeks ago 100 tons of this, together with 45 tons of smelting ore, and some valuable sacked ore, were sent out.

(From Our Special Correspondent.)

As the amount of ore daily produced by the Cripple Creek District is constantly increasing in quantity and is being piled up at the dumps or at the different reduction works, capitalists who are looking for investments of the kind do not fail to see the advantage of the construction of more plants for the treatment of these ores, and another mill will before long turn out the precious metal to swell the production of this county. At a point about a mile west of Green Mountain Falls, on the Colorado Midland Railroad, a Chicago syndicate has lately purchased property, where it expects to at once commence the erection of reduction works. Some bodies of low-grade gold ores have been opened in the immediate vicinity and may be profitably worked with this mill close by, the company having purchased about 750 acres altogether. The assay values have shown returns of \$11 to \$17, and a small mill run the result of \$9 per ton.

**COLORADO-PHILADELPHIA REDUCTION COMPANY.**—In addition to their three Ropp straight-line furnaces at Colorado City, this company has contracted for the installation of a 40-ft. Pearce turret roasting furnace.

## FREMONT COUNTY.

(From Our Special Correspondent.)

**LONDON & CRIPPLE CREEK REDUCTION COMPANY.**—Before the Page process mill of this company, at Florence, will start up again it is probable that a large amount of money will be expended on it, increasing its daily capacity and putting in roasting machinery, for which purpose the Pearce turret furnace will be used. Several of the directors of the English company were here a few days ago and were satisfied that by making these changes a successful business could be established. Mr. Page remains the general manager, and Mr. Engelhardt superintendent. Besides the chlorination works, now in course of construction at Florence, by the El Paso Reduction Company, it is said another plant to be operated by that process will be built by the Kilton Reduction Works, which has sampling works and a small chlorination plant at Boulder, so that Florence will shortly have four reduction works for the treatment of the Cripple Creek ores. This, together with its oil and coal mining interests, are gradually making it one of the most prominent industrial points in the West.

## GILPIN COUNTY.

**GOLD COIN MINES COMPANY.**—The annual meeting of this company was held at Council Bluffs, Ia. Messrs. Charles Head and Stephen M. Weld, of Boston, were elected directors, vice Thomas F. Mason, president of the Quincy Mining Company, and W. G. McCormick, of Price, McCormick & Company.

## LAKE COUNTY.

(From Our Special Correspondent.)

**CORONADO.**—As already stated in these columns, these people are preparing for a general resumption. The contracts have been let for the rebuilding of the property that was burned down and this work will be under way in a short time. As soon as completed, the company will place a first-class plant of

machinery on the property and prepare to prosecute development work.

**GRANITE DISTRICT.**—Most of the producing mines of the Granite section are located in Lake County; that is to say, the mines of that section which are at the present time producing or preparing to ship. There is an air of prosperity about Granite this summer that impresses one favorably. Mills are at work, and a great deal of new prospecting is being carried on. The Monte Cristo, operated under lease and bond, shows up well and shipments are being made. The portion of the Magenta lying in Lake County is being worked at a profit. Work has been resumed on the Belle of Granite, and regular shipments will soon be made. On the Bonanza development work is being carried ahead successfully, and occasional shipments are being made.

**LITTLE CHIEF MINING COMPANY.**—The properties of this company are being operated by lessees, and the management of affairs is in the hands of Mr. Austin Blakey. The company owns the Little Chief, the New Discovery, the Little Pittsburg and the Dives claims. On several of the shafts a great deal of work is being pushed ahead, and the lessees are shipping ore. The lessees on the Daly shaft of the Little Chief believe that they have opened up the second contact. They are shipping a small amount of carbonate ore from a streak that they are following, and have during the past few weeks taken out about 70 tons from this streak. This stuff assays 30 oz. silver, 35% lead and a small iron excess. The McRea shaft on the Little Pittsburg is also following a good stringer of ore, and has shipped recently about 100 tons of fine carbonate ore that has averaged \$50 to the ton. No. 6 shaft, Little Pittsburg, is also working, and is shipping from a good iron body. From this shaft about 200 tons of iron have been shipped in the past two weeks. Lessees are also operating the No. 1 Discovery shaft, and are working on an iron body from which they are now taking out about 150 tons a month.

**NEW ELKHORN MINING COMPANY, LIMITED.**—These people are pushing work on their properties and will be heard from extensively during the summer. All eyes are now turned to the new shaft, now down over 600 ft., which is known as the Plumber shaft, and is being sunk with three shifts.

**NIL DESPERANDUM.**—These people have not been doing any work as yet on their strike in this property, but I learn from a very good source that arrangements are now on foot for starting up the mine in a few weeks, and that active development work is to be carried on.

**PLANET MINING COMPANY.**—President August R. Meyer, of the Arkansas Valley smelter, A. V. Hunter and other capitalists are at the head of this company, which was recently incorporated and which will operate the Planet group of claims located on the north side of Evans Gulch, near the new shaft of the Union Leasing Company.

**RAILROAD SPUR.**—The few business men who were opposed to a spur being built from the railroad yards to the outlying mines have ceased their protests, and have made up their minds that if the owners of the big shippers want the road they cannot stop them. And so the matter rests. However, it seems almost certain that just as soon as summer is well under way here the spur will be built, and that instead of having to haul ore under difficulties in wagons, next year all of the hauling can be done in railroad cars.

**SEDALIA.**—A good body of gold quartz is reported to have been struck last week running over 4 oz. gold, but not carrying silver or lead. This material is all silica and is very fine for cyanide process.

**SMEALTER SITUATION.**—There has been but one move in the smelter situation since my last letter and that has been relative to the Bimetallic plant, which has concluded the negotiations on foot and which will blow in one furnace within a very short time. A force of men was put at work this week cleaning up, and, according to manager Ballou, smoke will soon be issuing from one of the big stacks. Additional stacks will be blown in just as soon as more contracts for ore are made. The definite announcement that the Bimetallic is to resume is certainly welcome news, as when the plant is in full operation it employs several hundred men. The plant is equipped with every device for the economic handling of ores and was one of the first, if not the first, smelters in the west which successfully handled pyritic ores.

**STONE.**—This property, on Iron Hill, is coming to the front. A new body of oxide ore has been encountered at the 200-ft. level which assays 15 oz. silver, 35% lead, 35% iron excess and four-tenths of an ounce gold.

**SUGAR LOAF & ST. KEVIN.**—Owing to the late snows these outlying sections are slow in shipping from their producers this year, but it is learned that quite a number of leasers are at work and others intend operating. The weather here has not been at all favorable for early mining, as the frequent snows have made the roads almost impassable in many sections of the camp.

## PITKIN COUNTY.

**OLSON.**—The owners of this lease, on the Mollie Gibson, have a carload of ore ready to ship, which runs from 8,000 to 10,000 oz. of silver to the ton. Besides this rich ore the lessees are taking out a large amount of 600 and 800 oz. ore.



## SAN JUAN COUNTY.

(From Our Special Correspondent.)

**DUKE.**—This mine, on Cement Creek, was recently sold by B. A. Taft and C. S. Reed, of Silverton, and J. C. James, of Denver, to G. M. Barnes and W. T. Lotus, of Denver, for a consideration of \$3,000, one-third of which was paid when the deal was consummated. The workings of the mine consist of a crosscut of 150 ft., which is to be driven 75 ft. further in order to cut the vein.

**INDEX MINING COMPANY.**—This is a new organization with a cash capital of \$1,000,000 which is operating the Index mine, above the Sunnyside Extension, with good success. Over 1,000 ft. of work in drifts and shafts has been done. The ore streak is 18 in. wide and consists principally of gray copper.

**IOWA.**—This property has made an excellent record for itself lately. During December last 2,512 tons of ore were mined, which produced 552 tons of dry concentrates, from which a net value of \$26,029 was realized. In January the production was 3,111 tons of ore, 2,750 tons of which were milled and yielded 750 tons of concentrates, valued at \$27,000. The main vein was cut a short time ago in the third level, which shows larger and stronger than in the other levels. The levels will all be run without stopes until the beginning of the shipping season, in order to open up as much ground as possible. The south drift shows an ore body 500 ft. long without a break in the ore.

**LOOKOUT.**—Lessees have just struck a big vein of fine gray copper running 300 oz. silver per ton.

**MINT.**—This property is owned by B. A. Taft, and is situated in Deer Park. Although but slightly developed, the mine is even now a paying proposition, having 10 in. of rich quartz at the bottom of a 40-ft. shaft. A contract is to be let in the near future for driving a crosscut 200 ft. to catch the vein at the same depth. An offer of \$25,000 was recently made for the property, and is now under consideration.

**VENTURA.**—The various drifts are all in ore, which will not be shipped until the new mill is completed. About 275 ft. of work has been done during the past winter, including a crosscut and drifting both north and south on the vein.

## GEORGIA.

## BARTOW COUNTY.

**CARTERSVILLE MANGANESE AND MINING COMPANY.**—H. C. Stiles, W. F. Parker, E. F. Corey, Wm. Tupper and H. H. Raymond have incorporated this company with a capital stock of \$10,000.

## WALKER COUNTY.

**CHICAMAUGA COAL AND COKE COMPANY.**—This company has closed a contract for the erection of a 100-coke-oven plant to cost \$60,000. The plant may possibly be located at Kensington.

## IDAHO.

## CASSIA COUNTY.

An interesting enterprise in the shape of a gold boat is now in progress on the Snake River, about four miles below Montgomery's Ferry, on the road from Mindoka to Albion. This boat, says the Boise Statesman, belongs to Louis Sweetser and George Burroughs. It has been constructed by and is under the personal supervision of George Burroughs. The boat is 105 ft. long and 20 ft. wide, the extreme length from the nose of the suction to the end of the tailings elevator being 150 ft. The gravel is lifted by a rotary pump driven by a 75-H. P. engine, the suction pipe being 30 ft. long and 12 in. in diameter. There are two other engines, one of which is used to move the boat and the other to drive a scraper and elevator, by which the coarse material is delivered at a point some distance back of the boat. Power is furnished by two 50-H. P. boilers.

The boat is worked backward and forward across the river, the nose of the suction being kept against the bank of gravel, and the boat working up stream. Everything is taken up. The material is mostly ordinary gravel, but occasionally bowlders come through, some of which weigh 50 lbs.

The material thus mined from the bottom of the river is delivered into a sluice on board the boat. The upper end of the sluice is about 6 ft. above the floor of the boat, and the pitch is very steep. The sluice is 80 ft. in length and 4 ft. wide. The gravel is sent over grizzlies, all the coarse material being carried to the end of the sluice, where it is rammed out by a series of steel scrapers running on an endless chain and delivered upon a belt that carries it in back of the boat and drops it again into the river.

The sand carrying the gold drops upon burlap tables. Of these there are eight on each side. They are 15 ft. long and 3 ft. wide, standing at right angles to the sluice and reaching some distance over the sides of the boat. The black sand and gold gathers on and under the burlap. When the tables are cleaned up the concentrates are rocked over copper plates, the gold being amalgamated.

The pump delivers 200 cu. yds. of gravel an hour. The boat has been built over three times. It has been a success from the start, and during the past year it has been greatly enlarged. It would cost from \$15,000 to \$20,000 to duplicate the plant. The operating expenses are in the neighborhood of \$20 a day. At present the boat runs only during the day, but with a force of seven men it could be kept in opera-

tion throughout the 24 hours. Thirteen men are now engaged in gathering fuel. Some are hauling cedar, while others are cutting and baling sagebrush. The latter makes the better fire, but it costs a little more than the cedar.

Mr. Burroughs says there is no other method than the burlap by which the gold can be saved successfully. He has been operating on the river since the spring of 1894, and has the credit of being the only person to make a success of any extensive plant for saving the flour gold that is found in such abundance along the river. The gravel he is working is worth at best only 10c. a cu. yd., and he is greatly interested in the other sections of the river, where the value is said to run.

## IDAHO COUNTY.

**HIYU.**—The report of the superintendent of this mine, in Florence District, states that there is ore enough in sight to run a 10-stamp mill for two years. The work of development is being pushed with 6 men employed. The directors say they will have a mill on the ground inside of three months.

## WASHINGTON COUNTY.

(From an Occasional Correspondent.)

**SEVEN DEVILS DISTRICT.**—The region is now fast opening up from the embrace of winter; prospectors and experts are going in almost daily. The reports on the great copper deposits are all favorable, and some rich samples are being brought out. It is expected that this season's work will settle the question as to the probable extent and permanency of the ore bodies. Many of the prospectors are impressed with the indications of gold east and north of the copper deposits, and some predict that they will prove of much greater value than has been anticipated. However this may be, it is certain that the whole region will be thoroughly prospected this season and more will be known of it than ever before. It is understood that an experimental smelter will be put up soon, whether at Payette or Weiser will depend on the location of the new railroad into the region, which will soon be determined.

## ILLINOIS.

## WOODFORD COUNTY.

**CHICAGO & MINONK COAL AND TILE WORKS.**—A serious labor riot occurred at Minonk on June 8th, where the coal miners have been on a strike since May 1st. During last week a few men have been working against the wishes of the majority. While Superintendent A. J. Morgan and one of the bosses, Joseph Erbeland, were escorting one of the men to work, a crowd of miners interfered. A fight ensued and Morgan and Erbeland commenced to shoot, instantly killing a young miner, and wounding another. This so enraged the miners that they attacked Morgan and Erbeland with clubs and stones, and beat them badly. Morgan died of his injuries.

## INDIAN TERRITORY.

**MORRIS OIL COMPANY.**—A report from Topeka, Kan., says that a syndicate of Chicago capitalists composed of P. D. Armour, Nelson Morris and Geo. M. Pullman has secured control of over 6,000 acres of valuable oil fields in Southern Kansas and Indian Territory, and is making preparations to inaugurate an oil war against the Standard Oil Company. The concern will be known as the Morris Oil Company, of Chicago.

## KENTUCKY.

**JELICO COAL COMPANY.**—Articles of incorporation of this company, capital stock \$2,000, have been filed at Frankfort. The incorporators are A. Gatliff, Jno. W. South, P. T. Mahone and E. T. Halsey.

## BELL COUNTY.

**CANNEL COAL DEPOSIT.**—What is said to be the largest known deposit of cannel coal in the world is on Bear Creek. The seam is 4½ ft. thick, solid, pure cannel coal of very high quality, and free from all partings or impurities and extends over a large area. Kentucky has been noted as the principal source of supply in America for this coal, but the veins are mostly from 12 to 24 in. thick.

**PINEVILLE COAL AND COKE COMPANY.**—This company has filed a deed of assignment, naming J. C. Jones as assignee. The company operated the celebrated Truxton mine and coke ovens, about two miles above Pineville on Straight Creek, which is one of the best mines in the State.

## LEE COUNTY.

**EUREKA-BEATYVILLE COAL COMPANY.**—This company, of Beatyville, has made an assignment to O. H. Pollard, of Jackson, for the benefit of its creditors. The assets and liabilities are not given. This company succeeded the Avent-Beatyville Coal Company in the operation of mines near there.

## MARTIN COUNTY.

**TUG RIVER SALT AND COAL COMPANY.**—At Inez, June 9th, a tract of 20,000 acres of land belonging to this company was sold at public sale, by order of the United States Circuit Court. The property was bought for \$68,000 by Leo Pingel.

## WHITLEY COUNTY.

**MINERS' STRIKE.**—Four hundred miners of the Pine Knot District are out on a strike. The district comprises the Strunk's Lane and Joe Wad mines. The trouble arose over contracts for 1897-98, which were to have been signed May 1.

## MICHIGAN.

## COPPER.

**CALUMET & HECLA MINING COMPANY.**—The directors on June 9th voted to declare a dividend of \$10 per share, which will be payable July 7th to stockholders of record on June 11th. This will bring the total amount paid in dividends up to \$49,850,000. It is the first dividend for the company's current fiscal year, which began May 1st.

**CENTENNIAL MINING COMPANY.**—The work of unwatering Nos. 1 and 2 shafts on the amygdaloid lode at the Centennial mine is completed and a force of miners is at work in the former shaft. Work will be commenced at No. 2 shaft as soon as the necessary improvements are finished. The hoisting equipment is in readiness.

**FRANKLIN MINING COMPANY.**—This company reports the output of copper from its mine during May as 149½ tons, a decrease of ¾ ton from the preceding month, and an increase of about 4½ tons from the output in May, 1896.

**ISLE ROYALE CONSOLIDATED MINES.**—The Marquette Mining Journal says that work will be begun on two shafts at these mines: No. 5 of the old Isle Royale and No. 2 of the Grand Portage. No. 5 shaft is one of the first, if not the first, shafts sunk for mining purposes in Houghton County, and is the deepest of those on the old Isle Royale, having been extended to the ninth level, or to a depth of about 630 ft. It is completely filled with water, in which condition it has been for a number of years, and it will take nearly two months to hoist this.

When the mine was formerly in operation, some 20 years ago, work in No. 5 shaft was confined chiefly to the fourth, fifth, sixth and seventh levels; but little was done in the eighth, while the only opening in the ninth, or bottom, level consists of a drift extending north a distance of about 300 yards. No. 5 shaft is connected with No. 8 by a drift, while the latter shaft is similarly connected with No. 10. The ground between Nos. 5 and 8 shafts has never been opened, being virgin territory.

The rock in former years averaged 1¼%. About 1,200 ft. south of No. 5 shaft, Isle Royale, is situated No. 2 shaft of the Grand Portage, which has a depth of about 400 ft. and is at present half full of water. The shaft is extremely narrow. Some years ago a shaft was sunk at the intersection of the two old mines, which showed a most encouraging lode, but owing to various complications, work had to be suspended. In starting the Isle Royale the new company is fortunate in being able to provide homes for its workmen, there being at least 50 good dwellings on the property recently secured.

