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A tribute to a mining superintendent, which is almost unique of its kind, will soon be erected in the town of Irwin in Pennsylvania. It is in memory of John F. Wolf, for 16 years in charge of the mines of the Penn Gas Coal Company.

The German Engineers' Society has started a movement to secure a correct technical dictionary, in German, French and English. It has addressed communications to the leading technical societies in other countries, asking for their co-operation.

If, as a French contemporary estimates, the development of the phosphate deposits of Algeria and Tunis, and the construction of railroads to serve them is proceeding so rapidly that the supply from that source may easily exceed 500,000 tons yearly in a short time, and may reach 1,000,000 tons, the result to our own phosphate mines may be of great importance.

The article by Mr. Octave Chanute, which we publish on another page, has reference directly to the preservation of railroad ties, but it applies equally well to the treatment of mine timbers. Mr. Chanute is an engineer of high reputation, and he has devoted a number of years' study and work to the question of the preservative treatment of timber.

The latest boom in mining stocks in London is in "Ashantis," as the companies organized to operate on the Gold Coast in Africa are called. The existence of gold there has been known ever since the country itself was known to Europeans, and mining has been carried on in a small way for years past by the Wassau and other companies.

The boom, apparently, has some foundation, and there is little doubt that gold can be worked successfully if found in quantity. The most important report from the Coast is that a syndicate which has been quietly conducting explorations by boring for some time has discovered a formation very similar to the banket deposits of the Witwatersrand.

The drawbacks to the new field are the lack of transportation and the pestilential climate. The former will be overcome by the new works now under construction; the latter can hardly be remedied. At the best it will be a year or two before the new field can become generally known.

The fatal accident at Berrysburg in West Virginia, which is reported in our news columns this week, calls attention once more to the remarks made by State Mine Inspector John W. Paul at the time of the

accident at Red Ash in March last. There can be no doubt that the mining laws of West Virginia are defective or insufficient, and that they need both a thorough revision and strict enforcement. The coal mining industry of the State has already attained large proportions and is increasing rapidly, so that the old lax regulations mean continual danger to a large number of workmen. It is sometimes said that interest in their property should lead mine-owners to take all necessary precautions; but experience everywhere has shown that this is not the case. They will take risks—as all of us are inclined to do—and do not learn by the experience of others. The law-making power must either make and enforce strict codes of rules for the protection of miners; or must provide—and this is perhaps the better way—for their liability in heavy damages in all cases of death or injury which cannot be proved very clearly to be the result of the miners' own carelessness. The unavoidable payment of such damages would probably do more to promote care in operating dangerous mines than any code.

The Concessions Commission, which was appointed to take testimony in relation to the various monopolies established and concessions granted by the late Government of the Transvaal, has so far been busily at work. Most of the evidence thus far submitted has had relation to the Netherlands Railway Company, which built and operates the railroads under an exclusive charter. It is shown that the company during the war went far beyond what it was obliged to do, and was one of the most active supporters of the Boer operations. It is claimed that this will justify the British Government in revoking the charter of the company, without regard to the stockholders.

To say nothing of the probability that foreign governments, whose subjects are stockholders in the Netherlands Company might protest against any such summary action, Great Britain is hampered by a precedent, to which the London "Economist," a very careful and conservative paper, calls special attention. The Jameson raid was an act, not of disguised, but of open hostility, against a foreign power, but, though proved to be so, Great Britain did nothing to bring the Chartered Company to book for its offense. It might have been punished by voiding its charter, but that, it was held, would be to punish innocent shareholders for unauthorized acts of directors and employees. Should the British Government be asked why it should not extend the same consideration to stockholders of the Netherlands Railway Company, what can it reply?

#### BRITISH IRON AND STEEL PRODUCTION IN 1900.

The figures collected by the British Iron Trade Association for the half-year ending June 30th show that the total production of pig iron in the United Kingdom during that period was 4,540,403 long tons. In the first half of 1899 the total was 4,782,868 tons, so that the present year showed a decrease of 242,465 tons, or 5.1 per cent. The decrease was chiefly in Scotland, Durham and the Cleveland District; the West Cumberland furnaces, which make chiefly Bessemer pig, showed a slight gain, and the changes in the other districts were not important. In Scotland—and to a somewhat less extent in the Cleveland District—the falling off was due to the high price of coal, which caused several furnaces to go out of blast. The total production this year was divided as follows: Forge and foundry iron, 2,139,468 tons, or 47.1 per cent. of the total; Bessemer or acid steel pig, 1,949,324 tons, or 43.0 per cent.; basic pig, 451,611 tons, or 9.9 per cent.

The total production of steel for the half-year was 2,663,102 long tons, the largest quantity ever reported for a similar period, though the increase over last year was small. The steel output was divided as shown in the table below, in which comparisons are made with the first half of 1899; the figures are in long tons:

	1899			1900		
	Basic.	Acid.	Total.	Basic.	Acid.	Total.
Open-hearth .....	137,921	1,443,338	1,581,319	110,866	1,513,957	1,624,823
Bessemer .....	257,003	748,919	1,005,922	278,593	759,686	1,038,279
Totals .....	394,924	2,192,317	2,587,241	389,459	2,373,643	2,663,102

The total increase in the production of steel ingots was 75,861 tons, or 2.9 per cent., the gain in open-hearth metal being 43,504 tons, or 2.8 per cent., and in Bessemer 32,357 tons, or 3.2 per cent. The proportions of each kind of steel varied but little from last year, open-hearth steel being 61.0 per cent. of the total this year and Bessemer 39.0 per cent., while last year the percentages were 61.1 and 38.9 respectively. The basic processes fell behind a little, as acid steel shows a gain of 81,326 tons, or 3.7 per cent., while there was a decrease of 5,465 tons, or 1.4 per cent., in basic steel. This decrease was in basic open-hearth metal entirely, basic Bessemer showing a gain.

The Association returns of finished steel are not quite complete. So far as they go, they show a total for open-hearth steel of 698,046 tons of plates and angles, 284,869 tons of bars and merchant steel and 213,570 tons of blooms, billets and wire-rods; in all 1,196,485 tons. The balance

was made up of castings, forgings, tires and axles, with a very small proportion of rails. Bessemer steel, as usual, furnished nearly all the rails made, the total being 381,149 tons; this compares with 417,073 tons in 1899, showing a decrease of 35,924 tons, or 8.6 per cent., this year.

#### THE READING ANTHRACITE REPORT.

The publication of the report of the Philadelphia & Reading Coal and Iron Company for the year ending June 30th, 1900, enables us to illustrate from its figures some remarks made in connection with the strike of the anthracite miners. A full and careful analysis of this report will be found in another column. Its statements are not so full and explicit as might be desired, but they still furnish some interesting facts.

The company is the largest and most important in the anthracite region. In the year under review its sales of anthracite coal reached a total of 9,379,427 long tons, or approximately one-sixth of all the anthracite sold. Its mines are on the average nearer to tidewater than those of any other of the great companies. There are a number of large towns on the lines, and upon the whole the company's property is favorably placed.

The property of the Coal and Iron Company is charged on its books at \$87,384,978, of which coal and timber lands stand for \$61,678,138; colliery improvements, machinery and dead-work, \$13,092,635; buildings and coal depots in various places, \$2,799,459, and investments in controlled companies, \$9,814,746. For a series of years the company not only failed to earn any interest on this investment, but showed an actual deficiency. Last year was an unusually favorable one to the anthracite industry, the production and sales being large and prices generally well maintained. In that year the gross earnings of the company reached the great sum of \$27,884,644; but working expenses reached a proportion of 95.8 per cent. of the earnings, in spite of the favorable conditions. The net earnings, after deducting the operating expenses, were only 1.37 per cent on the investment; and after deducting interest on bonds and mortgages charged on the company's lands, there remained only a balance equivalent to 0.85 per cent. An industry which returns less than 1 per cent. in a prosperous year can hardly be called a profitable one. What it has been in past years is shown by the entry in the balance sheet of \$78,653,649 due the Reading Railroad Company for advances made. That is, the Reading has put nearly \$80,000,000 into its coal property, and has received in return practically only such profits as it may have made on the carriage of the coal over its lines. This situation is typical of the entire anthracite trade. With the exception of two or three companies, whose lands were bought very cheaply in the early days of the industry, the profits have been made entirely by the transportation companies, and by the agents and middlemen who handle the coal at the distributing centers.