**RIDGE COPPER MINING COMPANY.**—Several years ago township taxes were levied in what was called an illegal manner and several mining companies, including this company, refused to pay, although the taxes have since been paid by the others. This spring the Ridge people called an assessment and started to reopen the mine. Meanwhile outsiders bought a tax title on the property, served an injunction on the company to stop work and demanded \$25,000 to settle. This has been refused and the matter has been taken to the courts.

**WOLVERINE MINING COMPANY.**—This company produced 107½ tons of copper at its mine during May, an increase of ½ ton over April, and an increase of 7½ tons over its product in May, 1896.

## IRON—MARQUETTE RANGE.

**LILLIE.**—This mine, at Negaunee, which has been idle for the past 8 months, has resumed operations, giving employment to 200 men.

## MINNESOTA.

(From Our Special Correspondent.)

**MINNESOTA IRON COMPANY.**—The annual meetings of this company and affiliated corporations were held in Duluth June 7th. No changes were made in officers or directors. No plans for the future were discussed for public information, and the deal for the Pioneer mine on the Vermilion, which is by rumor credited to the Minnesota company, was not alluded to.

**ORE SHIPMENTS.**—From Two Harbors, for the month just past, shipments have been 256,000 tons, and from Duluth 288,000 tons, and from Superior about 33,000 tons. This is but little less than for May, 1896, when the movement was unprecedented for that month. For the first week in June shipments from Two Harbors were 28 boats, or about 1,000,000 tons, and the movement is now more free than ever.

## IRON—MESABI RANGE.

(From Our Special Correspondent.)

**BIWABIK BESSEMER COMPANY.**—This company is mining with one shovel and is shipping 75 cars a day to the docks. It has made a sale of 50,000 tons and expects to make others soon.

**COMMODORE MINING COMPANY.**—This company has increased its force and is giving employment to 115 men, and its shipments have enlarged accordingly.

**LAKE SUPERIOR CONSOLIDATED MINES.**—This company has closed the Burt mine of its Hibbing leased group, and will transfer the men from there to the Day, which has been recently leased, \$30,000 being paid in advance royalties. The Day is owned in Minneapolis, and is a very valuable mine. The Burt stockpiles are well filled with ore, and the mine will probably remain closed all season. The proposition of fee holders of the mines embraced in the Lake Superior group at Hibbing, under lease at



25 and 30c. a ton to the Rockefeller company, by which they would reduce royalties as requested by the Rockefeller people if the latter would make a reduction in freight rates, will not be accepted and both fee royalties and freights will remain as heretofore.

**NORMAN IRON COMPANY.**—It is reported that the Minnesota Iron Company, lessee of this mine at Virginia, will abandon it to the fee-holders, under the claim that its ore is not of a grade to sell at the present time at a profit. The lease is 25c. a ton, and the mine is opened on the milling system. It cost the Minnesota \$90,000 four years ago for the lease.

**OLIVER.**—This Carnegie property sent out 200,000 tons last month and will beat this record in June.

**ORE DISCOVERY.**—In excavating for a new grade for the Missabe road, at Virginia, near the Shaw mine's property, a vein of ore was uncovered. It is probably the same ore body that is found in the Shaw and Virginia mines.

**SPARTA IRON COMPANY.**—At this company's mine, the contractors have abandoned the Lidgerwood excavator, they had in use and are working with a steam shovel from the Vega mine. They are making such good progress that they expect to begin shipping ore in about two weeks.

#### SAINT LOUIS COUNTY.

(From Our Special Correspondent.)

**AZTEC.**—W. W. Butchart, Wm. Osborn and E. Faulkner, together with some Chicago men, have begun operations on a copper prospect about a mile from the Duluth City water station, and claim to have excellent indications for high-grade copper. They have named the mine the Aztec, and it was found by the incrustations of copper deposited on shovels left in a well near the spot. Several experts have examined the property.

#### MISSOURI.

##### JASPER COUNTY.

(From Our Special Correspondent.)

**JOPLIN ORE MARKET.**—Nearly all the mines were worked and there was a slight increase in the output throughout the entire district, but the sales were less than the output, leaving a surplus of about 800 tons of zinc ore and 500,000 pounds of lead ore in the district. The top price paid during the week for zinc ore was \$22 per ton, with a general drop of 50c. per ton, except for seven carloads that brought the top price. Lead ore brought \$21 per 1,000 lbs. up to Friday, when there was an advance of 50c. per 1,000 lbs., the closing price being \$21.50, with no indications of any further rise or fall, as the market is not any longer regulated by the price of pig lead in St. Louis, as formerly. According to the St. Louis market lead ore would have been worth only \$18 per 1,000 lbs. last week. The corresponding period of last year zinc ore sold at \$20.50 @ \$21.50 per ton and lead ore at \$17.50 per 1,000 lbs. The increased shipment of zinc ore over the previous week was 241,200 lbs., the decrease in lead ore amounting to 153,580 lbs. Compared with the corresponding period of last year it was an increase of 262,630 lbs. of zinc ore and a decrease of 180,400 lbs. of lead ore.

Following are the sales of zinc and lead ores for the week ending June 5th: Joplin zinc, 1,127,930 lbs.; lead, 164,890 lbs.; value, \$15,306. Carterville zinc, 859,610 lbs.; lead, 205,880 lbs.; value, \$12,815. Webb City zinc, 542,170 lbs.; lead, 46,300 lbs.; value, \$6,494. Galena zinc, 2,810,000 lbs.; lead, 484,940 lbs.; value, \$38,184. Aurora zinc, 583,000 lbs.; lead, 22,500 lbs. value, \$4,515. Carthage zinc, 129,160 lbs.; value, \$1,366. Alba zinc, 124,000 lbs.; value, \$1,302. Oronogo zinc, 113,600 lbs.; lead, 9,540 lbs.; value, \$1,349. Springfield zinc, 85,000 lbs.; value, \$893. Stotts City zinc, 35,650 lbs.; value, \$374. Zincite zinc, 22,660 lbs.; lead, 2,420 lbs.; value, \$289. District totals for last week: Zinc, 6,434,780 lbs.; lead, 936,470 lbs.; value, \$82,887. District totals for 22 weeks: Zinc, 142,596,010 lbs.; lead, 25,994,670 lbs.; value, \$1,802,375.

**FREE COINAGE MINING COMPANY.**—On the company's lease at Midway they are producing from 250 to 300 tons of zinc ore every week. There are quite a number of prospect shafts going down on the lease, but are not deep enough to strike ore, as it is found at about 115 ft. in soft ground.

**H. H. GREGG.**—At his Scotia mine he is hoisting a large amount of top price zinc ore, and last week made and sold 110 tons of \$22 zinc ore. He has a large face of ore and does not have to timber or pump.

**NEBRASKA COMPANY.**—At the mine on the Becky Sharp lease they are drifting at 140 ft. on a large face of pebble zinc ore, and last week made their first turn-in of 10 tons of top price ore.

**NORSWORTHY & PARISH.**—They have developed a rich mine on the Rex Mining Company's land. Last week, with only two men in the ground, they turned in 14,000 lbs. of lead and 15 tons of zinc ore. This rich face of ore is but 85 ft. from the surface and the above output was taken from a space measuring 12 ft. each way.

**POTTER & STILLWELL.**—This firm struck lead ore during the week with their drill on the Rexland, and went through 12 ft. of solid ore. After going through a layer of spar ground they went through 25 ft. of lead and zinc dirt and will sink a shaft on the drill hole.

#### MONTANA.

##### BEAVERHEAD COUNTY.

**BON ACCORD PLACER MINING COMPANY.**—Mr. J. S. Stewart Wallace, of London, president of this company, operating near Bannock, announces that since the feasibility of operating the placers by dredgers has been demonstrated the company had decided to erect a dredge having the capacity to handle 5,000 to 6,000 cu. yds. of gravel every 24 hours, and that it would be ready for operation in September. The dredge, which was described in the *Engineering and Mining Journal* of March 13th, 1897, has solved the problem of mining the bed of Grasshopper Creek, which is deep-bedded and difficult to work by ordinary methods in vogue in placer mining. The property of the company has been proved to be rich by numerous shafts which have been sunk to bedrock.

##### MADISON COUNTY.

**CELEBRATION.**—One of the numerous mining suits growing out of the discovery of the Mayflower mine less than two years ago has been decided in the District Court at Virginia City. It resulted in a victory for the original locators. The property in question was located July 8th, 1895, by Samuel Ayotte, Maxime Lalonde and Fabian Chales, and was called the Celebration. On May 26th, 1896, after the discovery of the Mayflower, it was again located as the Clear Grit by Jesse Johnson and the Knight Brothers. Under the name of the Clear Grit this property, with the Sunrise, an adjoining claim, was bonded recently to W. A. G. Birkin, of London, for \$100,000. He was also supposed to have purchased the lawsuit, but his attorney did not appear at the trial. The decision of the Court in the matter will, of course, affect the deal. Mr. Birkin is now en route to England to obtain money to operate the claims bonded, and it is possible that he may return to work the Sunrise, which is not involved in litigation. The owners will at once proceed to develop the Celebration. The Knight Brothers ran a tunnel into the side of the mountain 120 ft., which will be continued.

**LEITER.**—The force of miners at this mine has of late been gradually increased until now it is working its complement of men. The mill has also begun dropping its stamps and everything at the property is again running full handed.

**MILLER & ROACH PROPERTIES.**—Thomas Noyes has been following a system of development that has given good headway, and, during the progress of this work, 10 tons of shipping and about 140 tons of milling ore have accumulated on the dump. The shipping ore, it is estimated, will net over \$100 per ton, and the milling product will return an average of \$20. It is the purpose of Mr. Noyes to start up the mill in about a week for a run that may be continuous.

##### SILVER BOW COUNTY.

**BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.**—The Anderson mine in the Ground Squirrel District has passed into the hands of this company under lease and bond, the latter, it is said, being in the neighborhood of \$75,000. The deal was consummated a few days ago and the company will at once begin work. There is said to be a good body of ore at the 200-ft. level, and the work will begin there and at the same time the shaft will be sunk from that level downward.

(From Our Special Correspondent.)

**ALEX. SCOTT.**—At this mine, located about one mile east of Butte, preparations are in progress to start sinking the shaft, which is already down 300 ft. New and powerful machinery is ready to start, which the operators expect will enable them to easily handle the volume of water which was very troublesome when work was suspended a few months ago. Some ore has been shipped from this claim which worked over 60% copper.

**ALICE GOLD AND SILVER MINING COMPANY.**—This company keeps its 60-stamp mill running steadily on silver-gold ore which produces about \$20,000 worth of bullion monthly, besides furnishing large quantities of high-grade ore to the smelters. A new boiler has been added to the mill plant. About 150 men find employment in and around the mines and mills.

**ANACONDA COPPER MINING COMPANY.**—This company keeps up the enormous output of about 6,000 tons per day, and is adding to its plant, and developing ground in every direction. At the Buffalo a powerful steam plant has just been completed. At the Never Sweat 5,100 H. P. Berry boilers manufactured by John Mohr & Son, Chicago, are almost completed. The boiler-house is constructed completely of iron and steel, the first of its kind in the district, and contrary to the custom practised here, is not connected to the engine-house, shaft-house, carpenter shop, etc. At the St. Lawrence work on the new hoisting engine is going on steadily. Machinery is also in course of erection on some of the company's silver properties about a mile north of Butte. These mines have been idle for years and the machinery hauled away.

**BIG BONANZA.**—Work has been suspended on this claim. After working out all the pay ore in sight the lessees became discouraged and stopped work.

**BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.**—This company's mines produce about 1,200 tons of ore per day. The plant is being improved and enlarged, a large electric plant is to be added, and a steel head frame or tower placed over the West Colusa shaft. At the Atlantic shaft development work is still in progress, but no ore is

hoisted. The Colusa, Mountain View and Pennsylvania are furnishing the necessary amount of ore, and could produce twice as much if required. The large shaft at the West Colusa is down to the 700-ft. and the work of enlarging from the 600-ft. to surface is progressing rapidly. Calorimetric and efficiency tests are in progress at the boilers, engines, pumps, etc., and the management is supplementing practical experience with all that engineering ability and science can suggest.

**BUTTE & BOSTON CONSOLIDATED MINING COMPANY.**—This company is steadily developing its properties, over 100 men being employed in this work at the East & West Gray Rock, Blue Jay, Harrington Placer and Silver Bow.

**COLORADO SMELTING AND MINING COMPANY.**—This company is keeping its smelter well supplied with ore from the Gagnon & Nettie mines. It is also developing the Old Glory & Betsy Dahl claims which are now producers at present.

**INCLOSED MINE CAGES.**—The new law requiring encased or inclosed cages in mines of a certain depth went into effect June 1st. Many of the mines of the district are already equipped with inclosed cages, and the law will generally be complied with.

**MONTANA ORE PURCHASING COMPANY.**—At the Rarus the usual quantity of ore is hoisted, and also at the Glengarry. It is reported that the shaft of the latter, which has now 400 ft. of water in it, will be pumped out and considerable development work done on the bottom. At the Nipper sinking is in progress below the 250-ft. level.

**PARROT COPPER MINING COMPANY.**—This company is producing its usual amount of ore, 400-500 tons per day, from the Parrot mine, and a few men are at work breaking ore at the Moscow. At the company's new smelter at Gaylord about 130 men are at work. It is expected that the smelter will be completed in a few months.

**W. A. CLARK'S PROPERTIES.**—At the Colusa Parrot the crosscut on the 1,200 ft. level has just cut the vein, which was 60 ft. wide on the bottom of the 1,100-ft. At the Original the shaft is down to the 1,000-ft. level, where the vein will be exploited before sinking any deeper.

**WASHOE COPPER MINING COMPANY.**—This company, it is reported, will soon commence to build a smelter. In the meantime it is opening up the Moonlight, Stella and Poulin mines. At the Poulin drifting is in progress on the 600, 800, and 1,200-ft. levels. At the Stella they are sinking from the 800 to the 800 ft. level.

#### NEVADA.

##### ESMERALDA COUNTY.

**SILVER PEAK.**—A contest appears to be in progress over the title to this mine, if despatches from Hawthorne are to be trusted. For some time past the mine has been worked under a lease and bond obtained by L. J. Hanchette from John I. Blair, of New Jersey, the owner. It is claimed that the purchase price has been tendered and refused. It is now claimed that Messrs. Hague and Wombie sought to make an examination of the mines, and Mr. Hanchette has had these two experts arrested on a charge of breaking into the property without authority. A suit is already pending over the Hanchette bond.

##### STOREY COUNTY—BRUNSWICK LODGE.

**CHOLLAR MINING COMPANY.**—The report of operations for the week ending May 29th is as follows: Shaft No. 1 was sunk 12 ft. on the incline; total depth 919 ft.; the bottom is in porphyry showing some quartz. 300-ft. level—Have started a winze 110 ft. south of the north line, in which there is a streak of good ore in the bottom. 400-ft. level—Have been working on the 7th and 8th floors; the grade of ore has been a little higher than for the previous week. 500-ft. level—Advanced the main south drift 30 ft.; total length 380 ft.; the face is in porphyry and seams of quartz, from which they get low assays. 600-ft. level—Advanced main south drift 40 ft.; total length 85 ft.; the face is in porphyry and bunches of quartz. They are doing a great deal of prospecting throughout the mine. They shipped to the Nevada mill during the past week 265 tons of ore, sampling as follows: Car sample, \$21.78 gold and 20.05 oz. fine silver; wagon sample, \$20.69 gold and 21.92 oz. fine silver; battery sample, \$20.55 gold and 18.40 oz. fine silver per ton. Have shipped to the United States Mint two bars of bullion, the par value of which was \$8,359, \$3,842 of it being gold.

**SEGREGATED BELCHER & MILES CONSOLIDATED MINING COMPANY.**—At the annual meeting in San Francisco last week the stockholders re-elected the old management, with Thomas Anderson as president, E. B. Holmes, secretary and W. E. Sharon, superintendent.

##### STOREY COUNTY—COMSTOCK LODGE.

**CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.**—The official report for the operations ending May 29th is as follows: 1,000 level—The west crosscut has been advanced 38 ft., passing through soft porphyry, clay seams and lines of quartz; total length, 293 ft. 1,550 level—The double compartment incline upraise No. 1 has been carried up along the footwall 16 ft.; total height, 98 ft.; top of opening in porphyry with quartz assaying \$1.50 per ton. 1,650 level—From the ninth floor south drift the upraise has been carried up 8 ft., passing through a quartz formation assaying \$1 to \$4 per ton; total height of 41 ft. From incline upraise No. 1 which has



been carried up on the footwall 9 ft., passing through ore showing an average width of  $3\frac{1}{2}$  ft.; total height above the sill floor, 40 ft. Our opening in the top shows a length, north and south, of 10 ft., and a width of  $3\frac{1}{2}$  ft. of good ore. The average assays from the west and north faces is \$47.83 per ton. In the south face the average is \$60 per ton. We have worked south 11 ft. from the upraise at a point 30 ft. above the sill floor, where the ore averages \$60 per ton. We have extracted from this point to the north drift from No. 2 upraise 115 tons of ore, assaying per mine car samples, \$76.86 per ton. A north drift started from No. 2 upraise, at a point 35 ft. above the sill floor of this level, has been advanced 14 ft. The first 4 ft. passed through porphyry and quartz assaying from \$5 to \$20 per ton, and the last 10 ft. passed through an ore streak 2 ft. wide, assaying \$75 per ton. In the face of the drift there is a clay slip dipping downward to the north, which cuts off the ore in that direction. The total extraction of ore for the week amounted to 115 tons, the average assay value of which, per samples taken from the cars when raised to the surface, was \$74.22 per ton.

## TUSCARORA COUNTY.

(From Our Special Correspondent.)

**DEXTER MINING COMPANY.**—The officers of the Dexter mine, located in Tuscarora, have discovered robberies of amalgam on a large scale, and, as a result, James W. Linnell, president and general manager of the company, is under arrest. The Dexter is a Utah corporation, the owners being the members of the legal firms of Dickson, Ellis & Ellis and Booth, Lee & Gray, of Salt Lake City. Linnell had no means when he took charge of the Dexter, and his only income was his salary, but he has sums deposited to his credit in banks in Salt Lake City, in Elko, Nev., and in the Anglo-California Bank, of San Francisco, each in excess of the total amount received from the company. Two of Linnell's subordinates were in his secret, and on being charged with collusion admitted the facts. Linnell began his speculations last September, and kept the proceeds in sacks under his bed until \$2,650 was accumulated. This was sent to Denver in November, and sold. During February, another consignment, valued at \$400, was sold in Denver. Linnell attempted to cover his tracks by reporting a lighter tonnage milled than was actually treated. It is believed that his stealings amount to over \$25,000. On May 29th Linnell was arrested on a complaint sworn to by Judge W. H. Dickson, and was immediately released on bail, whereupon he caused the arrest of attorneys E. O. Lee and A. C. Ellis, Jr., of Salt Lake City. They were acquitted at the preliminary examination. Linnell's specific charge that they had stolen \$750 in amalgam from his bedroom being disproved. A second warrant for Linnell's arrest was transmitted to the sheriff by telephone from Elko, and this Linnell declined to submit to. While the matter was being adjusted, he and his two confederates left Tuscarora secretly. The sheriff and his deputies captured the fugitives after a chase of 25 miles and they are now in custody. Linnell is well connected and the developments have occasioned much surprise among his former associates.

## NEW MEXICO.

## BERNALILLO COUNTY.

**BLACK GIRL.**—This mine, in Cochiti district, has over 30 tons of ore on the dump, and production continues.

**CANADA DE COCHITI.**—On May 24th the Supreme Court, in an opinion rendered by Justice Brown, reversed the opinion of the court of private land claims in the case of Joel Parker Whitney vs. the United States, involving title to the Canada de Cochiti grant, containing 104,000 acres. The court concluded that the land court erred "in locating the western boundary by the pueblo of Cochiti and that it should be extended westward to the nearest sierra or other natural object that bears the name of Jemez," but that the holding of the court below as to the northern boundary line was correct. The range of mountains known as the Jemez extend to a point almost directly west of the Mexican village of Canada, near which is the north line of the grant as established by the land court. This village is nearly seven miles south of Bland, the center of the Cochiti mining district. Thus it will be seen that all the mines and prospects in this district are entirely free of any conflict with the grant just settled.

**COCHITI OPAL PROPERTIES.**—The opals occur in a matrix composed of tufa, and sometimes a conglomerate of scoriaceous or volcanic matter. The indications are that large deposits of the gem exist, chiefly in that part of the district lying from the lower Colla canyon west to the lower end of Peralta canyon, and separately on the east of the main mineral belt. The principal opal claims are the property of William D. McCoy, of Bland; the Schuman Brothers, of Santa Fe, and H. B. Cartwright, also of the latter place. Judge Oaks, of Albuquerque, also owns several interests in opal claims, being one of the original discoverers of the gem.

**PORTLAND.**—Work will soon begin on this property in Colla canyon, Cochiti district, belonging to Messrs. Finch, Hofheins and Ed Smith, and which has been leased and bonded to another party.

**SANTA BARBARA EXTENSION.**—The Leyba Bros. will soon begin work on this claim, one of the best properties in Colla canyon, Cochiti district, and which has a 5-ft. vein of well mineralized quartz.

## GRANT COUNTY.

**SILVER CITY SMELTING AND REDUCTION WORKS.**—These works have been closed down to make changes, so that lead ore can be smelted as well as gold, silver and copper ores.

**TREASURE MINING COMPANY.**—Crushing and concentrating has begun in this company's mill, which has been remodeled and new machinery put in. The ore will be concentrated and amalgamation dispensed with. The value in the ore is saved to a high percentage, but little being found in the tailings by assay tests made. The shaft upon the Atlantic mine, which this company is working, has now attained a depth of 350 ft. being 50 ft. below the 300-ft. level. The shaft will be sunk to a depth of 425 ft. as rapidly as possible, at which place drifts will be run.

## TAOS COUNTY.

**DALLAS MINING COMPANY.**—This company had three surface assays made from the Lost Hope, which, it is said, gave \$6 at 12 ft., \$12 at 15 ft., and \$28 at 30 ft. It is situated about 3 miles down Red River. It has a 3-ft. lead.

**HENRIETTA.**—This claim, owned by Henry Tier-tag, has development work, consisting of 40 ft. tunnel and 30 ft. shaft. A recent assay gave \$26.

**JAYBIRD No. 1.**—Two shifts are at work on this claim, near Road canon, running a drift. About 20 ft. have been put in and a good lead found. Brandenburg, Sumner & Keen are the owners.

**PIONEER TUNNEL AND MINING COMPANY.**—This company's property, in Pioneer Gulch, comprises over 100 acres and is the oldest tunnel location in the Red River district. Three leads have been opened up, and the tunnel is being run to crosscut them. A force of men is now at work, and an ore body is being opened up.

**RAGGED PANTS DICK.**—A recent assay of the ore from this claim gave a very high value. The property was recently sold by R. W. Penn and T. R. Nelson, the original locators, for \$5,000, to parties in Colorado Springs. It is situated about 2 miles from Red River in Road canon.

**RED RIVER MINING AND INVESTMENT COMPANY.**—The Edison mine, near Midnight, probably the largest producer in Red River District at the present time, was recently bonded by the above company, and a large force of men have been put to work developing the property, taking out ore, etc. Shipments are to be made via Antonita. This company has also bonded several other properties and has them well under way.

## OREGON.

## JOSEPHINE COUNTY.

**OLALLA.**—The owners of this mine propose to put in an hydraulic elevator, rendered necessary by the lack of dump facilities. It is also said that a two-stamp mill, with rock crusher, will be erected to test the ores found in the neighborhood.

## PENNSYLVANIA.

## ANTHRACITE COAL.

**LEHIGH & WILKES-BARRE COAL COMPANY.**—It is reported that General Superintendent E. H. Lawall, of this company, confirms the correctness of the announcement that, commencing July 1st, all the mines of this company will work full time. The company employs 8,000 men and boys.

## BITUMINOUS COAL.

The committee which investigated the condition of the miners of the Pittsburg, Cambria and Clearfield districts presented its report to the legislature this week. Among the recommendations made by the committee are the following:

That the miner be paid for all coal in the car at the mine or tippie before screening, and that use of the screen for ascertaining the wages due the miner be abolished; that 70 lbs. be deemed one bushel of coal, and 2,000 lbs. net shall be deemed one ton, and that the miner be paid on this basis, and that all laws on this subject be so amended as to provide and make it a misdemeanor punishable with fine or imprisonment for any violation.

That the present law authorizing the appointment of check-weighmen by the miners be enforced, and that the check-weighmen selected by the miner shall be subject to the jurisdiction and control of the factory inspector in whose district such mine is located, instead of the mine inspector, until such time as a bureau of mines and mining may be established by the State.

That the laws relating to the semi-monthly pay days be enforced and if unconstitutional or inoperative by reason of their provisions, that they be so amended as to make them constitutional.

That the company store be abolished and a law passed which would prohibit any individual, firm, corporation or association engaged in the mining of coal from being interested directly or indirectly in such store where goods, wares and merchandise are sold or exposed for sale, or operating or carrying on any store in which the miners employed by such individual, firm, corporation or association deals. Also, prohibiting the use and issuing of coupons, check cards or any other device or thing calling for the payment of money to be used in the purchase or exchange of merchandise for labor.

That an act be passed against the overcrowding of tenement or other houses and keeping the same in an unsanitary condition.

With regard to the request of the miners for the passage of a law which would prohibit an individual operator from preventing a miner from joining a

labor organization, the committee is of the opinion that a law of this kind, so far as the individual operators are concerned, would be unconstitutional and inoperative, it not being within the province of the law-making power to pass it. So far as such a law affecting corporations is concerned, the present Legislature has already passed a bill covering the subject, and therefore any recommendation is unnecessary.

## SOUTH DAKOTA.

## CLARK COUNTY.

**STEARNS GROUND.**—Blatchford & Company, lessees of this property at Garden City have made an important strike of a large body of high-grade free, milling ore at a distance of 200 ft. from the mouth of the tunnel.

## LAWRENCE COUNTY.

A large plant for the reduction of refractory ores by the new electro-cyanide process, has been begun at Anna Creek, near Deadwood. The mill will have a capacity of 100 tons a day, and it is expected to turn out at least \$95,000 in gold per month. It will handle nearly all the ores of the Anna Creek district for some time.

**URANIUM ORE.**—It is reported from Deadwood that an old German named Davier has been at work on claims near that city developing, as he asserted, a mine of uranium. He has sent samples of the ore to mills in the United States and to some in Europe for the purpose of satisfying himself that the metal was uranium. Now he has received a report verifying his expectations.

## TENNESSEE.

**AMERICAN JELICO COAL AND COKE COMPANY.**—John Bane and associates have applied for a charter at Knoxville for this company to mine coal and erect coke ovens.

**SOUTHERN JELICO COAL COMPANY.**—It is reported from Knoxville that a deal has just been made which involves the transfer of the greater part of East Tennessee coal lands. The consideration is to be between \$4,000,000 and \$5,000,000. The mines and lands in the Jellico Coal Creek, Poplar Creek and Middlesboro, covering 100,000 acres, are included. These mines have a yearly output of 2,500,000 tons of coal and employ 3,500 men. The company promoting the deal is the Southern Jellico Company, a Tennessee corporation, most of whose stockholders are from Boston. They have succeeded practically in floating an issue of \$5,000,000 of bonds in England, and the agent of the prospective bond purchaser, Mr. A. Taylor, is now on his way to this country to inspect the property and close the deal. Whether bonds are sold or not, however, the property will change hands, and the new company will make extensive improvements.

## HAMBLEN COUNTY.

**STANDARD ASPHALT COMPANY.**—This company will develop its asphalt mines near Russellville.

## WHITE COUNTY.

**DIAMOND OIL COMPANY.**—The stockholders of this company held a meeting at Sparta, at which it was decided to proceed with the drilling of the company's well on the farm of Charles Hastings, 6 miles south of that place. This well is now 500 ft. deep, with a strong flow of gas.

## UTAH.

(From Our Special Correspondent.)

In the general situation of the silver-lead camps there is no improvement from last week. The large producers are still curtailing their output. Mills are being closed and the working forces underground reduced. At Tintic the talk of a local smelter, that began a month ago as a sort of shot in the dark, is assuming something of a more tangible form. About everything needed for successful lead smelting is there at hand. While nothing definite can be learned, either from the smelter or railroad offices, the impression quite generally prevails that new treatment and freight schedules will be announced by the middle of the month, or soon after. If this is not done the outlook for the silver-lead districts, that have made Utah famous, will be dark for the remainder of the year.

**SHIPMENTS FROM SALT LAKE CITY.**—During the week ending June 5th, there were shipped East 25 cars, 861,937 lbs., lead-silver bullion; 2 cars, 89,820 lbs., copper bullion; and 27 cars, 545 tons, lead-silver ore.

## JUAB COUNTY.

(From Our Special Correspondent.)

**BUCKEYE.**—A new ore chute has been broken into in the bottom of the shaft, exposing 3 ft. of ore assaying  $5\frac{1}{2}$  lead, 60 oz. silver and \$10 in gold. The property is near Silver City.

**DEEP CREEK RAILROAD.**—The announcement by Hon. George O. Cannon, president of the Utah & California Railway (projected), that this company will build into the Deep Creek region, and that one of the Tintic towns where connection is had with the Oregon Short Line and Rio Grande Western railways will be the initial point, is regarded locally as the most important piece of news yet made public in relation to the proposed railways west from Salt Lake City. The fact that the projectors have determined to utilize one or both of the lines from Salt Lake to the Tintic camps, instead of constructing 80 miles of third line, is regarded as significant of an intention to commence early construction. The mining men of the State are enthused over the change in the programme, as they



believe a smelter in one of the Tintic towns, preferably Robinson, has long been a necessity. In that neighborhood is an abundance of smelting ores and immense bodies of lime and the best fluxing iron in the West Tintic, 20 miles westward, and on the line of the proposed road extensive bodies of lead ore have been developed. The route is also located through a country that will supply a considerable quantity of charcoal timber.

**GODIVA.**—The report recently published that Jesse Knight was about to purchase this property is denied by the *Tintic Miner*. Mr. Knight is the owner of the Humburg, which made such a phenomenal showing of ore last year, and afterward purchased the Uncle Sam and other adjoining property. The Godiva adjoins these, but the owners have no intention of selling the mine and will continue its development.

**GRAND CENTRAL.**—Rich gold ore is being extracted, the actual value of which is carefully guarded. It is being sacked and shipped under guard, which gives ground for the belief that it is of more than common value.

**TINTIC SHIPMENTS.**—For the week ending June 5th: Bullion-Beck, 17 cars; Centennial-Eureka, 5 cars; Eureka Hill, 7 cars concentrates; Uncle Sam, 6 cars; Ajax, 5 cars; Swansea, 4 cars; South Swansea, 6 cars; Northern Spy, 1 car; Morning Glory, 1 car; Grand Central, 1 car.

## PIUTE COUNTY.

(From Our Special Correspondent.)

**BEECHER HILL MINES.**—Joseph Brethwaite and Frank Wright, of Marysvale, have for a number of years been developing a group of four claims, and last week broke into a vein of silver-lead ore, at a depth of 450 ft. An upraise was driven and a chute of ore from 4 to 7 ft. wide opened, which assays 70% lead and over 100 oz. silver. This is the most important find of lead ore yet made in the Ohio district.

**CRYSTAL GOLD AND SILVER MINING COMPANY.**—This company owns a group of 25 claims near Marysvale, in which two strong parallel veins are well developed. The values are lead, silver and gold, but the mineral is mixed with the gangue, making it a concentrating proposition. Experiments are now in progress to determine a satisfactory treatment, and upon the result depends the erection of a large concentrator. The officers and directors are George M. Scott, president and treasurer; J. E. Galigher, vice-president; H. S. Rumfield, secretary, all of Salt Lake City; E. M. Burns, of Herkimer, New York and B. B. Van Deusen, of Iliou, N. Y. The company is capitalized for \$1,000,000 in \$10 shares.

**GOLD QUEEN.**—The property is in Gold Mountain district and is owned by H. W. Ramlose, George T. Bean and Hyrum Hanson, of Richfield. A tunnel has been driven 110 ft. to the vein which is 4 ft. wide at the point intersected and carries \$10 in gold. Work has been started on another tunnel lower down the mountain, which will cut the vein at a depth of 300 ft. from the apex, and which, it is expected, will cut a separate vein overlying the other.

**SEVIER-SURPRISE.**—One of the most important mining transfers in the annals of the West is about closed. Prof. George W. Maynard, assisted by Martin J. Heller, a young metallurgist of California, is examining the Sevier, Surprise and adjoining ground for a New York syndicate which has an option on a large and valuable tract. It is an open secret that the sale, which means the expenditure of over \$500,000, will be consummated next week. John G. Logan, who brought the Winnamuck back to life, first examined these remarkably strong fissure veins, securing options on the different claims for the probable new owners. Professor Maynard is checking him up, and the numerous ore faces and conditions generally are fully holding good all that was promised. Already a telephone line from Salt Lake and a post office are spoken of as happenings of the near future. There are great expectations, and if a fair portion are realized one of the most notable low-grade gold properties will be this Gold Mountain consolidation.

## SALT LAKE COUNTY.

(From Our Special Correspondent.)

**FRISCO.**—This is one of the oldest producers in Carr Fork, Bingham. A winze recently sunk from the lower tunnel encountered a good chute of sulphide ore and on this a depth of 130 ft. has been reached. A steam hoist is now being installed and is intended to go to a depth of 500 ft.

**OPHIR.**—The Ophir group comprises two full claims, the Ophir and Elsie, along the strike of a vein in the Bingham gold belt, owned by William A. Robertson, of Salt Lake City. Two shafts, 160 and 180 ft., and a crosscut tunnel 320 ft. to the vein, which averages 3 ft. between a lime hanging and quartzite foot wall, make up the development. Since the disappearance of snow active work has been resumed and a good grade of gold ore is being produced. About 100 tons were marketed last year, the gold values ranging from 1.8 oz. to 3.5 oz., the average of silver and lead being about 4 oz. and 6%.

## SUMMIT COUNTY.

(From Our Special Correspondent.)

**DUTCH CANYON.**—Active prospecting is being prosecuted where the Valeo mine was discovered last year, in which a valuable copper vein, carrying important gold values, was opened and is now producing. The region is about 8 miles southeast of Park City, and while the surface shows evidence of mineralization but little prospecting has been done.