The analysis given of the accounts of the Reading Company shows that the average price received for its coal last year was \$2.91 per ton. Had all the coal been carried to tidewater, this average might have been somewhat higher, but a large quantity of the coal was sold at or near the mines, or at local points on the railroad lines. The operating expenses were \$2.79 per ton, of which the average of \$1.67, or 59.9 per cent., represents the cost of mining and preparing the coal, and \$1.12, or 41.1 per cent., the cost of transporting and selling it. Adding some miscellaneous receipts, the net earnings represent 12.8 cents per ton on the coal sold; or deducting the interest charges, which properly belong in the expenses, the balance is 7.9 cents a ton. The averages of selling prices and costs approximate so nearly to those which we have been able to obtain from the reports of other companies, that they may be accepted as fairly representative of the whole anthracite region. As such they possess much interest.

#### SOME CHANGES IN THE AMERICAN ZINC INDUSTRY.

Certain commercial and technical changes which are now taking place in the American zinc industry are of great importance. One of these is the predominance which the natural-gas smelters of Kansas have gained decidedly over those which are dependent on coal fuel. The other is the rapidly increasing supply of Colorado zinc ore. Both these developments affect the zinc producers of the West rather than those of the Eastern and Southern States.

The chief points for smelting the ore of the Joplin District used to be Lasalle and Peru in Illinois, St. Louis, Mo., and the vicinity of Pittsburg, Kansas, Lasalle-Peru and St. Louis were zinc smelting centers before the Joplin mines were worked for zinc. Pittsburg, Kan., owed its development to the productive coal measures over which it is built, and being only 26 miles from Joplin, with excellent railway connections, it became naturally an advantageous place for smelting the ore mined at and near Joplin. About five years ago the natural gas supply in the vicinity of Iola, which by railway is approximately 100 miles from Joplin, began to be used for zinc smelting and since then numerous

works have been erected at that point. The experience has demonstrated that zinc ore can be smelted more cheaply at Iola, under the conditions which exist there, than at Pittsburg, Kan., and gradually the coal smelters have been closed, though this result did not take place in a marked degree until the present year. In 1899 the conditions of the ore and spelter market were such that even the Iola smelters were unprofitable. With 1900 the unfavorable conditions were ameliorated, but the increasing competition of the Iola smelters, of which the largest had previously been consolidated in strong hands, prevented the price of ore from falling to the former level and few of the coal smelters of Kansas and Missouri have been able to meet recent prices, especially under the further disadvantage of the increased price for coal which has prevailed during the current year. Thus the works at Joplin, Mo., and Weir, Kan., have been closed, while out of the five works at Pittsburg, only one is in operation and that one at but half capacity. The coal smelters of the Lasalle-Peru and St. Louis districts, however, because of the magnitude of their works, good management and other advantages, have been able to withstand the competition of the Iola works.

In the closing of the Pittsburg works, and the others of which they are a type, the metallurgical industry loses one of its most picturesque features, inasmuch as the irregular groups of buildings, with their high peaked roofs and quaint gables, and chimneys belching flames that made a far-seen landmark on the prairie at night, will soon become a thing of the past. With idleness a zinc smeltery rapidly goes to pieces and probably the Pittsburg works will never be started again for any but spasmodic campaigns. In the ordinary course of events the natural gas at Iola and elsewhere will be exhausted some day and even before it is wholly consumed it will begin to assume an expense increasing gradually up to the point where it will be more costly than coal, and with the arrival of that time Pittsburg may become a smelting center once more, but it will be, no doubt, with new furnaces and new appliances.

With respect to the increasing competition of Colorado zinc ore, it has been known for many years that that State possesses vast resources of mixed sulphide ore, most of it argentiferous, and some of it rather high in zinc, but still mixed with sufficient lead and iron to make it undesirable material for the zinc smelter. Rather more than ten years ago a small zinc smeltery was erected at Denver, but after a few months' operation came to grief on account of the refractory character of the only ore that was then available. Since that time, however, such progress in the art of separating difficult minerals by wet concentration has been made that it has now become possible to turn out a zinc product which certain zinc smelters are able to buy and reduce successfully when mixed properly with other ores.

In 1899 some of the smelters of Kansas and Missouri purchased considerable lots of such Colorado concentrates as were better than the average, but the chief trade in that material has been developed with smelters in Wales and Belgium, who have during the last year purchased many thousand tons from Colorado miners. This trade has been made possible largely by the favorable freight rates which have been obtained, the ore being carried from Leadville via Galveston to Swansea or Antwerp at a cost of less than \$10 per ton of 2,000 pounds. The miners receive comparatively little for the material, \$5 per ton being the usual price, but inasmuch as their zinc concentrates are purely a by-product and the value of the remainder of the ore is increased by their removal, the miners can very well afford to sell them even at so low a price as \$5 per ton. The fact that a market for such material has been established has excited general attention in Colorado and steps are now being taken to increase largely the milling capacity. At the same time experiments are being made with the Wetherill magnetic separator and other special processes with a view to the more profitable development of the zinc resources of the State. The characteristic enterprise of Colorado mining men and the success with which they have mastered difficult problems in the past leads us to believe that they will master this one now that their interest has been fairly enlisted in it.

It is difficult to estimate just what effect the growth of the Colorado zinc industry will have upon zinc mining in the older established districts. The indications are, however, that it will tend to cause a lower range of prices, especially for the least desirable ores, since the smelters will be apt to substitute for them the cheaper material from Colorado. The zinc smelters of Europe being able also to obtain such large supplies of cheap ore from the United States, ought to be better able to forestall exports of spelter from this country, although the phenomenal increase in the exportation of spelter from the United States in 1900 does not indicate that any such effect has yet been experienced. It must be admitted, however, that the present conditions as to fuel and labor in Europe are abnormal, and will not be permanent; but while they last the cost of producing spelter there will be so high that a supply of cheap ore will be gratefully received.

## NEW PUBLICATIONS.

"Western Australia. Report of the Department of Mines for the Year 1899." H. S. King, Under Secretary for Mines. Perth, W. A.; Government Printer. Pages, 286; with maps and diagrams.

As usual, this report contains, in addition to the statistics for the year, many details in relation to the different districts and, to individual properties. The statistics are illustrated by diagrams in many cases. Gold is the chief mining interest; but in addition there were 54,336 tons of coal mined, and also small quantities of copper ore, tin ore, lead ore, mica and asbestos. Iron ore and limestone for flux are reported in considerable quantities. It is believed that the tin production can be considerably extended. In addition to the mining returns, some account is given of the operations of the new Mint at Perth.

"De l'Accaparement." By Francis Laur. With a Preface by Edmond Thery. Paris, France: Societ  des Publications. Pages, 350. Price (in New York), \$2.75.

M. Laur—who is a man of immense activity, being a mining engineer, editor of "L'Echo des Mines," and a member of the Chamber of Deputies—has, nevertheless, found time to collect a mass of information in this book on the question of Trusts. With a French tendency to generalization he has attempted to define the Trust exactly and to arrange the great commercial and industrial combinations of the present day in these classes according to their extent, importance and the classes of products which they control or seek to control. He presents many documents and statistics in relation to the combinations affecting the production and marketing of petroleum, steel, quicksilver and borax; the coal and coke syndicates of Germany, and the great American companies. He goes with much detail into the legislation affecting trusts in the United States and Austria, especially since France, Great Britain and Germany have hardly touched the question by legislative action as yet. He discusses, in brief, the modern tendency to consolidation in trade and great aggregations of capital.

M. Laur is independent and aggressive, and has a clear and lively style which will command interest and attention whether the reader agrees with his conclusions or not. M. Thery is an eminent authority on economic questions, and his preface will carry weight.

"Les Minerales Utiles et leurs Gisements." By Henri Charpentier. Paris, France: Veuve Ch. Dunod. Pages, 644; with 115 illustrations. Price (in New York), \$4.20.

This volume, which is one of the series prepared under the direction of the Ministry of Public Works on applied geology, is a study of the occurrence of the useful minerals, with special application to France, though the mineral deposits of other countries are not neglected. It is meant for the use of mining engineers, miners and prospectors, and is intended to give in compact form information which will be useful both to those who are searching for mineral deposits and to those who are engaged in their exploitation. The first part, or introduction, consists of a condensed summary of general geology with the elements of mineralogy and of paleontology so far as it bears on mineral deposits.