**PARK CITY GOLD DISCOVERIES.**—A great deal of excitement has been created by the very recent discovery of two distinct and well-defined gold ledges in this old silver camp. The first discovery was of a ledge of iron-stained quartz on the Constellation ground, which was about 6 in. wide on the surface, but in a depth of 24 ft. widened to 4½ ft. From the surface down the ledge was given an average value of \$14.72 gold and 6 oz. silver. The second ledge was discovered also on Constellation ground, but about 50 ft. west and lying parallel to the first. It is much larger on the surface, being 2 ft. thick, but not enough work has been done to determine values or extent. It is believed the two veins converge in the ground of the Waneta, which lies between the Constellation and the Ontario, and is owned by the Utah Mining and Development Company. Through the end lines of the Waneta the quartz ledge has been traced the entire length of the claim and whenever the shallow workings have exposed the ledge it has been found heavily impregnated with manganese, which it is believed carries the gold values. Assays run from \$14 to \$48 in gold. Beyond the Waneta the ledge has been traced into the American Flag, where the most important developments have been made. A shaft had been sunk to a depth of nearly 200 ft. and with the discovery of the gold ledge a drift from the bottom of the shaft cut the gold ledge. Here the vein was filled with manganese and of a series of assays the lowest gold content was \$89, the highest \$160. The ledge is a contact between lime and quartzite, and in the vein porphyry and talc form the gangue. No rush can follow as the area is nearly all under old locations, but active development work has been commenced on all properties near the finds. The present indications point to the opening up of an important gold belt in a region where it was least expected.

## TOOELE COUNTY.

(From Our Special Correspondent.)

**SILVER LODGE MINING AND MILLING COMPANY.**—One-half of the capital stock, or 50,000 shares, has been sold to Kilpatrick Bros. & Collins, the railroad contractors of Beatrice, Neb., and Weston & Cooke, bankers of the same place, by John Dern and E. H. Airis. The consideration is not released. The property is located above the Marion-Geyser in Mercur, and within its limits both the gold and silver ledges are exposed. A force has been put to work sinking an incline on the gold ledge, and a vertical shaft is started to crosscut the formation. The company will be reorganized at once, with John Dern, E. H. Airis and George Dern, of Salt Lake, and two of the Nebraska men in the directory.

**WACHUSETTS.**—Located on the top of Lion Hill in the Ophir district, near the Northern Light, and adjoining the Chloride Point, is this property, consisting of two claims, just purchased by John Dern, E. H. Airis, Gil. S. Peyton, H. W. Brown and L. C. Clark, all excepting the latter being the original developers of the Mercur. The new owners have a big force at work opening up the ore which carries silver values from 50 oz. up. About one-third of the average value is gold.

## VIRGINIA.

## LOUISA COUNTY.

**ARMINIUS.**—This mine, the oldest of the sulphur mines, has been worked steadily for many years. There is a large per cent. of copper in the ore. At present some 200 tons of sulphur ore are shipped from this mine.

**SMITH LENNIG.**—This sulphur mine, adjoining the Arminius, is not now being worked; but preparations are being made to put in a plant of modern machinery and put the ores (of which there are two veins) on the market.

**VIRGINIA PYRITES.**—This mine, which is also a sulphur mine, and is on the same vein adjoining the Virginia company's property on the north, is not now running on account of some litigation. It has a good plant of machinery and a shaft about 400 ft. in depth.

**VIRGINIA SULPHUR MINES COMPANY.**—The Jenkins mine is owned by this company. The veins of sulphur ore run from 20 to 45 ft. wide. They have four to five shafts and are shipping some 200 tons daily on their standard branch railway 4 miles long, connecting with the Chesapeake & Ohio Railroad at Mineral City. This mine employs a large number of hands, and is increasing its output.

**WALTON.**—This gold mine, which has been in litigation, has not been running for some years. New machinery was recently put in and it may start up soon.

## WASHINGTON.

## STEVENS COUNTY.

**IRON KING MINING COMPANY.**—This company, operating in Cedar canyon district, which sold 120,000 shares of treasury stock, recently reports a strike of native silver distributed through white quartz at a depth of 30 ft. The property is an iron cap, and the silver was found directly underneath. Mr. Pugsley reports that another contract for 70 ft. more of work has been let. Four men are at work.

## WEST VIRGINIA.

## BARBOUR COUNTY.

**PHILIPPI COAL MINING COMPANY.**—John Kerr and J. C. Menoher, of Greensburg, Pa., in company with several capitalists of West Virginia, have just

purchased a large tract of coal land in the vicinity of Philippi, and have applied for a charter for the above company. The development of the tract of coal will begin at once. Among the West Virginia people interested are Hon. A. G. Dayton, C. F. Teeter, James E. Hall and others.

## BERKELEY COUNTY.

**GEORGE R. SHERIFF COAL COMPANY.**—A charter has been issued to this company, of Martinsburg, incorporated by Washington parties, with a capital stock of \$100,000.

## MARION COUNTY.

**PITTSBURG & FAIRMONT OIL AND GAS COMPANY.**—This company, with a capital of \$2,000,000, has been chartered at Fairmont by John C. Gould, C. F. Wilson and others.

## FOREIGN MINING NEWS.

## BRITISH COLUMBIA.

## KOOTENAY DISTRICT.

**ARGO.**—A final payment of \$13,000 cash has been made on this property, which is located near Sandon and was owned by John A. Whittier, J. Thompson, William Sudrom and Alexander McDonald. The work of active development has now commenced. So far more than 300 ft. of development work has been done. There is 3 ft. of solid ore on the property.

**STAR.**—This mine, at Ainsworth, is showing up well under development. At present there are 18 in. of clean galena in the breast which gives average assays of \$61 in silver and lead. The company owning the property proposes to sink the shaft 25 ft. deeper and then commence stoping. Recent assays show iron pyrites carrying \$4 in gold. If found practicable the company will put in a dry concentrator.

## SLOCAN DISTRICT.

**TORONTO GROUP.**—Captain Thompson, manager of the Wonderful, has purchased from D. M. Bongard and others, of Slocan, a group of four prospects, the Toronto, Auditorium, St. Paul and Minneapolis. These claims are undeveloped and lie northeast of the Payne group, with only a fraction between. They are about 1¼ miles from McGuigan.

**TWO FRIENDS MINING COMPANY.**—At the annual meeting of this company, held in Vancouver on June 1st., all the old board of directors were re-elected and O. Plunkett was added to the board.

(From Our Special Correspondent.)

There is a steady reaction in this portion of the Kootenay country. A number of mining brokers of Rossland, who have found the Rossland field too much occupied for their line of business, have moved to Kaslo, Sandon, Slocan City and other points in the upper country, where a favorable reaction has set in.

**SHIPMENTS FROM KASLO.**—For the week ending May 29th there was shipped from Kaslo 212 tons of ore. The greater portion went to the smelter at Everett, Washington. The shipments of the Rambler Cariboo were 30,000 lbs. for the same period, and included in the above were made to Tacoma. The Washington during the same period shipped 32,000 lbs. to Omaha smelter.

## TRAIL CREEK DISTRICT.

(From Our Special Correspondent.)

**DUNDEE.**—The wagon road to this property is 2¼ miles by actual measurement, instead of 1½ miles, as recently stated. The shaft is now down 100 ft., and the wagon road having been completed, the management is waiting for the machinery which is now ordered. Work on the foundation for the engine and boiler has, however, commenced. On the Parker group of this property, where the shaft is sunk, the surface assays showed only \$2 in gold, but these values have gradually increased with depth. At 13 ft. the value was \$12; 60 ft., \$22 in gold and 2 oz. silver; 80 ft., \$34 in gold and 9 oz. silver; 100 ft., \$56 in gold and silver. The vein is 15 ft. wide between the walls. On account of it having the appearance of a true fissure, Mr. J. L. Parker, mining engineer, of Rossland, reported favorably upon it to a party of friends, who subsequently formed the present company. Mr. Parker is now the superintendent.

**FLOSSIE L.**—This property is between Red and Spokane mountains about 2,000 ft. south and below the Jumbo, the mineral claim Gold King lying between. The situation is very favorable for working. A good road connects with the Jumbo mine road, about 200 yds. distant. The development work consists of two tunnels, Nos. 1 and 2, in about 150 ft. each, with a shaft in from the surface to the latter of about 40 ft. Tunnel No. 2 is a good working one well timbered. The rock in both tunnels is principally a diorite fairly mineralized, but as yet no appreciable ore body has been found in either tunnel. There are two ledges on the property which have a good showing of the Iron Hat. A force of 18 men was at work on this property until very recently, but the force is now reduced to about seven men, but it will be increased early next month. The property has for some time been bonded to an English syndicate, one of the conditions being that the sum of \$12,000 was to be expended on the claim developing it. Of this sum about \$2,000 has already been expended. The headquarters of the proprietary company are at Spo-



kane, the following named being the officers: Cyrus Happy, president, Spokane; Harry L. Rogers, vice-president; W. G. Tanner, secretary; Mr. Langford, treasurer; Harry S. Jones, superintendent. The capital stock of this company is \$500,000. Of this two-fifths represent heavy stock. The necessary cabins and workshops have been erected.

**KEYSTONE GROUP.**—In a recent issue the secretary of the company was improperly given. It should have read Mr. J. A. Belford. The vein on the Blackstone, which is one of the group, should have been given as 7 ft. wide instead of deep. It lies between granite and porphyry walls. That on the Keystone is a different one, being considered the main one. It is the full width of the shaft. As yet no crosscut has been made to determine the width of this vein. The shaft is 36 ft. deep. This is to be sunk 100 ft. and then crosscut.

**LITTLE DARLING.**—This property is adjacent to the Flossie L. and is owned by the parties who have bonded that property. The surface showing and the location are very favorable. Work will begin next month under the direction of Harry S. Jones, the superintendent of the Flossie L.

#### MEXICO.

##### MICHOACAN.

**RIO TINTO.**—It is reported that this copper mine has been sold to a European syndicate. It is claimed to be a rich copper mine, and the new owners will erect a smelter at the mine with a capacity for treating 1,000 tons of ore per day. The amount involved in the purchase of the mine and erection of the smelter is given as \$3,000,000 gold. An English company recently invested \$400,000 gold in another copper mine in the State of Michoacan.

##### SONORA.

**CHIPIONA MINING COMPANY.**—This company, with principal office at Midland, Tex., has been chartered to carry on its business especially near Ures; capital stock, \$25,000; purpose, to do a general mining business in the republic of Mexico and State of Texas. Incorporators: F. Divers, John M. Cowden and Robert Bartlett, all of Midland.

#### NEW SOUTH WALES.

The New South Wales examiner of patents, at the instance of the parties opposing the application for the amendment of the MacArthur Forrest cyanide patent, has extended the time for filing evidence till June 26th.

#### SOUTH AFRICA.

##### TRANSVAAL.

**SHEBA GOLD MINING COMPANY.**—This company recently increased its capital stock from £850,000 to £1,100,000. The money obtained was used to provide additional working capital and to purchase the Zwartkopje property, which adjoins the Sheba. For the month of April the company reports 60 stamps working and 4,800 tons ore crushed. The product in gold was: From mills, 3,940 oz.; from tailings by cyanide, 1,220 oz.; from concentrates, 1,115 oz.; total, 6,275 oz., or 1.37 oz. per ton crushed.

#### SOUTH AMERICA.

##### PERU.

(From Our Special Correspondent.)

**Patara (Caráz)** is probably the highest spot in the world where mining is carried on and where the *Engineering and Mining Journal* is being read. I cannot begin to tell you how greatly we appreciate and value the *Journal*.

**CALLUASH GOLD MINES COMPANY, CALLUASH.**—These mines are situated at an altitude of 7,000 ft. The 5-stamp mill erected some time ago with amalgamators, Pelton water wheels, etc., is in operation.

**PATARA MINING COMPANY.**—A mill has recently been erected at this company's property at Patara, combining concentrating, lixiviation and smelting. The property is situated at an altitude of 16,000 ft. and 3½ leagues (or four hours) from Calluash.

#### WESTERN AUSTRALIA.

**GREAT BOULDER PROPRIETARY GOLD MINES.**—For the four weeks ending May 24th this company reports 30 stamps at work. There were 2,095 tons of ore worked, the yield being 6,552 oz. gold, an average of 3.13 oz. per ton.

**HARQUAHALA GOLD MINING COMPANY, LIMITED.**—Mr. Robert M. Raymond, manager of this company's mines at Kalgoorlie, submits the following report of operations for the months of February and March: "Developments have been confined to sinking two shafts on Lease 1,008. One, the south shaft, near the prospecting shaft at the south of the lease, has been sunk to a depth of 125 ft. A crosscut has been started for the lode, which will be encountered in a short distance, and a drift will then be run to the ore body opened up in the prospecting shaft. The shaft will be continued to a depth of 250 ft. to determine the nature and value of this ore body in depth and in the undecomposed rock. The west shaft is located 100 ft. from the north and west lines of the lease. The surface indicates the possibility of an ore body similar to the one opened up in the south end. The shaft has been sunk to a depth of 100 ft. and a crosscut run 38 ft. to the east. Small stringers have been encountered carrying traces of gold. The crosscut will be continued farther to open up this ground. The expenditure for the two months has been £330 for labor and £80 for supplies, etc.

#### COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 11.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending June 4th, 1897, compared with the corresponding period last year:

Pennsylvania Railroad.....	1897.		1896.
	Week.	Year.	Year.
	57,897	1,432,153	1,540,685

PRODUCTION OF BITUMINOUS COAL in tons of 2,600 lbs. for week ending June 4th, and for years, from January 1st, 1897 and 1896:

Shipped East and North:	1897.		1896.
	Week.	Year.	Year.
Allegheny, Pa.....	53,448	967,597	1,038,327
Barclay, Pa.....	679	21,638	19,672
Beech Creek, Pa.....	185,482	1,517,079	1,375,570
Broad Top, Pa.....	8,347	176,410	189,082
Clearfield, Pa.....	79,166	1,929,103	2,078,241
Cumberland, Md.....	153,817	1,535,289	1,274,104
Kanawha, W. Va.....	890,983	1,463,828	1,367,758
Phila. & Erie.....	1,328	155,911	30,538
Pocahontas Flat Top.....	168,979	943,176	.....
Totals.....	542,229	8,712,051	7,373,772

Shipped West:	1897.		1896.
	Week.	Year.	Year.
Monongahela, Pa.....	38,417	578,369	445,916
Pittsburg, Pa.....	36,825	734,285	828,284
Westmoreland, Pa.....	38,503	792,785	892,948
Totals.....	113,745	2,105,437	2,167,148
Grand totals.....	655,974	10,817,488	9,540,920

Production of coke on line of Pennsylvania Railroad for the week ending June 4th, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 90,279 tons; year, 1,877,980; to corresponding date in 1896, 1,984,825 tons.

†For week ending May 22d. †For week ending May 31st. §For 10 days ending May 31st.

#### Anthracite.

Trade in hard coal has not materially changed since last week. Where an occasional report is heard that business has been better during the week, it is due entirely to local causes that have not effected the market as a whole. Buyers who decided to withhold orders when the beginning of the present month brought no change in either price or tonnage mined are now convinced that this was the proper thing for them to do. This conviction has been brought about by the widely circulated reports that certain anthracite companies, beginning July 1st, are going to work their collieries six 8-hour days each week. When it is remembered that only a few weeks ago the producing companies were obliged to stock a portion of the coal prepared under the limit allowed, and it is also borne in mind that an advance of 25c. per ton is to be made on all prepared sizes July 1st, the result of such a change can easily be foreseen, and certainly warrants the withholding of orders by buyers. In the trade, the reports that the collieries are to work full time in July is discredited; indeed, it is said that such a thing is out of the question, yet the fact remains that the report has injured trade whether it is true or not. As a result, buying during the remainder of June will continue on the hand-to-mouth basis, with a possible strengthening toward the end of the month if any intimation is given by the producers as to what they will do in July.

The inquiry at Albany into the affairs of the coal companies is scarcely causing comment. Indeed, so long as the legal representatives of the State and of the companies are arguing for and against the right of the authorities to make an investigation, there is little that can be commented upon.

#### Bituminous.

The Eastern seaboard soft-coal trade is quiet, and outside of the talk about a contract with the New York Central Railroad, there is no contract business doing. Transient trade being also dormant, it leaves the market merely in the state of supplying the contracts already taken. There has been some further talk of labor troubles in the regions where there have been reductions of wages, but not only the men but the labor agitators also seem to recognize that the condition is such that where reductions have been made they have practically been forced upon the operators, and considering all things, the strike talk has been of a minimum character. There seems to be no talk among the coal operators themselves at this time of a combination for next year, though this is extremely early for such a thing to be heard of. The idea in the minds of the coal trade in regard to combinations is that the main line railroads in protection of their own interests will take some hand in restraining the extreme and foolish competition. The sole thing, apparently, with the sellers in taking trade is the reduction in price which they hope and rather expect to get later from the railroads. This has been duly noted and commented upon by the railroad officials themselves, and only the jealousies that have prevailed in railroad circles have prevented more effective means from being taken to meet the situation.

The trade coming from the far East is smaller than it should be in bulk, and even with the low price of coal there is a continued squeezing for the last 5c. on freights. Sound business is more quiet than it has been, though there still continues to be a fair amount of coal going forward to this consuming territory. New York harbor trade is slow and consumers are taking a little more time between their orders than the operators believe is usual.

All-rail trade keeps up fairly well, though there is a continued effort to reduce the already low prices prevailing in this trade. Transportation from mines to tide is fairly good, and it is thought that the stocks on hand, which blockaded the shipping ports the last few weeks, are very much reduced. Car supply is up to all demands. In the coastwise vessel market vessels are not in good supply, though there seem to be sufficient for the trade. Freights are inclined to be weak.