The second and chief part of the book takes up the subject of mineral deposits, the first chapter being a general geological study of such deposits. The other chapters treat in succession of materials of construction, such as rocks, slates, cements and the like; of mineral employed in metallurgy, such as ores of iron, copper, lead, zinc and other useful metals; of coal and the hydrocarbons; of minerals used in agriculture, such as phosphates; of minerals employed in different industries, such as barytes, clay magnesite, etc.; of the rare metals; and of gems. Each chapter gives a general account of the minerals referred to, their properties, uses and the forms under which they occur. To each is appended a bibliography, giving a list of books and papers on the special topic. These lists have been carefully brought up to date, and are a valuable addition to the work. M. Charpentier's studies are largely based upon examinations of actual deposits and their working, so that he can quote many examples of actual practice in exploring and mining.

## BOOKS RECEIVED.

In sending books for notices, 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.

"Obsequio de Heckelmann & McCann." Mexico; issued by Heckelmann & McCann. Pages, 280.

"Fifth Annual Report of the Public Lighting Commission of the City of Detroit, Michigan. Detroit; published by the City. Pages, 80; illustrated.

"The American Trade Index; Arranged for the Convenience of Foreign Buyers." Philadelphia; the National Association of Manufacturers. Pages, 672.

"Minerals from Nova Scotia for the Paris Exposition." By E. Gilpin, Jr. Halifax, N. S.; published by the Nova Scotian Institute of Science. Pages, 24.

"Lehre von den Erzlagern." By Dr. Richard Beck. Berlin, Germany; Gebruder Borntraeger. Pages, 384; with 255 illustrations. Price (in New York), \$3.50.

"Geological Survey of New Jersey. Annual Report of the State Geologist for 1899." John C. Smock, State Geologist. Trenton, N. J.; State Printers. Pages, 328; illustrated.

"Indiana: Department of Geology and Natural Resources. Twenty-fourth Annual Report." W. S. Blatchley, State Geologist. Indianapolis; State Printers. Pages, 1,078; illustrated.

"Thirteenth Annual Report of the Bureau of Industrial and Labor Statistics of the State of Maine, 1899." Samuel W. Matthews, Commissioner. Augusta, Me.; State Printers. Pages, 184.

"Auriferous Otago: Our Dredges and What they are Doing." Reprinted from the Dunedin "Evening Star." Dunedin, N. Z.; Joseph Braithwaite. Pages, 48; illustrated. Price (in New York), 35 cents.

## 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 will only 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 Lixiviation of Gold in Vegetation.

Sir:—I read some time ago in the "Engineering and Mining Journal" an interesting article on the "Lixiviation of Gold in Timber." I send you as an example a cane in which is manifested what has been so well explained in your valuable paper. The cane is made of a wood called here by the Creoles "man-barklak," by the Indians of this district "kakaralli," and by botanists "Lecythis Idatimon." The tree grows everywhere in this colony, as well in the alluvial plains as on the mountainous regions, and is considered by engineers the best timber for water works, and the best fitted to resist the destruction of pile-worms.

It is remarkable, however, that the trees found on the low lands are all of an even brown color, and not spotted. Even those trees growing in the mountainous regions, and consequently on the gold-fields, are generally of the same character.

In felling trees for fuel on the L. & F. de Jong's Gold Mine, of which company I am the director, it was observed that the timber, from a certain hill with exceedingly rich auriferous gravel, was spotted, and when polished had every resemblance of being gilded.

I must remark, however, that these trees, though growing in abundance in many places, have been found up to the present time in this spotted condition only on the De Jong placer.

Paramaribo, Dutch Guiana, Oct. 22, 1900.

Julius E. Muller.

## Vanadium and Its Alloys.

Sir: I see this metal mentioned in your issues of September 1st and 22d. The deposit of vanadium in Colorado will, I think, be found to contain this metal in a form difficult to utilize. The use of vanadic acid for dyeing has declined, because the black, for the production of which color it was used formerly, can now be made much cheaper from other substances. The future use of vanadium seems to be as an alloy of steel and other metals, the tensile strength of which are greatly increased by the admixture of a very small quantity of vanadium. For the manufacture of high-speed steam engines, pneumatic machinery, hauling ropes for deep mines, etc., material of much greater strength than any steel now made is required, and for these purposes the future use of vanadium is recommended.

The difficulty of using vanadium as an alloy of metals has been two-fold in the past, the price of the metal was prohibitive, and its very high melting point made it impossible to alloy steel or copper with pure vanadium by the ordinary plant of a steel-founder or copper refiner. The Alloys Syndicate of London, England, has lately manufactured ferro-vanadium on a commercial scale and offered it to the trade at a comparatively low price, and in a form which enables any steelmaker to use vanadium as an alloy which, it is claimed, more than doubles the elasticity of steel and nearly doubles its tensile strength. This ferro-vanadium will readily alloy with steel in any of the ordinary furnaces in use, while pure vanadium would not melt and, therefore, would not mix with steel, except at a temperature only obtainable in an electric furnace of special construction. I do not think that vanadium or ferro-vanadium has ever been made elsewhere on a commercial scale. W. London, Oct. 22, 1900.

## Experiments with Titaniferous Ores.

Sir:—I have just returned from Niagara Falls, where I have been this summer manufacturing ferro-titanium on a large scale, having made some 20 tons of the alloy varying in percentage of titanium from 10 to 75 per cent. We have sent our products to some of the largest car-wheel manufacturers, prominent steel works and foundries here and abroad, where the product is now being tested to its full merit. I read in your issue of October 20th under the heading "Treating Titaniferous Ores," a paragraph which, it is stated, as an extract from "the Ontario Assay Office." It is entirely misleading and justifies me in asking you to set matters in their proper light.

There is a company incorporated for the manufacture of ferro-titanium under the name of the Ferro-Titanium Company. Mr. James McNaughton, of New York, is its president and treasurer; General Edmund Hayes of Buffalo, is its vice-president, and among the incorporators figures Mr. J. J. Albright of Buffalo. The company has an office at 26 Cortlandt street, New York City; Mr. James McGuire is the secretary. This company has absolutely nothing to do with the Pittsburg Reduction Company. It is working under my patents for the production of ferro-titanium. It had a temporary plant in Niagara Falls, where I have manufactured enough of the alloy to supply present demands, while the company is preparing plans for a large contemplated plant.

The manufacture of the alloy has nothing to do with the "smelting of titaniferous ores" in the proper sense of the word which supposes a "blast furnace," nor was it necessary for me "to look for suitable flux" for these ores, as this question, if it ever arose, has been settled by the smelting of such ores in the Adirondacks for 20 years, for several years (6 or 7) in England, and more lately by my own practice, in which I used no other fluxes but those generally used for other ores; such as dolomitic limestone. Descriptions of this process have appeared in your own columns, "Report of the American Institute of Mining Engineers," Montreal meeting, February, 1893, and in papers read by me before the aforesaid society and the American Chemical Society. It is not thus at all a question of fluxes for these ores that I have been "experi-

menting" on, at Niagara Falls, but I have made an application, on an industrial scale of my methods for the manufacture of ferro-titanium at such a price as to render its use economical and possible even for seasoning cast iron, the value of the alloy for such purposes or for treating steel once thoroughly and firmly established and demonstrated by thorough and conscientious tests.

My work of a year ago, when I made about a ton of such alloys, was precisely intended to put the industrial application of said processes beyond question and justify our present and future steps.

If the writer of the "extract" had read the article of Mr. S. B. Archdeacon, which has appeared in your valuable paper, August 25th last, in which he gives a description of the Goldschmidt process for generating very high temperature, he would have seen that this process, invaluable for many purposes, such as welding among others, is impracticable industrially, on the score of cost, for the purpose of obtaining metals or ferro-metals at an acceptable price. Mr. Archdeacon mentions also (p. 220) "of what special interest to steel manufacturers is the production of titanium, containing from 10 to 25 per cent. of titanium, and free from carbon, small additions of this material giving the steel a particularly strong and fine-grained structure?"

It has been precisely the purpose of the Ferro-Titanium Company to obtain such alloys, considered as of such great value, at an industrial and low price. We have made, by our method, tons of this alloy, practically free from carbon and containing 10, 25, 35, 50 and 75 per cent. of titanium at a cost which, on the score of its aluminum alone, as used by Dr. Goldschmidt, is not one-tenth of that at which they can be obtained by his method.

It is not my intention for the present to give a detailed description of the manufacture and properties of these alloys and others which have been obtained by my processes, as it is intended to form the subject of some later communication.

New York, Nov. 2, 1900.

Auguste J. Rossi.

## THE LOWELL INSTITUTE LECTURES IN BOSTON.

The Trustees of the Lowell Institute maintains under the auspices of the Massachusetts Institute of Technology 20 free courses of lectures. These courses cover a wide range of subjects in pure and applied science as well as in literature. Each course is given by a member of the faculty of the Massachusetts Institute of Technology, and is carefully adapted to the needs, on the one hand, of teachers desiring to continue their studies; on the other hand, of men engaged in technical occupations for which they desire further scientific training.

The programme of these courses for the present year includes the following of interest to students of mining and metallurgy:

No. 3. Electro Chemistry.—Twelve lectures by Assistant Professor H. M. Goodwin, on Tuesday and Friday evenings, at 7.45, in Room 23, Walker Building, beginning November 6th.

No. 7. Gas Engines and Other Internal-Combustion Engines.—Twelve lectures by Professor Cecil H. Peabody, on Monday and Wednesday evenings, at 7.45, in Room 22, Rogers Building, beginning December 3d.

No. 8. Plane and Topographical Surveying.—Twelve lectures by Assistant Professor A. G. Robbins, on Monday and Friday evenings, at 7.45, in Room 21, Engineering Building A, beginning December 3d.

No. 13. Electro-Metallurgy.—Twelve lectures by Professor H. O. Hofman, on Monday and Thursday evenings, at 7.45, in Room 2, Rogers Building, beginning January 7th.

No. 19. Glacial Geology in Its Relations to Topography and in Its Bearings Upon the Work of Engineers.—Twelve lectures by Assistant Professor George H. Barton, on Tuesday and Thursday evenings, at 7.45, in Room 11, Engineering Building B, beginning February 5th.

BRITISH INQUIRY FOR STEEL.—United States Consul Marshal Halstead writes from Birmingham, October 18th, 1900, that he is in receipt of a communication from a steel-manufacturing company which contains an inquiry for American steel for making forks (hay, digging, coke, etc.), Siemens or Bessemer process, and requests the names of firms manufacturing high carbon steel of a suitable kind.

THE OCHER INDUSTRY IN FRANCE.—The extraction and preparation of ocher has been an industry in France for nearly two centuries, and that the supply of the world is almost wholly French, as French ochers are peculiarly rich in oxides of iron, and are prepared with exceptional care. Vaucluse is the main seat of the industry. The total production last year was about 18,000 tons, of which Germany took 7,000, Russia 4,000, and the United States 3,000 tons. The consumption in France itself is insignificant. Around Apt, in Vaucluse, which is the center of production, the country is dotted with hills of alluvial clay, all more or less rich in ore. Sometimes shafts are sunk, with radiating tunnels to reach the ochre, sometimes it is quarried. Owing to the expense of timber a large amount of the material remains in the mines in pillars, and all the operations are carried out in a very primitive manner. The clay is carted several miles to the valley below, and there washed, although buckets on overhead cables or some other gravity system could easily be introduced. The clay is mined in the winter only, the water-courses drying up in the summer; it is flooded with water and the ocher falls into settling basins. By means of a succession of basins various degrees of fineness are secured. At the end of winter the tanks, or basins, are filled with ocher in the form of heavy mud, which, when sufficiently dried as the hot weather advances, is cut into blocks of regular size and completely dried in the sun. Sometimes the mineral is shipped in bricks, but more often it is crushed into powder. The main difficulty is to secure uniformity in shade, as the deposits are of an infinite variety of colors, from dark red to yellow or gold, but the market value declines as red asserts itself. The mines at Apt have been worked for years, and are unlikely to be exhausted for a long time.

THE CRIPPLE CREEK DISTRICT, COLORADO.—II. MILLS AND SAMPLERS.

Written for the Engineering and Mining Journal by S. F. Hazlehurst.

A considerable portion of the Cripple Creek ores are handled by the samplers, of which there are 5 in active operation in the district, while another one will be ready for work about the first of the year. The samplers offer great advantages to the miners, as they can have their ores sampled in bulk on the spot, under their own supervision, while the samplers stand ready to purchase them. As the character of the ores in the district makes it a matter of economy to sample and assay continually, a great saving of both time and expense is the result.

The process employed in the samplers is pretty much the same in all, with some minor differences in the machinery used and in the manner of mixing the ores so as to secure the most satisfactory results. For the benefit of those who may not be familiar with the terms generally used in this business it may be well to state that the terms coning and quartering refer to the ore as it is piled up in a cone-shaped heap on the metallic floor, where it is gradually worked around with a spade till it is spread over quite a large surface, when it is divided into quarters by a mark, and the alternate sections are put back in bins, while the other quarters are mixed, spread out and quartered over and over again until the bulk is reduced to the requisite amount, which is sent to the sample room for further grinding and reducing for the use of the assayer. The sampler of the National Gold Extrac-

tion Company is situated on the east side of the district, adjoining the town of Goldfield. There are 2 buildings, the main building and the office, the latter containing a well-appointed assay office. The capacity of this sampler is about 200 tons a day, and it is connected with the Florence & Cripple Creek Railroad by an admirable system of tracks which gives every possible facility for handling the ores. An Atlas engine, made in Indianapolis, was formerly used for power, but this has been replaced by a 30-H.-P. motor furnished by La Bella Power Company. The ore is first passed through a Blake crusher 9 by 15 in., then through a set of rolls 14 by 24 in., dropped through a ¼-in. mesh and passed into a Vezin cut-out, which reduces it to 1/25 of its bulk. It is then spread out on the floor, where it is coned and quartered, finally passing through an Engelbach grinder for the final preparation of the pulp and having all the moisture expelled by drying over steam pipes, it is soon ready for the hands of the assayer. Four samples are made, one for the shipper, one for the sampler, one held in the office in case an umpire should be necessary, while the fourth is sent to the National Mill at Florence, where it is assayed for sulphur. Two shifts of 14 men each are working at present.

The Eagle Ore Sampling Company has a fine building near Goldfield; it is 100 ft. high and 100 ft. square, covered with corrugated iron, and fitted up in a very convenient manner. About 450 tons of ore can be treated each day and 14 men are employed by the company. The trackage system, which gives connection with both the Midland Terminal and the Florence & Cripple Creek railroads, is owned by the sampler; it is 3,400 ft. in length and is arranged on the gravity system, so that the cars can be placed in position for unloading, loading and weighing simply by the use of the brakes; the loading being done by means of chutes directly into the cars. The Colorado Electric Power Company, of Canon City, furnishes a 75-H.-P. motor for the



ECONOMIC GOLD EXTRACTION COMPANY'S MILL, CRIPPLE CREEK, COLO.

operation of this plant. The ore is first passed through a Blake crusher 10 by 20 in., made by the F. M. Davis Iron Works Company, of Denver; then it goes through a set of Davis rolls 16 by 36 in., with a feeder of the same name; then through the Davis finishing rolls, 12 by 12 in. Afterward it is reduced by the Vezin cut-out and the usual coning and quartering processes to 1/50 of its bulk. The pulps are dried by a return system of 1-in. steam pipes which are set up in brickwork 6 ft. high, 4½ ft. wide by 2 ft. in depth, giving room enough for 56 sample pans, each one having a separate floor; to furnish the steam for this dryer it has been found economical to use an Ideal boiler with from 3 to 5 lbs. pressure. Davis grinders are used for the last part of the work. Five samples are made, one for the shipper, one for the sampler, one for a possible umpire, while the others are held in case of necessity. This sampler is fitted throughout with friction-clutch pulleys, which allow the heavy machinery to be thrown off, thus economizing the power. Fourteen men are employed.