We quote current rates from Philadelphia to Boston, Salem, Portland and Portsmouth, 55@60c.; Providence, New Bedford and Sound ports, 50@55c.; Wareham and Newburyport, 70c.; Lynn, 70@80c.; Dover, 90c. and towage; Saco, 85c. and towage; Bath, 55@60c.; Gardiner, 60@65c. and towage; Bangor, 65@70c. Five and 10c. above these rates is asked from Baltimore, Norfolk and Newport News.

#### NOTES OF THE WEEK.

Coal receipts at San Francisco in May were 94,749 tons. For the five months ending May 31st, the receipts were: Eastern, anthracite and Cumberland, 3,728; Oregon and Washington, 243,631; British Columbia, 210,721; Australia, 56,472; Japan, 160; Great Britain, 26,722; total, 541,434 tons, showing a decrease of 5,162 tons, or 0.9% from last year. There was a large increase in receipts from Washington, and a decrease in those from Australia.

#### Buffalo.

June 10.

(From Our Special Correspondent.)

Since last letter business in anthracite coal has been light at unchanged quotations for home, nearby towns and other places. Freight rates continue to rule low and but little doing in coal shipment. Bituminous coal also quiet and without new features of interest.

The shipments of coal westward by lake from Buffalo for the week ending June 5th aggregated only 39,455 net tons, distributed as follows: 15,955 tons to Chicago, 4,100 tons to Milwaukee, 3,000 tons to Duluth, 2,800 tons to Superior, 2,200 tons to Kenosha, 500 tons to Saginaw, 400 tons to Sault Ste. Marie, 1,100 tons to Manitowoc, and 9,400 tons to miscellaneous ports. The rates of freight were 35c. to Saginaw, 25c. to Kenosha, Manitowoc and Sault Ste. Marie, and 20c. to Chicago, Duluth, Superior and Milwaukee.

Sometime since the Grand Trunk Railway issued an order to the effect that all freight charges on slack coal coming from United States ports into Canada must be prepared at the point of shipment. This order has been canceled and the railway will now accept slack coal, the freight charges to be paid when the coal is delivered.

The following statistics of the coal trade of Buffalo were compiled by Mr. William Thurstone, secretary of the Merchants' Exchange: Receipts and shipments by railroad not reported by request, from opening of navigation: Lake receipts, none this year or two preceding years; shipments by lake to June 1st, 198,850 net tons as compared with 330,989 net tons in 1896 and 259,788 net tons in 1895; receipts by canal to June 1st, none, as compared with 3,586 net tons in 1896 and none in 1895; shipments by canal to June 1st none, as compared with none in 1896 and 896 net tons in 1895. The aggregate shipments by lake thus far this year show a decrease of 132,139 net tons under 1896, and a decrease of 60,938 net tons under 1895. Lake freights hence from opening of navigation to June 1st, 25c. @ 20c. to Chicago and Milwaukee, 20c. to Duluth and Lake Superior ports, 25c. to Green Bay and Racine, and 40@35c. to Saginaw. A year since the rates were 40@60c. to Chicago, 40@55c. to Milwaukee, 25c. to Duluth and Lake Superior ports, 45@55c. to Green Bay, 25c. to Toledo and Detroit, 45@60c. to Racine, 35@40c. to Saginaw, 25@35c. to Bay City, and 25c. to Ashland. The distribution of coal thus far this season by lake was about as follows: 99,965 net tons to Chicago, 41,800 net tons to Milwaukee, 18,300 tons to Duluth, 3,850 tons to Racine, 1,000 tons to Green Bay, 30,300 tons to Superior, 1,550 tons to Saginaw, 2,800 tons to Kenosha and 75 tons to Alpena.

#### Pittsburg.

June 10.

(From Our Special Correspondent.)

**Coal.**—Business as relates to coal is on a limited scale; there are two reasons for the present condition of affairs: Navigation is suspended and coal men are waiting for a free Monongahela; the latter is looked for daily and cannot be much longer delayed. Another reason for the stagnated coal trade is that there is a great scarcity of coal cars and many of the mines are closed. Another trouble is the fact that navigation on the Great Lakes is very backward this year, and few of the steamers are in commission. The Pennsylvania lines have 2,700 loaded cars on the track between Conway and Cleveland. The majority of the mines in the Pittsburg District are now idle. There is no trouble over the mining rate in the river district at present, \$1.65 per 100 bu. being paid in the fourth pool; 50c. more in the lower pools.

A big coal deal has been closed; 12,000 acres of coal land on the Allegheny River have been purchased by a New York syndicate. In upper and lower Burrett Township, and fronting on the Allegheny River, Mr. A. B. Copeland and the syndicate he represents are buying up all the coal land available. The government dams are expected to be completed in a year.

[[Connellsville Coke.—Figures for the month show that there was no great slump in production.



The trade hovers close to the 102,000 ton mark weekly, with persistent regularity. At Greensburg work will begin soon on a coke plant to employ between 300 and 400 men, and a seven-mile railroad. The incorporators of the railroad are principally Pittsburg men, among them Charles E. Soeer, president of the First National Bank, and John M. Wilson; the same men are interested in the coke plant. It is said that John D. Rockefeller and William C. Whitney are heavily interested in the movement. The week's summary of the region shows 10,238 ovens in blast with 8,039 idle. The reports show little change. The production of the region estimated upon the ovens drawn amounted to 101,415 tons, being an increase of 373 tons. In the running order of the 10,238 ovens in blast, 4,372 ovens made six days; 5,532 ovens five days; 284 ovens four days and 50 ovens, the Semet-Solvay plant, three days; an average of 5.38 days as against 5.34 days the preceding week. The week's coke shipments were: To Pittsburg, 2,495 cars; points West, 2,265 cars; sent East, 1,255 cars; total, 6,015 cars.

**IRON MARKET REVIEW.**

NEW YORK, Friday Evening, June 11, 1897.

**Pig Iron Production and Furnaces in Blast.**

Fuel used.	Week ending		From Jan., '96.		From Jan., '97.	
	June 12, 1896.	June 11, 1897.	F'ces.	Tons.	F'ces.	Tons.
Anthracite.	41	25,900	24	13,800	678,038	408,486
Coke.....	135	161,170	107	152,900	3,980,139	3,379,614
Charcoal...	19	6,130	15	3,450	124,029	119,186
<b>Totals ...</b>	<b>195</b>	<b>193,200</b>	<b>146</b>	<b>170,150</b>	<b>4,782,197</b>	<b>3,907,286</b>

We are at last able to report some improvement in the iron market. Despatches were sent out from Pittsburg early in the week of a very sensational nature, but were generally discredited. There was a moderate basis in fact for these reports, but nothing warranting the announcement of a boom. There has been some heavy buying, especially of Bessemer pig, in Pittsburg; local opinion is divided as to how much of it is speculative, but a part, at least, seems to be based on actual demand. Better reports come from other markets also, and there is evidently an improvement in the demand for raw iron and steel. How far this is based on actual orders from consumers is still uncertain. Most manufacturers of finished products have allowed their stocks to run down, and any new orders are immediately felt. No improvement in prices can be reported, however; there are too many people anxious to sell to permit such a movement until increased demand is stronger and surer than it is now. At the least symptom of improvement there is a rush to sell, which keeps quotations down. The attempt to form a wire-rod pool has been abandoned for the present, though there is some talk about renewing it later. There is also talk of a renewal of the steel rail pool, but it is doubtful whether any confidence can be placed in these rumors.

The stocks of pig iron reported unsold on June 1st show a slight increase; they reached a total of 1,050,252 tons, being 11,613 tons more than on May 1st, and 140,609 tons more than at the beginning of the year.

**NOTES OF THE WEEK.**

From advance proofs just received of the annual Report of the American Iron and Steel Association we take the following: "Our statistics of the production of open-hearth steel in the United States embrace steel made in the open hearth by both the acid and basic processes. For the first time we have separated steel made by the basic process in 1896 from that made by the acid process. Direct castings are included with ingots. The total production of open-hearth steel in 1896 was 1,298,700 tons against 1,137,182 tons in 1895, an increase of 161,518 tons, or over 14%. The open-hearth steel made in 1896 was produced by 69 works in 11 States, New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Alabama, Ohio, Indiana, Illinois, Missouri, and California. The open-hearth steel rails that were produced in 1896 amounted to only 705 gross tons. Of the production in 1896 a total of 776,256 tons was made by the basic process and 522,444 tons by the acid process. Fourteen works made basic open hearth steel only in 1896, 38 works made acid open-hearth steel only, and 17 works made both acid and basic open-hearth steel.

"The production of crucible steel in the United States in 1896 amounted to 60,689 gross tons, against 67,666 tons in 1895, 51,702 tons in 1894, 63,613 tons in 1893, 84,709 tons in 1892, 72,586 tons in 1891 and 71,175 tons in 1890. The crucible steel produced in 1896 was made in 11 States—Connecticut, New York, New Jersey, Pennsylvania, Maryland, Tennessee, Ohio, Indiana, Illinois, Michigan and Wisconsin. Of the total production of 1896 of crucible steel Connecticut and New York contributed 6,468 tons; New Jersey, 7,261 tons; Pennsylvania, 43,107 tons; the Western States, 2,733 tons, and the Southern States, 1,100 tons.

"The production of steel in the United States in 1896 by various minor processes amounted to 2,394 gross tons, against 858 tons in 1895, 4,081 tons in 1894, 2,806 tons in 1893, 4,548 tons in 1892, 4,484 tons in 1891, and 3,793 tons in 1890. Blister, puddled and

patented steel, including castings, are embraced in these figures.

"The production of all kinds of steel in the United States in 1896 was as follows: Bessemer, 3,919,906 gross tons; open hearth, 1,298,700; crucible, 60,689; all other steel, 2,394; total, 5,281,689 tons, against 6,114,834 tons in 1895; 4,412,032 tons in 1894; 4,019,925 tons in 1893, and 4,927,581 tons in 1892."

The report of the American Iron and Steel Association for 1896 says of the total production of iron and steel in finished forms: "By the phrase rolled iron and steel we include all iron and steel rolled into finished forms, as follows: (1) all sizes of iron and steel rails; (2) plate and sheet iron and steel; (3) iron and steel plates for cut nails and cut spikes; (4) wire rods; (5) iron and steel structural shapes; (6) bar, bolt, hoop, skelp and rolled axles. Hammered axles and other forgings are not included in our statistics of rolled iron and steel. The production of all iron and steel rolled into finished forms in the United States in 1896 was 5,515,841 gross tons, against 6,189,574 tons in 1895, a decrease of 673,733 tons, or over 10%. Twenty-eight States rolled either iron or steel or both iron and steel in 1896, one more than in 1895.

"Pennsylvania made 56.8% of the total production of rolled iron and steel in 1896, against 56.4% in 1895; Ohio made 13.9% in 1896, against 14.4% in 1895; Illinois made 10.7% in 1896, against 10.1% in 1895, and Indiana made 3.5% of the total product in 1896. No other State produced 3% in that year. Texas and Iowa were the only States having rolling mills located within their borders which did not roll either iron or steel in 1896.

"The iron blooms and billets produced in forges directly from the ore in 1896 amounted to 1,346 gross tons, against 40 tons in 1895 and 1894, 864 tons in 1893, 2,182 tons in 1892, 5,290 tons in 1891, 7,094 tons in 1890 and 11,078 tons in 1889. The ore blooms produced in 1896 were made at the Standish Iron Works of the Chateaugay Ore and Iron Company, at Standish, Clinton County, New York, built in 1895; and at the Helton Forge of W. J. Pasley, at Crumpler, Ashe County, North Carolina. The iron blooms produced in forges from pig and scrap iron in 1896, and which were made for sale and not intended for the consumption of the makers, amounted to 6,494 gross tons, against 7,185 tons in 1895, 3,221 tons in 1894, and 6,605 tons in 1893. All the pig and scrap blooms so made in 1895 and 1896 were produced in Pennsylvania and Maryland."

**New York. June 11.**

According to the views of most sales agents, the local iron market has reached the turning point. An upward movement in pig iron which occurred in the last two days is regarded by some as a forerunner of a general upward movement of the whole list. Export trade is reported fair, with evidence of an increase shortly. Among contracts recorded is one for 2,500 tons of rails for India by the Maryland Steel Company, and another of 1,200 tons of steel billets for Russia, the latter order being secured by an Eastern mill.

**Pig Iron.**—Nearly all the local sales agents are enthusiastic over what they deem the advance guard of the good times which all have been looking for so long. The tonnage sold this week is reported as unusually heavy and a prominent dealer stated that he looked for still heavier sales in the near future.

Prices remain as follows, although advances are looked for soon: Northern No. 1 X foundry, \$12@ \$12.50; No. 2 X foundry, \$11@ \$11.25; No. 2 plain, \$10.50 @ \$11; gray forge, \$9.75@ \$10.25. Southern No. 1, \$10.25@ \$10.75; No. 2, \$9.75@ \$10; No. 1 soft, \$9.75@ \$10; No. 2 soft, \$9.75@ \$10; gray forge, \$9.25@ \$9.50; basic, \$10.25@ \$10.50. All prices are for tidewater delivery.

**Cast-Iron Pipe.**—Business in cast-iron pipe is steady with a fair demand for July and August deliveries, with prices a little higher than for the past few weeks.

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

**Steel Billets.**—Business locally continues quiet, with mill prices a little lower than last week at about \$15.25@ \$15.50.

**Merchant Iron and Steel.**—Trade in this article remains about stationary, but with steadier prices. Common bars, 1@ 1.05c.; refined, 1.10@ 1.25c.; soft steel bars, 1.05@ 1.10c. Other quotations are: Steel hoops, 1.35@ 1.40c.; base; steel axles, 1.55@ 1.60c.; links and pins, 1.50@ 1.60c.; light cotton ties, 50c. per bd. at mill. All prices are for delivery on dock New York, and are for large quantities.

**Plates.**—Some activity was displayed during the past week with prices nominally unchanged. We quote for universal mill plates 1.15@ 1.20c. For steel plates prices are: Tank, 1.10@ 1.15c.; boiler shell, 1.20@ 1.30c.; flange, 1.25@ 1.40c.; firebox, 1.60@ 1.75c., and 2.25@ 2.50c. for locomotive firebox, according to quality. Charcoal iron plates are 2.25c. for shell, 2.75 for best flange and 3.25 for firebox. Rivets are 3@ 3.25c. for iron and 1.75@ 1.85c. for steel. Prices are for tidewater delivery in large quantities.

**Structural Iron and Steel.**—Business continues fair with prices nominal, with the exception of channels, which since the dissolution of the combination have declined, and are now on a level with

beams. We quote for angles, 1.10@ 1.15c.; tees, 1.35@ 1.50c.; channels, 1.25@ 1.30c. The price of beams, New York delivery, is 1.25@ 1.30c. for ordinary sizes, 1.45c. for 20-in., and 1.50c. for 24-in., carload lots.

**Steel Rails and Rail Fastenings.**—The condition of the market for rails has become more favorable than it has been for the past few weeks, with prices steady. We quote: Standard section steel rails, \$18@ \$20 at mill, and girder rails \$23.

Quotations for rail fastenings are: Angle bars, 1.05@ 1.10c.; spikes, 1.50@ 1.60c.; bolts, 1.75@ 1.85c. for square nuts and 1.80@ 1.85c. for hexagon nuts. These prices are for carload lots.

**Wrought-Iron Pipe.**—There has been a better demand during the past week, with prices strong, and discounts are as follows: For plain pipe, out of store: 1 1/2 in. and over, 67, 10, 10, 10 and 10%; 1 1/4 in. and under, 50, 10, 10, 10 and 10%. Galvanized pipe, 1 1/2 in. and over, 55, 10, 10, 10 and 10%; 1 1/4 in. and under, 50, 10, 10, 10 and 10%. For fair-sized orders these discounts are made with an additional 5% for less than carload lots. For carload lots this additional discount is 7 1/2% to 10%.

**Nails.**—Wire nails have received fair attention with prices a little higher, \$1.55@ \$1.65, while at mill they are \$1.35@ 1.45. In cut nails trade is also strong, and \$1.25@ \$1.30 base is quoted for carload lots at mill.

**Old Material.**—Business has fallen off somewhat, with prices lower than they have been for some time, but indications point to a revival at an early date. Old iron tee rails, \$11@ \$12 per ton; old steel rails, \$10@ \$11; No. 1 wrought scrap iron, \$10@ \$11; good machinery scrap, \$9@ \$10, all f. o. b. cars; wrought pipe and tubes, \$7.50 per ton; car wheels, delivered at buyer's works, \$9@ \$10; burnt iron, \$5@ \$6; cast borings, \$6.50@ \$7 per ton delivered at mill.

**Buffalo. June 9.**  
(Special Report of Rogers, Brown & Co.)

The only change worthy of note is a greater volume of business. There is an increasing recognition among buyers that prices now ruling are excessively low and not likely to be lower, which is stimulating a few to buy freely and cover future wants to a limited extent. There has not been, as yet, much increase in the actual consumption of this district, although the tonnage of the foundries is slowly growing. Prices remain unchanged and are quoted below, on the cash basis f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$10.75; No. 2 strong foundry coke iron, Lake Superior ore, \$10.50; Ohio strong softener No. 1, \$10.75; Ohio strong softener No. 2, \$10.50; Jackson County silvery No. 1, \$14; Southern soft No. 1, \$10.75; Southern soft No. 2, \$10.50; Niagara malleable, \$11.