The Taylor & Brunton sampler is situated on the hill above the city of Victor, where they have a very complete set of buildings, comprising the main building, general office, with assay office attached, superintendent's house, two other houses for the officers and clerks, and a brick building which contains a blacksmith and carpenter shop and a well-planned lavatory, fitted up with clothing lockers and hot and cold water for the use of the employees. The plant is operated by a 75-H.-P. motor furnished by the Colorado Electric Power Company, of Canon City. The capacity of the works is about 600 tons a day, while there are 35 men employed by the company; the business done

in the year 1899 amounted to \$5,044,000. Ample trackage is furnished by both the Midland Terminal and the Florence & Cripple Creek railroads. First of all, the ore goes through a Blake crusher 10 by 20 in., afterward through 3 Davis rolls 36 by 16 in., 27 by 14 in., and 20 by 12 in. The pulp is mixed entirely by mechanical means, no coning or quartering being used. It is dried by means of the Taylor & Brunton desiccator, which was made by the Dillon Iron Works, of Denver. It consists of a series of cast-iron columns with steam pipes in between, giving room for 28 drying pans, each one with its separate door.

The Rio Grande Sampling Company has its plant in the city of Victor, where it has excellent trackage facilities with all the railroads. In this sampler the ore is first passed through a Blake crusher 10 by 20 in., thence it goes through 16 by 36-in. rolls, and is reduced to 1/5 by a Vezin cut-out. It then passes through 14 by 27-in. rolls, is cut down 1/5 more, and put through a third set of rolls; being afterward coned and quartered in the usual way, the usual four samples being made. The capacity of the plant is 400 tons a day, and the business done in 1899 amounted to \$3,500,000. The power for this sampler is furnished by La Bella Company, at Goldfield, in the shape of a 60-H.-P. motor. The ore is shoveled direct from the cars into the crusher, but all the loading is done automatically through chutes.

The Cripple Creek Sampling and Ore Company has its plant on the outskirts of the city of Cripple Creek and occupies a building which is 50 by 160 ft., with an office across the road. The tracks of the Midland Terminal Railroad give abundant facilities for handling the ores. There are two separate motors, which are furnished with power by La Bella Company, of Goldfield, each of 35 H. P. The Blake crushers, 9 by 15 in., are used by both plants; in one set 3 of the Davis rolls, 16 by 36 in., 12 by 20 in., and 10 by 16 in., are used; in the other the same kind

of the same kind.

of rolls are 20 by 10 in., 16 by 36 in., and 12 by 16 in. Vezin cut-outs are used, and the final grinding is done in the Engelbach grinder. The daily capacity of the works is 600 tons, while they have storage room for 2,000 tons. There are 25 men employed.

From the samplers we may now pass to the mills and reduction works. The mill of the Colorado Ore Reduction Company is situated south of Elkton, a few hundred yards below the line of the Florence & Cripple Creek Railroad. The main building covers about 1½ acres of ground, while in addition there is an office and assay building and what is known as the Arequa Club, where the officers and clerical force have a "mess." The sampling department has a capacity of 240 tons a day. Here the ore is passed through a Blake crusher 9 by 15 in., and then through Davis rolls 14 by 27 in., whence it goes into a Vezin cut-out till it is reduced to 200 lbs., when it is put through another set of Davis rolls 12 by 12 in., and crushed to a No. 6 mesh, then cut to 12 lbs. by hand, dried in an Engelbach drier, and the pulp put into four samples.

In the crushing department the ore is crushed to ½-in. mesh, dried in a cylindrical drier built by the F. M. Davis Iron Works Company, of Denver, after the White-Howell pattern, and from that it is carried by a belt to a system of fine crushing rolls consisting of three sets of Davis rolls 14 by 27 in., with 6 sets of revolving screens, which reduce the pulp to a 24 mesh. These screens are provided with a knocker of a new design, which gives an increased capacity approximating 25 per cent. and lengthens the life of the screen cloth about 100 per cent. The rolls are provided with devices whereby the roll shells are kept true without any trimming whatever, thus getting the full wear out of all the material in the shell. From the rolls the ore is carried by a screw conveyor into bins, from which it is trammed by hand to a Ropp roaster and thence by a chain conveyer provided with a water jacketed trough to storage bins. From these bins the roasted ore is trammed to the two different processes which are in use in this mill, as the characters of the ores may require, and I will first take up and describe the cyanide process as it is employed here.

In the leaching room there are 4 tanks of 50 tons capacity each, 2 of 65 tons each, and 2 of 150 tons each, giving a capacity of 630 tons. Here the pulps are allowed to remain in the cyanide solution until the gold has been dissolved, the time required for this varying according to the character of the ores. The solution is drawn from the tanks through a filter bottom which is fixed in each tank, and the gold in solution is washed out of the pulp by the use of water; after which the tailings are sluiced over a system of riffles, thereby effecting another extraction from the tailings. Then all the solution is passed through boxes which contain zinc shavings, the contact of the gold bearing solution and the zinc causing a precipitation of gold in the form of a double cyanide of zinc and gold; this precipitate is known as zinc slimes and they are treated by sulphuric acid converting the zinc into the zinc sulphate which is washed out by hot water, while the residue is melted in an ordinary wind furnace and cast into gold bars. The solution, after the precipitation has taken place, is standardized by the addition of more cyanide and used as before.

The chlorination process as it is applied here may be described as follows: In the barrel room there are 3 barrels, 2 holding 10 tons each and one 5 tons; they are lined with sheet lead and provided with filter bottoms of hardwood and lead; into them is poured the roasted pulp together with certain quantities of bleaching powder, sulphuric acid and water. A cover is screwed over the charging hole and the barrel started revolving on its trunnions. Chlorine gas is produced by the action of the chemicals employed and it immediately attacks the gold, and this in the presence of water forms the tri-chloride of gold. This solution is drawn off from the barrel, sufficient water being added to wash the pulp, and then it is allowed to settle for several hours in a lead-lined tank, whence it is pumped into other tanks, in which the gold is precipitated by the passage of hydrogen sulphide gas. This precipitate is the sulphide of gold and it is allowed to settle until the barren solution is practically clear; then the tank is tapped about 4 in. above the bottom and a clear solution is drawn off and passed through a filter press so that any gold slimes that may be in suspension can be saved. These gold sulphides are washed into the filter press, worked by compressed air, then taken out and roasted in a muffle furnace until they are free from sulphur. Afterward they are melted in a wind furnace and cast into gold bars. Both steam and electricity are used for power purposes in this mill. The former is furnished by a 60-H. P. engine, while the Colorado Electric Power Company of Canon City has in place two Westinghouse three-phase motors, one of 100 H. P. and the other of 40 H. P. Oil is in use for fuel in the roasting furnaces. In all, 46 men are employed in the works.

The Economic Gold Extraction Company's mill, which is the largest in the district, has only been completed and put in operation during the present year. It is built alongside of the Florence & Cripple Creek Railroad, on the west side of Squaw Mountain, about half way between Elkton and Victor. Most of the ore used in this mill is brought from the Gold Coin Mine in Victor by means of a tunnel ¾ mile long, through Squaw Mountain. This will soon be furnished with electric power for the more rapid handling of the cars.

In handling the ore it is first of all carried from the receiving bins into the mill by flat belt conveyers and put through a No. 5 McCully crusher; then the bulk of it passes over grizzlies, while that part which is over-size goes through a series of fine crushers, 4 by 24 in., built by the Colorado Iron Works Company, of Denver. It is then taken up by an elevator to the automatic samplers built by the Denver Engineering Works Company. These are furnished with the usual regrinding machinery, composed of one Davis roll and one roll made by the Denver Engineering Works Company. These bring it to the sampler, and after it has been sampled the ore is carried by a belt conveyor to a series of dry bins, which are built of brick and angle iron, and heated by the waste steam from the roasters, thus utilizing heat which is generally allowed to be lost. To carry the ore into the mill proper it is drawn out by a conveyer to the 5-ton hoppers which are placed about each roll; of these rolls there are 6, each 16 by 36 in., man-

ufactured by the Denver Engineering Works, their daily capacity being 300 tons. Then the ore is passed over inclined screens to the storage bins, the product being from 16 to a 20 mesh; from the bins it is trammed to the roasters, of which there are 7, of the Argall type. From them it passes to the economic ore cooler, which is peculiar to this mill, and may be briefly described as follows: It is a shell 18 ft. in length by 6 ft. in diameter, a continuous channel 360 ft. long being made inside by pieces 2 by 4 in., riveted to the shell, 12 in. apart. It is raised at the far end, where it is furnished with discharge spouts; the cylinder revolves under water, which is constantly cooled by a sprayer, and the temperature is reduced from 1,600° Fahrenheit to 150° or 200°. The capacity of the cooler is about 60 tons in 24 hours.

Leaving the cooler, the ore is elevated to the storage bins above the barrels, where it is trammed to the barrels in two sets of Fairbanks & Morse hopper scales. There are 7 chlorination barrels, each 7 by 17 ft., with a capacity of 20 tons, built by the F. M. Davis Iron Works, of Denver. They are charged from above by spouts leading down from lead-lined cars, which carry the usual charging materials, sulphuric acid, chloride of lime and water. After remaining in the revolving barrels for 4 hours the solution is drawn off into the ordinary lead-lined tanks and sulphuretted hydrogen is injected. All the sulphuretted hydrogen required is made in the mill, the scrap wrought iron being melted in a cupola and the gas prepared at a trifling expense.

After the solution has remained in the tanks for the necessary time it is collected in filter presses made by the Stilwell-Bierce & Smith-Vaile Company, and thence the products go through the final refining process. The tailings from the mill, as taken from the barrels, are run over Wilfley tables, of which there are 10 double-deck and 2 finishing tables.

The capacity of the mill is 300 tons a day. Power is furnished by La Bella Works, at Goldfield, and the Colorado Electric Power Company, of Canon City, to the amount of 300 H. P., divided up between 13 motors, ranging from 3 to 100 H. P. In all 55 men are employed in the mill.

The second illustration is a view of the new plant of the Union Gold Extraction Company at Florence, which is now nearly completed. This chlorination plant was designed by Mr. John E. Rothwell; work was begun in February last, and the mill is now nearly ready to start.

#### STAMP MILL TAILINGS AS A STREAM PURIFIER.

The city of Deadwood, S. D., became fearful that the new sewer system of Lead City would be a source of danger, and began an investigation of the matter. Omitting the question of pollution of the water supply from the report of Charles Carroll Brown, the engineer making the inspection, the peculiar effect of a heavy load of fine sand, tailings from stamp mills, in preventing nuisance in the stream, is stated as follows:

1. It is my opinion that if anything approaching a flow of 300,000 gals. of sewage from the City of Lead were discharged into Gold Run at the point proposed for the outlet, under the original conditions in that stream, a nuisance would be produced which would affect the city of Deadwood injuriously, both by reason of the objectionable odors and by reason of its effect upon the health of the citizens of Deadwood. This statement is not of much value at the present time, but it should be recorded, that it may not be lost sight of. The exact amount of dilution of the sewage by the water of the stream is not now determinable, but it is probably not more than 1 part of sewage to say, 5 or 6 of water. Observation of streams under similar conditions fully warrants the first statement in this paragraph.

2. Were the amount of water increased to the amount now flowing in the creek, the dilution would be largely increased, and would in that case be 1 part of sewage to 20 parts of water. This would materially diminish the effect of the sewage upon the water, and would therefore reduce the causes for complaint from Deadwood.

3. Were the amount of water increased to that proposed with the new supply added, a still further purification will be effected. It is my opinion that the amount of pollution under such conditions would still be appreciable at Deadwood, and possibly sufficient to affect objectionably the health of its inhabitants.

4. If now we add to the water as described in sections 2 and 3 the 2,400 tons of tailings which, it is reported, are now discharged into the stream, a very material increase in the dilution of the sewage is effected, which, under the conditions in the stream at the present time, is of a nature to aid in the separation of the sewage into invisible and inappreciable particles and to cause its decomposition and return to its original elements to be so distributed as to be without effect upon the stream for its present uses or upon the citizens of Deadwood. These various conditions are thus separated and considered individually, because, while some are not probable, it is possible that any of them may exist for an appreciable length of time, and the probable conditions under any of the cases should be borne in mind.

5. There is one set of conditions which requires special attention, and concerning which there is not now sufficient information obtainable on which to base an opinion. It is stated that in winter some portions of the stream fill up with frozen sediment and ice in which the floating material of all kinds is caught, and in which sewage would likewise be retained. Whether enough would thus be held back and it would become concentrated enough to cause a nuisance during any part of the year, is a question which can only be answered after some experience. In general it may be said that some trouble is possible in the spring before the winter's deposits are all removed. How much cannot be predicted.

**BILLITON TIN.**—The production of tin in the Billiton District in Java for the year ending June 30th, 1900, was 10,767,261 lbs., against 12,224,296 lbs. in 1899, and 11,680,592 lbs. in 1898. The largest output ever reported from the district was 14,130,585 lbs. in 1891-92; since that time the production has been gradually decreasing.

## A BRIDGE FOR CARRYING MOLTEN IRON.\*

In a short time the Carnegie Steel Company will be using molten iron from the Carrie furnaces at the Homestead Steel Works, situated diagonally across the Monongahela River from the blast furnaces. The bridge is being built at Rankin station, a few miles up the Monongahela River from Pittsburg. The purpose of its erection is primarily to utilize the molten iron from the Carrie furnaces at the Homestead mills and secondarily to give the Union Railroad, one of the Carnegie interests, a right of way to the Carrie furnaces. Ore and other material used at these furnaces now comes by way of the Baltimore & Ohio and Pennsylvania railroads. From an engineering standpoint the bridge is noteworthy.

At the present time the hot metal that is used at the Homestead Steel Works is brought from the furnaces at Duquesne, a distance of nearly  $4\frac{1}{2}$  miles. The new route from the Carrie furnaces to Homestead is less than 1 mile in length. Furthermore, since the steel producing capacity of Duquesne is being largely increased it will soon require all the metal produced at the adjoining furnaces. In addition, the molten iron in transit from the Duquesne furnaces loses much of its initial heat. And this is not at all surprising since from the time the iron is tapped from the furnaces until it reaches the mixers nearly an hour elapses. It is estimated that the time from the furnaces at Rankin to Homestead will be at the most 20 minutes. While no trouble has been experienced from the loss of initial heat under the present arrangement, the shorter route will mean a saving in fuel at the steel works.

The main span of the bridge is 500 ft. in length and will weigh, approximately, 2,500 tons. For its length this span is one of the heaviest in the world, for a two-track bridge. The shorter span, which is already in place, is 252 ft. in length and its weight is in proportion to that of the longer span. When completed the bridge will weigh approximately

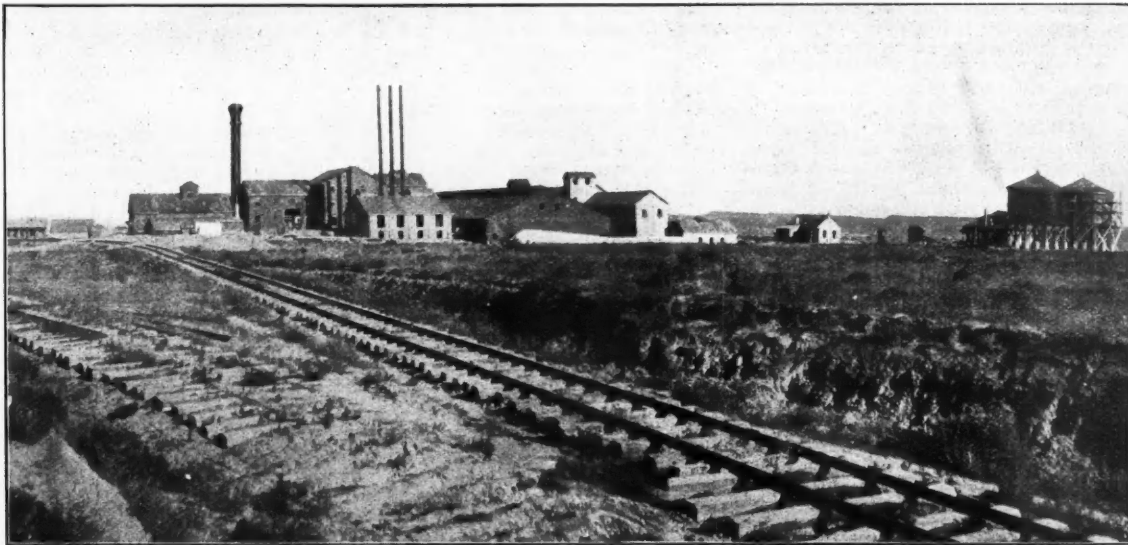
tion. It is only a few months since the piers were completed and the trestle work commenced. The erection of this bridge adds another hot metal route to the other two now extending across the Monongahela River. The Port Perry Bridge has been doing service for the Carnegie Steel Company for several years and is now in use, and Jones & Laughlins, Limited, are completing a hot metal bridge across the Monongahela River from Eliza Furnace on Second Avenue in Pittsburg to the company's South Side steel works. The Rankin hot metal bridge was designed by W. H. Smith, chief engineer for the Union Railroad.