**Cleveland. June 9.**  
(From Our Special Correspondent.)

**Iron Ore.**—Although the sales of ore during the past week have been in small lots the sum total is nearly as large as the aggregate for the previous week. Among the buyers there were none of the larger purchasers and one encouraging feature of the market lies in the fact that some of them have not yet made an effort to secure a supply of ore for the season. The ore movements from Lake Superior points to Lake Erie ports up to June 1st aggregated 890,305 tons, as against 1,343,228 for the same period last year, and 1,051,129 in 1895.

The present indications are, however, that the total amount of ore sold this season will not fall as much below the total transactions of last year as seemed certain several months ago. Following are the quotations: Specular and magnetic ores, Bessemer quality, \$9@ \$9.75; specular and magnetic ores, non-Bessemer quality, \$2.50@ \$2.75; hematite ores, Bessemer quality, \$2.50@ \$3; hematite ores, non-Bessemer quality, \$2@ \$2.50.

The outlook is a little brighter for the ore carriers, but there has been no marked improvement in the ore carrying rates. The rate is still 50c. from Marquette and the head of the lakes, and 40c. from Escanaba.

**Pig Iron.**—The Bessemer market is somewhat stronger this week, a large number of inquiries having been made for that variety. The trading in foundry irons has been light. The quotations follow: Lake Superior charcoal, \$13.25; Bessemer, \$9.75@ \$10; No. 1 foundry, \$10.50@ \$10.75; No. 2, \$10@ \$10.25; No 1 Ohio Scotch, \$10.65; No. 2, \$10.15; gray forge, \$8.75@ \$9.

**Philadelphia. June 11.**  
(From Our Special Correspondent.)

**Pig Iron.**—There is some warrant for the crowing that is going on in Eastern Pennsylvania iron markets, but the actual sales and genuine inquirers show that a little more is being made out of it than circumstances justify. So many offers have been made by anxious sellers or their representatives that higher prices cannot be expected to immediately follow an improving demand. There is a stronger tone to the market and it is certainly encouraging makers, yet our people will wait. The foundrymen and millmen have not the business in hand to make it necessary for them to do anything else than they are doing. They are all on the outlook for business and all that can be reached personally say they are more than ever satisfied that business of considerable magnitude is close at hand. Quotations are No. 1 X foundry, \$11.75@ \$12.25; No. 2 X foundry, \$10.75@ \$11.25; No. 2 plain, \$10.50; forge



iron, \$9.50@10.25; Bessemer, \$10.75; low phosphorus, \$16.

**Billets.**—The market has finally turned in an upward direction, but this has not been due to a stronger local demand. We are in the dark as to the cause of the firmness in quotations. Sales have been made in a small way at \$16.50. Mills hold large contracts yet.

**Merchant Bar.**—Three rolling mills in the Schuylkill Valley resumed this week after a long idleness. Some few others will begin making more iron. How much business they have cannot be got at. Two or three car builders are on the market for stock, but the quantity here wanted can not be found out. Prices are certainly low, hardly quotable.

**Sheet Iron.**—Some parties in the trade are talking of the very much improved summer prospects, and base their hopes on work guaranteed for July. Common sheet iron has picked up this week and two mills have been favored with good orders.

**Skelp.**—There is no activity and prices are hardly quotable.

**Merchant Steel.**—A revival in the retail demand has come and a fair distribution is in progress this week. Purchases have been stimulated by very attractive quotations.

**Pipes and Tubes.**—From several sources there is encouragement to expect a fair and, one or two say, a very large summer business in pipe work. The demand just now is unimportant.

**Plate and Tank.**—Manufacturers with one accord have withdrawn some extremely low quotations. General prices have not advanced and probably will not, but shipyard and car-building business is likely to be presented in a short time and lift the heavy clouds. Tank is 1'15c; universals, 1'20c.; flange, 1'30; firebox, 1'50c.

**Structural Material.**—A similar step has been taken in this branch by the withdrawal of some of the very low quotations which were emergency quotations when offered. Several good jobs are on the market and more are in sight. The market is stronger. Angles are 1'15c.; beams and channels, 1'25c. It was expected in high quarters that a few big orders would be placed this month, but from all that can be learned the bulk of this June business will be in small orders.

**Steel Rails.**—An order for export was taken and several small orders to keep track repairers going. Quotations \$19@20.

**Old Rails.**—Old iron rails are \$11.50, and old steel rails, \$10.

**Scrap.**—In view of the approaching activity of the iron trade more interest is felt in getting a desirable lot of scrap. Some sales of No. 2 light were made at \$7@7.50; choice railroad still rules at \$11.50@12; machinery cast, \$9; heavy steel scrap \$10.

**Pittsburg. June 10.**

(From Our Special Correspondent.)

**Raw Iron and Steel.**—Business is steadily increasing. The demand for both raw and finished material is very satisfactory, showing very conclusively that the upward movement has come to stay. The sales of iron last week exceeded 104,000 tons; three sales of Bessemer alone aggregated 32,500 tons. Reports come from various leading markets that business is opening up on a liberal scale; the feeling that the worst is over is already gaining ground and there is much encouragement in the reports received from various points; what is wanted is a settlement of the labor troubles. That being accomplished the last six months of 1897 will show a wonderful revival of trade. A good deal also depends upon what may be done in Washington; however, reports from there seem favorable for an early settlement of the tariff question which the country has been waiting for so long. The principal demand was for Bessemer; there is a difference of opinion in regard to the large sales of Bessemer the past week, some parties contending that they were for speculative purposes, while others say they were for consumption; at all events the sales were a good point for furnacemen.

For wire nails the market was firm with an increased demand, and with an upward tendency in prices; there is talk of forming a combination in order to advance prices, the present rates being \$1.35@1.40 per keg. Sheet bars are in liberal demand. Some of the mills have large contracts booked; we hear of sales exceeding 12,000 tons. The Ohio Steel Company reports orders exceeding 50,000 tons booked. For wrought iron and steel pipe the demand is very active; all the plants are running full. During May we noted contracts for 80 miles of pipe. The Pennsylvania Tube Works have closed a contract for 90 miles of 4-in. pipe, destination, the Morena-Emin Petroleum Company, of Amsterdam, operating in the Netherlands, East Indies. This opens up a new trade for Pittsburg. A. M. Byers & Company's pipe mill on the South Side has been running double time all season, making over 100 tons of pipe every 24 hours. For steel rails the market was firm; not much new business coming in, but the mills are generally busy on previous contracts. Structural material in better demand with a firmer feeling; prices have an upward tendency.

**Latest.**—The improvement noted in our last has been maintained. Steel billets have advanced, with sales at \$15, the highest figure touched for

some time. Bessemer pig in Pittsburg reached \$10.10; this sale was for delivery September, October, November. The volume of transactions shows up well. There are sales of Bessemer pending, aggregating between 35,000 and 40,000 tons that may be closed out before the end of the week. Foundry iron and gray forge are dull; no demand but not quotably lower. On the whole the volume of business is increasing, and the outlook for a big trade is very favorable. The Jones & Laughlins strike is about over; there are too many idle men to make a strike successful.

By TELEGRAPH.—PITTSBURG, June 11.—The market for Bessemer pig continues firm, with large sales. In other respects no change can be reported.

Tons.	Cash.	SHRETT BARS.	
		Tons.	Cash.
15,000	Bess., A., J., Val. \$9 60	8,500	Del., Pitts. .... \$18 00
7,500	Bess., A., S., Pitts. 9 90	1,500	Del., Pitts. .... 17 60
5,000	Bess., J., J., Val. 9 25	500	Del., Pitts. .... 17 40
5,000	B., J., A., S., P. 9 90	SKELP IRON.	
5,000	Bess., Sept. Oct., Nov., Pitts. 1 10	700	W. G., Pitts. \$1.00 4 m.
3,000	Bess., A., S., Val. 9 50	380	Sheared, Pitts. 1.20 4 m.
3,000	Bess., J., A., Val. 9 35	500	N. G., Pitts. .... 1.00 4 m.
2,000	Bess., J., J., Val. 9 25	SKELP STEEL.	
2,000	B., prompt, Val. 9 25	1,000	Sheared, Pitts. \$1.00 4 m.
2,000	Bess., June, Val. 9 25	800	W. G., Pitts. ... 0 85 4 m.
1,500	Bess., June, Val. 9 30	500	N. G., Pitts. .... 0 85 4 m.
1,200	Mill I., J., A., P. 8 75	MUCK BAR.	
1,000	Bess., June, Val. 9 25	500	Neu., Del., Pitts. \$19.00
1,000	Bess., Dec., Val. 9 40	BLOOMS, BILLETS, BAR ENDS	
500	Bess., J., J., Pitts. 9 90	1,000	Bloom and Billet ends, June, P. \$9.80
500	Mill I., June, P. 8 60	100	Bar ends, June, P. 9 75
150	No. 2 F., pr., P. 9 65	STEEL WIRE RODS.	
CHARCOAL.		750	Delivered, Pitts. \$20.50
50	Cold Bl., Pitts. \$21.50	FERRO-MANGANESE.	
50	No. 2 F., Pitts. ... 15 50	500	804 Del., P. .... \$46.00
25	No. 3 F., Pitts. ... 15 25	OLD RAILS AND SCRAP IRON.	
25	Cold Bl., Pitts. .... 22 00	1,000	Iron R., gr., Pitts. \$11.50
BLOOMS, BILLETS, SLABS.		500	Steel R., gross, P. 9 25
6,000	Bill, J., J., S., Pitts. \$14 80	400	Steel R., gross, P. 9 50
5,000	Bill, J., J., A., Pitts. 15 00	300	Steel R., gross, P. 9 75
2,000	Bill, J., J., Pitts. 14 35	300	Steel R., gross, P. 9 75
2,000	Bill, J., A., S., Pitts. 14 25	300	No. 1. Wr't Scrap, Pitts. .... 11 00
500	Bill, June, Pitts. 14 75	200	Cast Scrap, g., P. 8 50
500	Bill, J., J., Pitts. 14 50		

**METAL MARKET.**

NEW YORK, Friday Evening, June 11, 1897.

**Gold and Silver.**

**Prices of Silver per Ounce Troy.**

June.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	June.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
5	4.86%	27 1/2	60	.464	9	4.86%	27 1/2	60	.464
7	4.86%	27 1/2	60	.464	10	4.86%	27 1/2	60	.463
8	4.86%	27 1/2	60	.464	11	4.86%	27 1/2	60	.463

In the absence of any special orders silver has been barely steady, and under sale of moderate amounts has yielded to 27 1/2 d. June shipment and 27 1/2 for futures. No new features in the situation present themselves. The June and July output is already largely placed.

The United States Assay Office in New York reports the total receipts of silver at 96,000 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.	
	London Pence.	New York Cents.	London Pence.	New York Cents.	London Pence.	New York Cents.
January	29 7/4	64 79	30 69	67 13	27 36	59 69
February	29 68	64 67	31 01	67 67	27 47	59 90
March	28 96	63 96	31 34	68 40	28 33	61 98
April	28 56	61 85	31 10	67 92	30 39	65 61
May	27 86	60 42	31 08	67 88	30 47	65 75
June	27 1/2	60 1/2	31 46	68 09	30 61	65 61
July	27 1/2	60 1/2	31 45	68 75	30 45	65 75
August	27 1/2	60 1/2	30 93	67 34	30 40	65 61
September	27 1/2	60 1/2	30 19	65 68	30 54	65 90
October	27 1/2	60 1/2	29 68	65 05	30 89	67 64
November	27 1/2	60 1/2	29 46	64 98	30 79	67 42
December	27 1/2	60 1/2	29 70	65 24	30 40	66 47
Year	27 1/2	60 1/2	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, New York**

For the week ending June 11th, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

Week	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1897..	\$261,444	\$96,002	\$693,325	\$22,836	\$533,531
1896..	10,942,091	1,667,827	18,210,631	1,133,617	E. 26,351,878
1895..	28,773,277	16,972,211	16,574,311	935,798	E. 27,439,579
1894..	32,521,622	19,794,611	15,676,641	782,641	E. 27,621,011
1894..	54,888,972	9,283,818	17,656,657	747,146	E. 62,514,665

Of the gold exported for the week \$260,000 went to Germany, and the balance to the West Indies; the silver went to London and South America. The gold and silver imported came chiefly from Central America and the West Indies.

**Gold and Silver Exports and Imports**

At all United States ports, April, 1897, and years from January 1st, 1897 and 1895:

	Coin and bullion.		In ores.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
April 1897..	\$6,629,419	\$619,452	\$1,800	\$319,604	E. \$5,662,163
1897..	7,910,128	2,504,939	91,793	1,390,556	E. 4,106,431
1896..	16,916,572	23,747,264	80,319	453,022	E. 7,203,395
SILV.					
April 1897..	4,895,895	578,124	250	1,604,104	E. 2,714,917
1897..	18,470,635	2,698,303	246,950	6,566,388	E. 9,452,954
1896..	20,420,522	4,391,752	554,109	5,543,136	E. 11,039,543

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

**FINANCIAL NOTES OF THE WEEK.**

Business continues quiet and dull, although some signs of improvement may be noted here and there. These are irregular and spasmodic, however, and do not indicate the steady growth which we ought to have. The tariff bill is still before the Senate, and although some action is promised by July 1st, few people expect it by that time. Meantime Cuban war rumors continue, and the apprehension caused by them is still added to the tariff uncertainty to paralyze trade. Many have accepted the situation and do not look for any change before fall—possibly not then—by they do not care to calculate further ahead than they are obliged to do.

Gold imports were light this week. None went out early in the week, and only \$500,000 is reported taken for shipment on Sa'urdry. While the movement still continues it seems to be intermittent in its character. The demand for gold for Austria has been satisfied; most of that now being taken abroad will probably find its way to Russia, which is at present the most active buyer.

The *New York Evening Post* calls attention to a point of importance as follows: "A keener interest than usual attends the current estimates and statistics of the crops. It is a very remarkable fact in our industrial history that the year of positive and continuous recovery from a period of long depression has without exception been a year of favorable domestic harvests, coupled with heavy foreign shortage. Usually such conditions have continued during several successive years; for the mysterious law which governs nature's yield of grain seems to apply in alternate three or four year cycles of bountiful and insufficient harvests. This year, with India and Argentina practically out of the export market, with the French wheat area for this season greatly reduced, and with supplies on hand in the world's granaries reduced by 400,000 bu., or nearly 30% below the total of a year ago, the United States has a peculiar stake in the outcome of its own harvest. The government crop report for June, issued at Washington, indicates a winter wheat crop about 3,500,000 bu. less than that of 1896, and a spring wheat crop some 22,500,000 bu. larger. The crop will still remain, on this basis, smaller decidedly than the average of the last half-dozen years, but large enough to be a more important source of supply to Europe even than the crop of 1896. Simultaneously with this crop estimate, the Bureau of Statistics issues its return of staple exports during May. Export of breadstuffs, by this report, ran \$2,856,178 beyond the May record of 1896; the cereal exports for the eleven months since last June increasing by the enormous sum of \$53,073,796. Meantime it will be noticed also, from the daily returns of railroad deliveries, that corn and oats are moving in to market at Chicago in such volume as to promise remarkable showing."

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending June 5th gives the following totals, comparisons being made with the corresponding weeks in 1896 and 1895:

	1895.	1896.	1897.
Loans and discounts	\$503,437,600	\$476,219,100	\$511,918,700
Deposits	565,986,800	497,180,000	581,255,100
Circulation	13,233,500	14,725,300	14,322,300
Reserve:			
Specie	70,783,800	61,808,500	89,310,900
Legal tenders	80,972,300	80,972,300	11,323,700
Total reserve	\$181,767,100	\$142,781,300	\$190,634,600
Legal requirement	141,499,200	124,295,000	146,313,775
Surplus reserve	\$39,667,900	\$18,486,300	\$45,320,825

Changes for the week this year were increases of \$4,409,000 in loans and discounts; \$5,655,100 in deposits, and \$331,700 in specie; decreases were \$6,700 in circulation, \$213,200 in legal tenders, and \$1,295,275 in surplus reserve.

The statement of the United States Treasury on Thursday, June 10th, shows balances in excess



of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

Table with columns: June 3, June 10, Changes. Rows include Gold, Silver, Legal tenders, Treasury notes, and Totals.

Treasury deposits with national banks amounted to \$17,305,235, an increase of \$55,351 during the week.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports.

Table showing specie holdings for various banks (N.Y. Asso., England, France, Germany, etc.) with columns for Gold and Silver in 1896 and 1897.

The return for the Associated Banks of New York is of date June 5th; all the others are of June 10th, except the Bank of Italy, May 10th, and the Bank of Russia, May 1-13th.

Shipments of silver from London to the East for the year up to May 27th are reported by Messrs. Pixley & Abell's circular as below:

Table showing silver shipments from India, China, and The Straits for 1896 and 1897.

Arrivals for the week this year were £126,000 in bar silver from New York. Shipments for the week were £62,800 in bar silver to India.

Indian exchange has been a little higher, and the Council bills offered in London were taken to the amount of 33 lakhs, at an average price of 14-3/4d. per rupee.

Prices of Foreign Coins.

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

Table showing bid and asked prices for Mexican dollars, Peruvian soles, Victoria sovereigns, etc.

Other Metals.

Copper.—Transactions have been very few, but the market, nevertheless, continues steady, as would seem but natural, in view of the fact that producers are as yet well supplied with orders.

The London market opened on Tuesday at £48 17s. 6d. for spot, but closes easier to-day at £48 10s. for spot and £48 15s. for three months.