## MICHIGAN COAL MINES IN 1900.

Under the Michigan inspection law of 1899 the commissioner of labor was given authority to collect certain statistics, relating to labor, wages, products, coal, etc., which had never before been gathered, and which are presented in a bulletin just issued, which covers the 9 months ending September 30th last.

For these 9 months 26 coal mines have been in operation in Michigan. These mines are principally located in the Saginaw Valley, although Shiawassee County has 2, Jackson County 1, and there are 5 small drift mines near Grand Ledge, in Eaton County, these latter being operated by only a few employees, using no powder and but little oil, the owners generally working with the men in taking out coal. These 5 mines have averaged about 540 tons per month.

The monthly reports from the managers of the mines show an aggregate of 1,600 employees at work, an average of 62 for each mine, although 3 of the mines have over 150 employees all the time, several others approximating 90 employees each. A large per cent. of the miners are paid by the ton for their work, their working days averaging only about 7 hours each. Of course surface men and certain other employees



MILL OF UNION GOLD EXTRACTION COMPANY AT FLORENCE, COLO.

9,000 tons. The total length is 2,300 ft. and in addition to the two tracks there is a sidewalk. One track will be for hot metal trains exclusively, and the other for taking ore, limestone, etc., to the Carrie furnaces and for the transportation of slag from the furnaces. The hot metal tracks will be entirely inclosed in steel below and on the sides. The purpose of this is to protect passing vessels from the hot metal in case it should splash. In addition it is a protection to the steel entering into the construction of the bridge. With hot slag from the furnaces the same precautions do not have to be taken, as it does not retain its initial heat like the molten iron, and should it fall from the ladles it will not be hot enough to damage passing steamers or to injure any of the steel parts of the bridge.

The ties carrying the hot metal track will be of wood and will be well protected from the molten metal. The tracks will be guard-railed and on either side will be inclosed by steel plates,  $\frac{3}{8}$  in. in thickness and reaching to a height of 4 ft. For a distance of 6 ft. above this there will be plates  $\frac{1}{2}$  in. in thickness. The heavier plates will be clamped to the tracks and in addition will have a fire-brick covering. Sand will be filled in between the ties and will be spread over them.

The bridge contains some of the heaviest pieces of structural material ever put in a similar structure. There are eight girders and they range in weight from 59 to 70 tons. The patten posts of the main girder are 48 in. in width. The channel span will be a trifle over 81 ft. between centers of bottom and top chords, the bottom chords being composed entirely of steel bars 10 in. wide and ranging in thickness from  $1\frac{3}{8}$  to  $2\frac{5}{16}$  in. The top chord will be 48 in. wide and 36 in. high, having four web plates extending the entire length of the span. These chords are in sections of 53 ft., weighing from 36 to 38 tons each. The end posts will be 78 ft. long and will weigh about 52 tons each. Adjoining the big span are two deck spans, 122 ft. 3 in. long, made of plate girders, weighing from 51 to 70 tons each. At the Homestead terminus there is a Y, the tracks leading to Duquesne and Homestead steel works respectively.

The bridge is being built by the Keystone Bridge Works of the American Bridge Company, and rapid work has been done in its erec-

average more than this, but in no case do they exceed 10 hours per day. While 26 days is recognized as a month's work at most kinds of employment, the miners, for certain reasons acceptable to operators and employees, only average about 20 days each month, work under ground being of such a nature as to preclude constant employment.

The aggregate daily wages paid to the employees is \$3,724, or an average of \$2.33 paid each employee per day. The average daily wage of many of the larger mines is over \$2.50. It is noticeable that in some of the mines in the heart of the mining district the wages approximate \$2.90 per day.

All the mines use more or less illuminating oil, those before mentioned at Grand Ledge using but a small amount. The monthly consumption of oil for the 26 mines, for the first 9 months of the year, aggregated 13,898 gallons, or 1,544 gallons for each month, being about 60 gallons for each mine.

Powder for blasting purposes is used in 20 of these mines, the aggregate for the 9 months being 27,909 kegs of 25 lbs. each, an average for each month of over 3,000 kegs, or an average of 155 kegs monthly for each mine using powder. It is probable that there will be over 1,000,000 lbs. of powder used in the coal mines of Michigan during the current year.

For the 9 months covered by this bulletin there was mined in Michigan 613,408 tons of coal, an average of 68,156 tons for each month, or an average for each mine of 2,621 tons monthly—this means for all mines, both large and small. There are a few mines in the Saginaw District that approximated 7,000 tons monthly.

The total cost of the entire output of these 26 mines for the 9 months was \$838,937, or a monthly average of \$93,215. The monthly average for each mine is \$3,547. Several of the larger mines are paying out over \$12,000 monthly. The average cost per ton for the entire 26 mines is about \$1.40, although it has cost some mines as high as \$2 per ton to take out the coal.

Within the past month 8 new mines have been put in operation and are now taking out coal, and it is probable that the coming year will see 40 mines in operation. The output for the 3 remaining months of the year will exceed that of any previous 3 months of the year. Some of the new mines will be operated on an extensive scale.

\*Abstract of article in the Cleveland "Iron Trade Review."

## THE ANALYSIS OF URANIUM AND VANADIUM ORES.

Written for the Engineering and Mining Journal by Oliver P. Fritchle.

This scheme for the determination of uranium and vanadium is particularly adapted to the mineral carnotite, which is principally a hydrous potassium uranium vanadate. Both uranium and vanadium can be reduced to their lower oxides in a sulphuric-acid solution, with metallic aluminum, and then again oxidized to their higher oxides with a solution of potassium permanganate.

Weigh into a 6-oz. flask  $\frac{1}{2}$  gramme of the finely powdered ore, moisten with a few drops of water, add 10 c. c. of nitric acid, and digest at a slow boiling temperature for about one hour. Remove from the source of heat, dilute with 10 c. c. of water, add gradually to neutralization a saturated solution of  $\text{Na}_2\text{CO}_3$ , and then 5 c. c. excess; then add 20 c. c. of a 20 per cent. solution of NaOH. Boil slowly for about half an hour, and then allow the precipitate to settle until the supernatant liquid is clear.

The uranium, vanadium and iron are all precipitated by the sodium carbonate, but on adding a moderate excess of sodium carbonate and a large excess of NaOH, the vanadium is dissolved, while the uranium and iron remain insoluble. Uranium is easily precipitated by sodium carbonate and sodium hydrate in the presence of an iron salt.

Filter off the precipitates of iron and uranium and wash a few times with a solution of NaOH. Do not wash with water, as it washes the uranium precipitate through the filter. The filtrate should show no uranium on testing a nitric-acid solution with potassium ferrocyanide. The filtrate contains all of the vanadium and it could be determined from this solution were it not for the fact that so large a volume of salt solution is difficult to evaporate and displace with sulphuric acid without violent bumping and considerable loss by spattering. Furthermore,  $\text{V}_2\text{O}_5$  is not easily soluble in nitric acid, and only by long digestion is all of the vanadium obtained in solution. Therefore it is more expedient to determine the vanadium in a separate sample as given below.

Dissolve the precipitates on the filter with 20 c. c. of hot dilute nitric acid (1:1), letting the solution run into the original flask. Dilute the solution with about 40 c. c. of water, add  $\text{NH}_4\text{OH}$  until a slight permanent precipitate forms; then add 40 c. c. of a saturated solution of ammonium carbonate ( $\text{NH}_4)_2\text{CO}_3$ , freshly prepared and heated slightly to remove any excess of  $\text{CO}_2$ . Uranium is easily soluble in an excess of ammonium carbonate, and the iron is insoluble. Heat to boiling a few minutes, but do not boil, as the ammonium carbonate will be decomposed and the uranium precipitated by the ammonia. Filter off the iron precipitate and wash well with a 2 per cent. solution of ammonium carbonate. The filtrate contains all of the uranium and should not show a trace of vanadium by testing with hydrogen peroxide in a nitric-acid solution. A red coloration shows the presence of vanadium. Add slowly 20 c. c. of dilute sulphuric acid (1:1), and boil until dense white fumes are given off. Cool, dilute to about 100 c. c., add about 4 sq. in. of sheet aluminum, cut into half a dozen strips, and boil for half an hour or until the yellow solution is reduced to a sea-green color. Fill the flask with water, decant into a No. 4 beaker and titrate the uranous solution, hot, with a standard solution of potassium permanganate. The iron equivalent of the permanganate, multiplied by 120/56, will give the amount of uranium in the  $\frac{1}{2}$ -gramme sample.