Tin has been very firm throughout the week, and more particularly spot, of which the supplies are scarce. Consumption, though not brisk, continues at a fair rate.

The London market, which closed last week at £60 15s., opened the beginning of this at £61 2s. 6d., and closes to-day at £61 5s.

Lead is a little firmer at 3 1/2c., the pressure to

market large quantities having subsided. Values, however, have not as yet been favorably affected, and probably will not until the demand becomes more active.

The London market remains firm at £11 16s. 3d. @ £11 17s. 6d. for Spanish, and £11 18s. 9d. @ £12 for English.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: There has been no particular change since our last report.

Spelter.—Though it is claimed by the parties in control that they are holding for 4 1/2c. at East St. Louis, the few orders which present themselves are being entered at lower figures, as it would appear, at from 4c. to 4 1/2c.

Antimony is unchanged; we quote for Cookson's, 7 1/2c.; Hallett's, 7c.; U. S. Star, 6 3/4c.; Japanese, 6 3/4c.

Nickel.—Business continues quiet, and no change in prices can be reported. We quote for ton lots 33 3/4@36c. per lb., and for smaller orders 35 3/4@38c.

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

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

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

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

Table listing prices for Aluminum, Bismuth, Phosphorus, Tungsten, etc.

Variations in price depend chiefly on the size of the order

Imports and Exports of Metals.

Large table showing imports and exports of various metals (Aluminum, Antimony, Brass, Copper, etc.) for the week of June 10 and for the year 1897.

\*New York Metal Exchange returns. †From our Special Correspondent. ‡Week ending June 4. §Week, June 3.

Average Monthly Prices of Metals

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

Table showing average monthly prices for Copper, Tin, Lead, and Spelter for 1897 and 1896.

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements see page 624.)

New York.

June 11.

Heavy Chemicals.—A decidedly better feeling is noticeable in chemicals, traceable to the expectation of the passage of a tariff bill by July 1st.

We quote: Caustic soda, 60%, \$2.10@2.15; 70@76%, \$1.90@2 per 100 lbs. Alkali, 58%, 60c. for 50-ton lots and over, and 70@80c. for smaller quantities; 48%, \$1@1.20 for jobbing lots.

Acids.—Rather a better business is reported during the past week, with prospects of its continuing for a time. Quotations per 100 lbs. in New York and vicinity in lots of 50 carboys or over are as follows: Acetic acid, commercial No. 8 (in barrels), \$1.40@1.50; in carboys, \$1.50@1.65; redistilled, 28%, in bbls., \$1.70@1.80; in carboys, \$1.90@2.05.

Brimstone.—Continued lack of demand is the only feature in this market, though at this writing an upward tendency is noted, one dealer declining to sell spot goods for less than \$20 per ton.

Fertilizing Chemicals.—A better tone pervades this market. Prices have stiffened and packers have advanced their figures. The low rates which have ruled for some time will from now on be advanced.

Sulphate of ammonia, gas liquor, \$2.12 1/2 for shipment, and \$2.17 1/2 for spot; bone, \$2.05@2.10 per 100 lbs. Dried blood, high grade Western, \$1.00@1.65 per unit, New York; f. o. b. Chicago, \$1.57 1/2 per unit.

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

Nitrate of Soda.—Quotations are higher this week, but the demand is rather poor. Quotations



are 1.80c. for spot; 1.75c. to arrive, and 1.70c. for shipment.

#### NOTES OF THE WEEK.

The New Zealand deposits of sulphur are now being worked more actively than heretofore, in consequence of the prevailing high price of the Sicilian product. Sulphuric acid manufacturers in Australia have hitherto imported their supplies from Italy and Japan, but on March 20th, we understand, 320 tons of sulphur arrived at Sydney from the North Island of New Zealand, and another cargo of 600 tons was reported on the way.

#### Liverpool.

June 2.

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

There is rather a brisk inquiry from the United States reported to-day, for several lines of chemicals for early delivery, in consequence of which the price for chlorate of potash has been advanced. This is probably due to tariff developments and is likely to be only a temporary spurt.

Soda ash is in a firm position, being held in control by makers. Quotations vary according to export market, and nearest range for tierces is about as follows: Leblanc ash, 48%, £4 10s @ £4 15s. per ton; 58%, £4 15s. @ £5 per ton, net cash; ammonia ash, 48%, £3 7s. 6d. @ £4 per ton; 58%, £3 12s. 6d. @ £4 5s., per ton, net cash. Bags are 5s. per ton under price for tierces. Special quotations are given for American business.

Soda crystals are selling to a fair extent at £2 17s. 6d. per ton, less 5% for barrels, and 7s. less for bags. Special terms are made for American orders.

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

Bleaching powder is quiet, but steady, at £6 15s. @ £7 per ton, net cash, for hardwood packages, as to destination.

Chlorate of potash has to-day been advanced to 4d. per lb. for early delivery, in consequence of a brisk inquiry having set in from America.

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

Sulphate of ammonia is inactive at about £7 17s. 6d. @ £8 per ton, less 2½% for good gray, 24% and 25% in double bags f. o. b. here, as to quality.

Nitrate of soda has declined, and is now quoted at £8 @ £8 2s. 6d. per ton, less 2½% for double bags f. o. b. here, as to quantity and quality.

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

#### MINING STOCKS.

Complete quotations will be found on pages 620, 621 and 622 of mining stocks listed and dealt in at:

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

#### NEW YORK, Friday Evening, June 11.

The local mining stock market this week shows a decidedly favorable turn, and those interested seem to believe we are on the eve of another boom, and point to the recent inflation of the silver stocks, which has continued during the past week, as an evidence of the returning interest of the general public in mining stocks.

The whole list seems to have caught the fever, and, in consequence, prices were very strong, with a good demand, which is strengthened by favorable reports from the different properties.

Cripple Creek stocks continue to attract a large part of the attention of the Mining Exchange, with Elkton at 95c. heading the list. Argentine has been in good demand, with very little stock offered, 300 shares being sold at 30c. A rich strike is reported to have been made in this mine, but particulars were not obtainable. Annette has continued in favor, and we note sales of 1,400 shares at 30½ @ 30¾c. Victor Consolidated, which has not appeared in our market for some time, sold in Paris on the 1st inst. at \$3, which shows a recovery from \$2.25, which price was the ruling figure for a short time.

Of the other Colorado stocks, Leadville and Lacrosse have been in very good demand, with the former selling at 7c. to 10c., with sales of 2,800 shares, and the latter at 12c. to 13c., with sales of 2,600 shares.

Mollie Gibson, notwithstanding the favorable news from the mine recently, still hovers around 35 @ 40c., with sales during the week of 2,500 shares.

The market for the Comstocks has shown improvement, caused by advances in prices on the San Francisco Exchange.

Among sales noted are: Best & Belcher shows one sale at 64c. of 300 shares, which is a falling off of 2c. since last week; Consolidated California & Virginia recovered somewhat in the early part of the week to \$1.80, but later sold down to \$1.70 on sales of 200 shares. Ophir records one sale of 200 shares at 80c. in the early part of the week. Sierra Nevada appeared on the list this week, and opening at 25c. advanced to 50c. and closed at the latter figure with sales of 600 shares.

The California stocks were represented by Bruns-

wick Consolidated, of which sales were made at 7 @ 6c., the latter being the closing price; this shows a loss of 2c. since last week. Under date of June 5th the superintendent of this mine writes that the water is now 4 ft. above the 700 station with the pumps doing as well as might be expected.

There was a pressure to sell Standard Consolidated during the week and the stock declined from \$1.50, the opening, to \$1.30 at the closing, on sales of 116,700 shares.

Horn Silver, the Utah stock, ruled steady at \$1.65 on sales of 400 shares. Ontario, another representative of Utah, sold down from \$7.50 to \$6.88 on sales of 150 shares.

Columbian Gold shows another advance during the past week, with the closing price at \$1.80 and total number of shares sold 3,300.

#### Boston.

June 10.

(From Our Special Correspondent.)

The market has improved this week in point of activity as well as prices, and there is a better tone manifested. With the improved condition of the general market, it is quite confidently predicted that the mining interest will have its share in the months to come. The declaration of a \$10 dividend on the Calumet & Hecla this week started a good demand for the stock, which advanced to \$390, a gain of \$15 for the week. This makes \$30 per share paid thus far in 1897, and a total of dividends from the beginning of \$49,850,000. Tamarack sold this week, dividend off, at \$119½ and declined to \$118½. Quincy declined early in the week from \$109 to \$108, but recovered and sold again at \$109.

Boston & Montana advanced from \$123½ to \$127½, but declined to \$126. Butte & Boston sold up to \$17½ with later sales at \$17½. Franklin lost some of the advance of last week, declining to \$15. Osceola improved and advanced from \$29½ to \$31, but later sold at \$30. Kearsarge declined to \$16, and advanced to \$17½ and was quite firm. There was some demand for Atlantic, which sold up from \$19 to \$21½, with later sales at \$20½. Centennial was very active on the good reports received lately from the mine, and advanced from \$5½ to \$8, closing firm. Old Dominion fluctuates between \$15 and \$15½, at which prices it is in good demand. Tamarack, Jr., sold at \$16, same as last week. Wolverine advanced from \$9½ to \$9½, but declined later to \$9½. Arnold was a shade better at \$3½, and a small lot of Allouez sold at 50c.

The gold stocks are becoming quite active again under the lead of Pioneer, which sold up to \$4, closing at \$3½. Gold Coin was a little off, selling at \$4½. Santa Ysabel advanced from \$12½ to \$13½, closing at \$13½. The strength in the stock is due to reported favorable developments at the mines. Boston & Cripple Creek appeared on the market this week with sales of about 4,000 shares at 10c. Merced was dull and declined to \$8½. Napa Quick-silver sold at \$6½ for 100 shares only.

3 P. M.—At the board this afternoon Boston & Montana, after selling at \$126½, declined to \$126. Butte sold at \$17½, and later at \$17½. Centennial declined to \$7½. Old Dominion was firm at \$15½, Santa Ysabel dropped to \$13. Gold Coins advanced \$½ to \$4½, and Pioneer was steady at \$3½.

#### Cleveland.

June 9.

(From Our Special Correspondent.)

The stocks for sale on this market have fluctuated somewhat during the past week, and several sales are reported. Cleveland Cliffs and Pittsburg & Lake Angeline have advanced; investors have made offers for Lake Superior stock and Republic has declined slightly. Although the volume of the transactions has not been as heavy as in past years, the brokers feel encouraged over the prospects of better business in the future.

#### Colorado Springs.

June 10.

[BY TELEGRAPH.]

The following are the closing prices to-day: Alamo, 3c; Argentum, 36½c.; Anaconda, 50c.; C. C. Con., 6½c.; Elkton, 96c.; Gibson, 38½c.; Fleece, 25c.; Grouse, 4½c.; Isabella, 25½c.; Jefferson, 8½c.; Pharmacist, 9½c.; Portland, 50½c.; Mt. Rosa, 7½c.; Union, 14½c.; Work, 4½c.

#### San Francisco.

June 5.

(From Our Special Correspondent.)

The market opened very quietly after the holiday on Monday. Prices were not perceptibly lower, but dealings were very light. The weekly reports from the Comstock were not of a nature to cause any excitement, and there seemed to be just enough interest in the trading to prevent any marked fall in quotations.

The quotations could not be kept up long on such small business and they broke down gradually, the week closing dull and quiet, with a downward tendency. The only stock which seemed to retain any strength at all was Chollar, which still kept most of its recent advance.

Some closing quotations were: Consolidated California & Virginia, \$1.70 @ \$1.75; Chollar, \$1.10 @ \$1.15; Confidence, 90c.; Ophir, 80 @ 82c.; Hale & Norcross, 76 @ 78c.; Potosi, 65 @ 66c.; Best & Belcher, 50 @ 53c. A little was done in Standard Consolidated at a lower figure than last week, \$1.40 @ \$1.45.

The Supreme Court of Nevada, at Carson, has decided the Hale & Norcross case in favor of the Grayson board of directors. Mandamus proceedings were brought by Joseph R. Ryan, the Grayson appointee as superintendent of the mine, to remove

James Cronan, who held the position under the Fox directors. The Court ordered the writ to be issued and Mr. Ryan put in position. Anticipating the decision of the Supreme Court, the Fox directors ordered notices to be printed and posted on the hoisting works of the mine that the Fox management would not be responsible for any debts contracted by any one other than Cronan. They also ordered work to be practically suspended in the mine. In the proceedings brought by the Grayson directors in the Superior Court in San Francisco to remove the Fox directors from office and secure the books of the company, a hearing is now in progress before Judge Belcher.

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

	1896.	1897.
January, shares.....	296,415	274,280
February.....	183,790	166,695
March.....	246,105	188,715
April.....	264,735	239,765
May.....	181,610	189,335
Total.....	1,809,655	1,058,880

The sales in May, 1896, were the largest for any month in several years.

So far as made public, the following assessments will become delinquent at the respective offices in June: Alta Consolidated, 5c. per share, \$5,400; Alma, 5c., \$2,500; Anita, 5c., \$2,500; Bullion, 10c., \$10,000; Challenge Consolidated, 10c., \$5,000; Channel Bend, 3c., \$3,000; Chollar, 15c., \$16,800; Gould & Curry, 20c., \$21,600; Hexter, 3c., \$3,000; Justice, 5c., \$5,250; Numa, 5c., \$5,000; Occidental Consolidated, 10c., \$10,000; Reward, 2c., \$2,000; Rock Island, 2c., \$2,000; Union Consolidated Gold, 10c., \$3,000. The Alma, Anita and Union mines are in Amador County, Channel Bend is in Eldorado County, Hexter is in Calaveras County and Reward is in Nevada County, Cal., and the gross amount of the assessment in most of these cases is estimated for want of the number of shares in each taxable. The Numa mine is in Humboldt County, Nev., and all the others are in Storey County. If collected in full, the money will be apportioned as follows: Amador County, Cal., \$8,000; Calaveras, \$3,000; El Dorado, \$3,000; Nevada, \$2,000; Humboldt County, Nev., \$5,000; Storey, \$76,050; total, \$97,050.

#### Spokane, Wash.

June 5.

(From Our Special Correspondent.)

The week opened quietly and light bidding prevailed. While prices appeared to be hardening they are still rather low. Some stocks are better, however, and it does look as though the Exchange will again do an active business. Cariboo sold at 45½ @ 46c., as against 49c. at the close of last week. Noble Five Consolidated showed a transaction on June 4th at 44c., which is 16c. less than was asked for the stock on May 25th last. I understand that two more large blocks of this stock are offered for sale. Rambler showed dealings at 46c. early in the week, and although the asking price then was 50c. it closes at 47c. with no buyers. There has been heavy trading in Butte at 1½ @ 1½c. Novelty was in some demand and transactions were recorded at 2½c., which is a fraction higher than last week. Phoenix opened at 6½c. (selling price), rose to 16c. (asked) on the following day with dealings at 6½c. At the close up to 20c. was asked for this stock with no buyers. Poorman sold in fair quantities at 6 @ 6½c., against an asking price of 12c. today. The Poorman Mining Company held its annual election recently in this city, over 400,000 shares being represented. The officers elected were: President, Col. W. M. Ridpath; vice president, W. J. C. Wakefield; treasurer, C. F. Clough; secretary, Charles Liftchild. The trustees included these parties and E. D. Sanders, Major J. M. Armstrong and John A. Finch.

Some interest was felt in O. K., which dropped from 20c. a few weeks ago to 7c. on June 4th. Two large blocks of stock were offered, but buyers acted sparingly in taking it up.

#### London.

June 1.

(From Our Special Correspondent.)

No event of any great importance has occurred in the South African mining market during the past week. Bears have all covered, and nobody inclines to open a new speculative account. This week the races occupy Stock Exchange men; then comes the Whitsuntide holiday, and after that again there is the Jubilee. Something very unexpected will have to happen to cause any excitement in the city for some weeks to come.

Political events continue in favor of peace between the Transvaal and England. Dr. Leyds' visit to London is doing a great deal of good and it really appears as if he and the colonial office are beginning to have confidence in each other. It is said that many concessions are to be made to the mining interest, but on the other hand the Transvaal government has no idea of getting along with a diminished revenue. Therefore, they propose to make such alterations as will materially reduce the cost of working, and at the same time to impose a tax on net profits. This will have the effect of increasing the number of profitable properties, so that the individual burdens will be decreased.

Consolidated Goldfields have still been the most prominent part of the market. The recent issue of new shares was all taken up by present shareholders, and now the old and new shares rank equally. The price of the old shares has now dropped from



£8 to £4, as the rights to the new issue have expired. The report for the half year, ending with June, is looked forward to with considerable anxiety, for it is expected to explain the reason for having adopted the particular plan for the recent issue. It is also hoped that information will be given as to the future handling of the company's deep levels. As for the gold-producing mining companies, all the shares have advanced in price during the past fortnight, and there is every reason to expect that the rise will be permanent.

The West Australian market has been more lively than usual, on the strength of buying from Adelaide. This is a recurrence of the phenomenon which I have referred to in this column several times during the past year. I am inclined to think, and my opinion is backed by several who ought to know, that the orders are mostly fictitious and are engineered from this side. The buying is chiefly in shares of companies at Kalgoorlie, in Hannans district and most of the shares stand at very high premiums. This is not the sort of business that people in Adelaide go in for. The buying is not for permanent investment; and if it is speculative, it is of course controlled from London. The means used in this market for causing rises are rather predictions than dividends. A favorite mode of attracting attention is to announce the discovery of telluride ore. This is being picked out at a good many mines in Hannans district, but in no case so far have we been told in what quantity it occurs.

Of other sections Indians show the greatest amount of business, though as far as talk is concerned British Columbians attract most attention. A new British Columbia company comes out now and then, and I hear from several promoters that special efforts are to be made after the Jubilee in July to make a boom. The chief element for a boom, a paying mine, is wanting as yet. If we could get such a mine as the North Star at Fort Steele, and the solid men at the back of it transferred to a London company, there would be genuine ground on which to found a boom. The Le Roi or War Eagle would answer as well, if a reasonable capitalization were adopted. As it is, the companies floated here acquire rubbish claims which have been passed over by local buyers. This sort of thing cannot command success. The company advertised this week is the Waverley Mine, Limited, and it is the first offshoot of the Goldfields of British Columbia, Limited, to which I referred a few months ago. The capital is £100,000, of which £60,000 is the purchase price and £40,000 is to be the working capital. The property is the Waverley claim, in the Albert Canyon and Downie Creek group, situated at the north fork of the Illicillewaet River and Downie Creek, West Kootenay. Some development work has been done, showing that the vein passes through the claim and averages, it is said, at least 30 ft. wide. Messrs. Waterman, Pellew Harvey, James M. Kellie and Perry Leake all say that the ore is worth at least \$75 per ton, and the assay certificates give the value at anywhere from \$100 to \$1,000 per ton. The nature of the vein is not described in a very practical way; you only have to dip your hand in the lucky bag and you get gray copper, galena or horn silver as rich as you want it. Apparently they all occur together in the same vein, for all the assay certificates show gold, silver, lead and copper. If all this is true Mr. John Grant, the original vendor and developer, would have got more by selling the property locally than he is ever likely to get from the Goldfields of British Columbia, Limited.

Paris. May 30.

(From Our Special Correspondent.)

Much interest is still felt in the market for the Transvaal gold stocks here and in London. The sudden rise which began two weeks ago is hardly maintained, but there is still a much stronger feeling than for many months past, and people begin to hope that better conditions may be expected in South Africa, with a permanent gain in values. There seems to be at least some hope of reforms which will enable the companies to reduce their costs and increase their profits.

The copper stocks are in demand again, and Rio Tinto show a sharp advance. Boleo has made another gain, and the stock now sells at 1,975 fr., a price apparently justified by the report for 1896, which shows a gain of 2,000,000 fr. in earnings. The dividend for the year will be 93.75 fr., and the business for 1897 promises a still further gain. The company now occupies a very strong position.

Malfidano has been especially strong among the copper and lead companies. The net earnings for 1896 were 2,328,022 fr., an increase of only 24,176 fr. over 1895, and the dividend of 40 fr. will be the same. This, however, is because the company has been applying and charging off considerable sums to pay for its new Noyelles-Godault works, which have cost 3,173,000 fr. The management has set aside 714,380 fr. from the earnings of 1896 for these works. The improving price of spelter will benefit this company largely.

The Russian group of metallurgical stocks has been in demand, and the quotations are higher. Our own metallurgical stocks continue to show advances, and one cannot deny that there is apparent reason for their strength. Besides their already large orders for railroad and marine work and for war material, they are promised new demand from the rapid development of electric railroads which has begun here, after a long delay. This seems likely to give occasion for many orders for material.

We have not yet, in France, received any of those imports of iron and steel from the United States which seem to be causing the English and German iron-masters so much uneasiness. They affect to laugh at this trade, and to consider it spasmodic, the result of hard times; and they say that any increase of business this year will quickly stop the business. This seems doubtful, however, and some begin to recognize the importance of this new competition and to prepare to meet it. As to ourselves, we may call upon you for supplies before long if business continues to prosper here.

Political affairs are still in an unsettled state, but this seems to be less regarded in view of the other conditions affecting the stock market. AZOTE.

Rosslund, B. C. June 2.

(From Our Special Correspondent.)

The quietness in mining business reported last week continues. There is some disappointment because of the dullness in the sale of mineral claims. A year ago all kinds of claims sold readily. In the legitimate branch of the business the shipments of ore from the producers are steadily increasing. May closed with a showing of about 25,000 tons of smelting and milling ore for Trail Creek since January 1st. The increased activity reported in the Slocan country is attracting many of the newcomers.

The increase in fees for the incorporation of mining companies in this province is having a tendency to check the stocking of unworthy schemes, but the greatest check seems to have come from those who have been financially assisting this class of business, as the experience they have gained at much expense has had a wholesome effect.

#### MEETINGS.

Bethlehem Iron Company, annual meeting, at South Bethlehem, Pa., on June 2<sup>d</sup>, at 12 m.

Mining and Milling Company, annual meeting, at Colorado Springs, Colo., on July 6th at 7 p. m.

Bunker Hill & Sullivan Mining and Concentrating Company, annual meeting, at 501 Chamber of Commerce Building, Portland, Ore., on June 17th at 12 m.

Cortland Gold and Silver Mining Company, annual meeting, at 1644 Tremont street, Denver, Colo., on June 17th at 1 p. m.

North Mercur Gold Mining and Milling Company, annual meeting, at Room 46 Central Block, Salt Lake City, Utah, on July 5th, at 6:30 p. m.

Plutocrat Mining and Milling Company, special meeting, at Wudors Hotel, Denver, Colo., on June 21st, at 7:30 p. m.

Utah mine, special meeting of the stockholders, at Room 411 McCormick Block, Salt Lake City, Utah, on June 22d, at 2 p. m.

#### LATE NEWS.

MR. RICHARD EAMES, JR., of Salisbury, N. C., the well-known mining engineer, is visiting in New York City.

WASHINGTON.—A new strike in a lease on one of the Washington properties, in Summit County, Colo., is reported. It is said that the lessees have over 2 ft. of good lead ore. This ore carries, in addition to the lead value, good values in both gold and silver.

TRI-STATE MINING AND DEVELOPMENT COMPANY.—This company, of Galena, Kan., has been incorporated with a capital of \$300,000. The following Galena citizens comprise the board of directors: J. W. Tate, R. R. Valfer, R. B. Waten, Wm. R. Foley and R. J. Balch.

RUEFLY-RAVEN.—A good strike of copper glance has been made in this mine, at Aspen, Colo. The mineral at the point where it was struck is 2 ft. thick and is rich. The entire vein has been opened along the hill for a considerable distance and at the point where the new strike was made is 15 ft. deep.

MOON SPRING GULCH PLACERS.—Reports received from Redfern, S. Dak., state that near Moon Spring Gulch, where, in 1877, more than \$200,000 in placer gold was taken out, there have been made very rich finds. The free gold in the quartz is said to exceed the best discoveries so far made in the Black Hills.

BONDY.—It is reported that the pay streak of this lode, in the Pollock mining district, Colo., has widened to 2 ft. and considerable ore is being taken out. The shaft is about 35 ft. deep. The ore is copper pyrite, carrying about 4 oz. in gold. The property is being developed by the owners, who hail from Aspen, Colo.

AMERICAN MINING AND TRUST COMPANY.—This company, of Evanston, Wyo., has forwarded its incorporation papers to the Secretary of State. The object of the company is to carry on general mining and milling business and do a general merchandise

business. The capital stock is \$25,000 and the trustees are H. H. Rea, J. K. Schenck, J. Schenck and J. C. Mam. The principal place of business is Evanston.

NEW YORK & WESTERN MINING COMPANY.—The manager of this company, operating in the mountains about 17 miles from Saratoga, Wyo., reports the discovery of a rich vein of gold ore 10 ft. wide, with a pay streak of 4½ ft. The ore yields about 2 oz. to the ton. The owners will at once let contracts for several thousand feet of tunneling on the vein, and will commence shipments of the ore to Denver.

SULTANA.—This mine, in Summit County, Colo., is shipping a number of cars of iron sulphide weekly, under the management of Lessee A. H. Boyd. The mine has maintained regular heavy shipments for months. It is probable that a diamond drill hole will be put down on the property before long. It is the general impression that there is a second contact within 500 ft. of the level of the present workings.

REND COAL MINES.—The strike at these mines, near Pittsburg, has been declared off and a satisfactory compromise made. President Dolan, of the United Mine Workers, arranged matters with Colonel Rend, whereby the reduction from the 60c. rate to the 54c. rate was accepted by the miners. Colonel Rend agreed to reduce the price of the coal sold to the miners and also to bring their house rent down considerably. The wages of the day workers will remain the same as were paid, at the 60c. rate.

SUMMIT VALLEY PLACER COMPANY.—This company, in Prairie basin, 30 miles southwest of Leesburgh, Idaho, has some 15 men at work, and John Beck and C. W. Stayner have put in a dredging plant on Big Creek, where they have stream tin in pebbles ranging from the size of small shot to as large as hens' eggs, which assay about 50% tin and some gold. This output is sent East for smelting. It is said they get about one pound of the nuggets to the cubic yard of dirt, and it is only 10 to 13 ft. to bedrock. The plant was put in last year, and is now being enlarged, and will resume operations shortly.

[BY TELEGRAPH.]

(From Our Special Correspondent.)

LEADVILLE, COLO., June 11.—The Yankee Doodle mine, on Carbonate Hill, near this city, has just been sold to an Eastern syndicate, the deal having been closed to-day. Neither the purchase price nor the names of the buyers have been made known, but it is understood that the price was in the neighborhood of \$100,000. The Yankee Doodle mine is well known as a big lead-carbonate producer, as it has already yielded over one-half million dollars to its old owners, the Carbonate Hill Mining Company.

HERCULES.—This mine, near Burke, Idaho, is about to commence shipping ore, the snow being off from Tiger Mountain enough to make it accessible. There is no road to the mine, so a pack train will be put on and some of the richest of the ore will be brought down in that way. Two men are now stopping in 4 ft. of chloride ore, which is high grade, said to run from 80 to 350 oz. in silver, 50 to 60% lead and a little gold and copper. It is situated on the side of Tiger Mountain, above the head of Gorge Gulch. A little over a mile of road will have to be built to connect with the road already built from East Burke up that gulch for a considerable distance.

GOLD CREEK-NEVADA MINING COMPANY.—This company is operating in the Gold Creek region in Nevada. According to Mr. H. J. Mayham, of Denver, Colo., one of the directors, who has just returned from the properties, the company is putting \$500,000 into the district. They own 11,000 acres of placer ground and 50 lode prospects, in addition to the townsite of Gold Creek, which now has a population of 500. They have put \$100,000 into a reservoir to furnish a water supply for the placer workings and have 20 miles of ditches in place. It is intended to set up an electric plant to furnish light for the town and power for the mines. For the past six months the company has had from 200 to 400 men at work on its improvements.

SULLIVAN GROUP MINING COMPANY.—The final cash payment has been made on the Sullivan group, in the Fort Steele country, B. C. It was \$8,400, and was paid to J. W. Cleaver, Walter Burchett and E. C. Smith, who located the group in August, 1892. This property, which includes the Hope, Hamlet and Shylock claims, is owned by the above company, having a membership chiefly of the principal owners of the Le Roi. After the payment a meeting of the company was held in the Le Roi offices, and steps were taken for the immediate crown-granting of the property. Men have been set to work sinking on the ore body, building a wagon road and erecting buildings. A report from the mine says they are sinking on good, fine ore. It is a silver-lead proposition. The company is considering the building of a steamer to transport its own ores and supplies.

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 daily price movements from June 5 to June 11.

COAL AND INDUSTRIAL STOCKS.

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

\*Official quotations New York Stock Exchange, mining 450 shares; other stocks, 65,339 shares; Consolidated Stock and Petroleum Exchange, mining, 9,310 shares; mining exchange, 119,700 shares. Total shares sold, 201,783. \* Bid and ask quotations.

PITTSBURG, PA.\* Week ending June 8.

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

\* Official quotations Pittsburg Stock Exchange.

PHILADELPHIA, PA.\*

Table of stock quotations for Philadelphia, PA, listing companies like Cambria Iron, Choc. & Gif. Cfts, and others with columns for location, par value, and daily price movements.

\* Official quotations Philadelphia Stock Exchange. † Bid and asked quotations. Total sales, 3,185.

BOSTON, MASS.:

Table of stock quotations for Boston, Mass., listing companies like Aetna Con., Allouez, and others with columns for location, par value, and daily price movements.

\* Official quotations Boston Stock Exchange. \* Bid and ask quotations. Total sales, 39,591. † E.-dividend.

BALTIMORE, MD.\* Week ending June 10.

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

\* Official quotations Baltimore Stock Exchange.

CLEVELAND, O.

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

BUTTE, MONT. June 4.

Table of stock quotations for Butte, Mont., listing companies like Am. Dev. & M., Bald Butte, and others with columns for par value, bid, ask, and daily price movements.

HELENA, MONT.\* Week ending June 3.

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, par value, bid, asked, shares sold, and price.

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

SAN FRANCISCO, CAL.\*

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

\* Official telegraphic quotations, San Francisco Stock Exchange.



STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colorado, listing companies like Etina Gold, Alamo, Anacoonda, and others with columns for par value, bid, asked, and sales.

SPOKANE, WASH.

Table of stock quotations for Spokane, Washington, listing companies like Butte, Carbide, Celtic, and others with columns for par value, bid, asked, and sales.

\* Official quotations Spokane Stock Exchange. \* Selling price. Shares sold. Listed, 46,240; unlisted, 2,000; total, 48,240 shares. † Holiday.

ROSSLAND, BRITISH COLUMBIA.

June 3.

Table of stock quotations for Rossland, British Columbia, listing companies like Alberta, Big Tree, Blue Bird, and others with columns for name, par value, and selling price.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colorado, listing companies like Alamo, Anacoonda, Arg'ntum, and others with columns for name, par value, bid, asked, and sales.

\* Official quotations Colo. Springs Mining Stock Assoc. † Holiday. Total shares sold: Listed, 295,625; unlisted, 93,000.

SALT LAKE CITY, UTAH.

Week ending June 5.

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Alliance, Anchor, and others with columns for name, par value, bid, asked, and actual selling price.

\* Special Report of James A. Pollock. † All the companies are located in Utah.

MEXICO.

Week ending June 2.

Table of stock quotations for Mexico, listing companies like Alhazna, Amistad y Concordia, and others with columns for name, state, no. of shares, last dividend, last assessment, opening, and closing prices.

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

STOCK QUOTATIONS.

LONDON. May 28. Table with columns: NAME OF COMPANY, Country, Authorized capital, Par value, Last dividend, Quotations (Buyers, Sellers).

PARIS. Week ending May 28. Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Div. last year, Prices (Op'n'g., Closing).

VALPARAISO, CHILE. Apr. 10. Table with columns: NAME OF COMPANY, Location, Capital paid, Sh. Val. paid up, Last Dividend, Prices (Bld., Asked, Last sale).

SHANGHAI, CHINA. May 7. Table with columns: NAME OF COMPANY, Country, No. of shares, Value (Par, Paid up), Last dividend, Price.

\*Ex-dividend. †Dividend pending. ‡Reconstr or increase of capital pend. †Rights pend.

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

DIVIDENDS.

Table with columns: NAME OF COMPANY, Current Dividends, Paid since Jan. 1, 1897, Total to date, NAME OF COMPANY, Current Dividends, Paid since Jan. 1, 1897, Total to date.

ASSESSMENTS.

Table with columns: NAME OF COMPANY, Location, No., Dlnq., Sales, Am.

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. \* May dividend paid.

\* New assessment.



DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: 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). Contains two columns of data for Dividend-paying and Non-dividend-paying mines.

G. Gold. S. Silver. L. Lead. C. Copper. B. Borax. \* Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends and the Cons. Virginia \$42,390,000. § Dividends paid since consolidation. ¶ Bodie, Bulwer and Mono transferred to Standard Cons., January, 1897. ¶ Dividends have not been paid in several years. Note.—This table is corrected up to June 1. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

RARE ELEMENTS, CHEMICALS AND MINERALS—CURRENT PRICES.

NOTE.—This table is revised up to June 8th. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.

CHEMICALS AND MINERALS.

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

Table listing prices for various chemicals and minerals including Abrasives, Acids, Alum, Aluminum, Ammonia, Ammonium, Argols, Arsenic, Asbestos, Asphaltum, Barium, Barytes, Bauxite, Benzene, Borax, Bromine, Cadmium, Calcium, etc.

Table listing prices for various minerals and raw materials including Cement, China Clay, Chrome Ore, Cobalt, Copper, Feldspar, Fuller's Earth, Gypsum, Kaolin, Lead, Lime, Magnesite, Manganese, Marbles, Mercury, Mica, Mineral Wool, Nickel, Oils, Petroleum, Pyrites, Quartz, Salt, etc.

Table listing prices for various refined and processed materials including Petroleum, Paints, Benzoin, Marbled, Chrome, Green, Yellow, Litharge, Ocher, Shellac, etc.

Table listing prices for various rare elements and their compounds including Silica, Silver, Sodium, Strontium, Tellurium, Tin, Uranium, Vanadium, Zinc, Zirconium, etc.

THE RARE ELEMENTS.

Table listing prices for rare elements and their compounds including Argon, Barium, Beryllium, Boron, Calcium, Cerium, Chromium, Cobalt, Cesium, Didymium, Erbium, Gallium, Germanium, Glucinum, Helium, Iridium, Lanthanum, Lithium, Molybdenum, Niobium, Osmium, Rhodium, Rubidium, Ruthenium, Selenium, Strontium, Tantalum, Thallium, Thorium, Titanium, Uranium, Vanadium, etc.