Dissolve the iron precipitate with hot dilute HCl, add 10 c. c. sulphuric acid, boil to white fumes, cool, dilute, reduce with metallic aluminum, dilute, decant into a beaker and titrate with the standard solution of potassium permanganate.

The vanadium is determined in a separate sample as follows: Weigh into a 6-oz. flask  $\frac{1}{2}$ -gramme of the ore, add a few drops of water, 10 c. c. nitric acid and 10 c. c. sulphuric acid. Boil until the nitric acid is all expelled and dense white fumes of sulphuric acid are evolved. Cool, dilute, add aluminum, and reduce the uranium, vanadium and iron by boiling for half an hour. Fill the flask with water, decant into a beaker and titrate, hot, with the standard solution of potassium permanganate. The number of c. c. of permanganate, less the number of c. c. required for the uranium and iron, is the permanganate required to oxidize the vanadium, which, multiplied by 51.1/112, gives the amount of vanadium in the  $\frac{1}{2}$ -gramme sample.

The end reaction of vanadium is slow, and permanganate must be added slowly until a permanent pink is obtained.

I prefer the use of aluminum to either zinc or sulphurous acid as a reductor. In the case of vanadium, if sulphurous acid is used, the vanadium is not reduced as low as when aluminum is used, being reduced only to the blue color, and requiring, approximately, half the amount of potassium permanganate.

The volumetric estimation of vanadium by potassium permanganate is a beautiful titration, changing from purple through blue, green and yellow to pink.

## SOME NOTES ON ALASKA.

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

The following are some observations made on my recent trip to Alaska. Though I spent most of my time in the Ketchikan District, I extended my trip as far as Bennett Lake. Contrary to the general opinion entertained of Alaska, this district has a fine, healthful climate, mild all winter, the cold rarely reaching  $14^\circ$  above zero. The ice on the lakes forms not over 10 in. thick, furnishing a supply for summer use, while the snow-fall is moderate except on the high mountains, and owing to the warm rains, does not lie long on the ground. Over all this part of the west coast the rain-fall is heavy at the change of seasons. Timber and all vegetation grow in great luxuriance. Anything can be raised where land flat enough for cultivation can be found. The mountains rise abruptly from the shores of the canals and water-courses, to a height of several thousand feet, and are heavily wooded to an altitude of about 2,000 ft. The mountains rising so abruptly, there is a fine opportunity afforded to test the veins by deep tunnels, which give backs as high as the length of the tunnel. There is ample

timber and wood for all purposes. Bear, deer and small game abound, while the finest fish of both salt and fresh water can be had in abundance. The frequent communication with Seattle by regular lines of boats makes supplies cheap, so that this district has most favorable local facilities for the development of its many and promising veins.

The geological formation is said to be the Jura-Trias, similar to the Mother Lode of California, to which it bears a strong resemblance in all its features. By the Mother Lode I do not mean merely the Mother Lode proper, but also the Sheep Ranch Belt and the Upper or West Point Belt. We have in this district the Anhydrous Mica Schist Belt, said to rest against the granite and upon this the Talcose and Chloritic Schist Belt carrying with it a belt of marble similar to that found east of mother lode, while dikes of greenstone, diabase in places, more or less sheared by great pressure, cross the country and accompany the veins, at places becoming a beautiful green porphyry with white feldspar crystals resembling the Verde Antique porphyry of the Roman ruins. Dark diorite or gabbro dikes are also found, and some of the former resemble the Lake Superior dikes.

A partial analysis of the schists at Helm Bay gives as follows: Loss on ignition, 2.45; loss in acetic acid, 8.31; loss hydrochloric acid, 13.53; iron pyrites, 0.60. While an approximate analysis gives as follows: Silica, 30.7; ferric oxide, 36.5; alumina (?), 3.0; magnesia, 6.6; lime as carbonate, 7.1; iron pyrites, 0.6; alkalis and undetermined, 15.5; total, 100 per cent.

The main bodies of quartz are in several parallel sheets which clear-cut the bedding planes of the schists and dip  $55^\circ$  to  $65^\circ$  north and  $20^\circ$  to  $40^\circ$  to the west, while the bedding-planes of the schists dip  $65^\circ$  to  $75^\circ$  to the east on the east side of the mountains, though the general dip of the country seems to be to the west. There are also bedded quartz seams and seams vertical to the other main quartz seams. One description will not cover all the conditions under which the gold is found, but in several of the mines I examined the so-called vertical veins appeared to be the mineral producers, as the great sheets seemed to be nearly barren on the surface, except where cut by these verticals, which dip to the west at an angle of  $65^\circ$  to  $75^\circ$ . However, when conditions allow a deposit of gold ore near the surface, native gold, tellurides and auriferous pyrites are found in the so-called barren quartz, but in most cases the native gold is found only on the junction of the quartz with the schists, segregated out as though a gold-bearing solution had permeated the entire formation. In specimens said to have been taken at Helm Bay, I recognized tetrahedrite in connection with the native gold. So far as my observation goes, the minerals are found only near places of great geological disturbance, forming the so-called vertical veins. These are secondary fillings carrying rich sulphurets and free gold in paying quantity, and run from a few inches to several feet in width, increasing in width where they cross the horizontal seams. In all the crevices the quartz occurs in lenses tapering in all directions and following each other in succession. The sulphurets in these veins assay from a few dollars up to \$500.

On Prince Edward's Island there is a large belt of marble cut by quartz ledges which carry high values in gold, the gold occurring in little brown streaks in the quartz. They do not show their value to the eye, though running, in some cases, extremely high.

At Helm Bay, the Alaska Gold Standard Mining Company has erected a 5-stamp mill, which it is about to increase to 10. With an arrastra, from a few tons of ore, they produced \$20,000. Owing to want of development on the property, the operation of the mill is intermittent. The ore, as worked in the mill, runs from \$3 to \$12, with an average assay of \$4.33. It contains in free gold 48.24 per cent. and in the sulphurets 51.76 per cent. This is an extremely good showing, considering the amount of waste rock worked to keep the mill running. The company is extending the openings in the mine and find an excellent quality of ore.

In this neighborhood there are several other properties on which a little development work is being done and the ore shipped to Tacoma for treatment or worked on the ground with arrastras. Probably the greatest development is being done on Prince Edward's Island, where there are a great many companies beginning development work, especially in the neighborhood of Port Johnson. On this island there are a great many promising veins carrying copper and gold, and the local facilities for working them are good; in fact, all through this country there is plenty of water power for the driving of mills, in most cases at very little expense of installation of a plant, as the mountains rise so abruptly, enclosing lakes at high altitudes, whose overflow, in many cases, furnishes ample water power for large mills.

Several companies are preparing to build mills next season and there are quite a number of good properties seeking capital for equipment.

**ZINC PRODUCTION IN RUSSIA.**—The production of zinc in Russia has hitherto been confined to Poland, where this industry has existed since the year 1816. The Poland zinc industry is at present in a very fair state of development, the total for 1898 being 5,500 tons, against 3,900 tons in 1875, and 410 tons in the year 1816. The total production of zinc in Poland, since this industry commenced, amounts to an aggregate of 240,000 tons.

**LIME MAKING IN INDIA.**—According to "Indian Engineering," no minerals of any value are found in Sylhet, but the business of limestone burning for the manufacture of lime, with stone brought from the Khasi Hills quarries, is one of the most important industries in the district. It is confined to the Sunamganj sub-division. The practice of conveying the limestone to Eastern Bengal and Calcutta by steamer is on the increase, and threatens to injure seriously the local trade at Chatak. The lime weighs heavier than the stone from which it has been produced, so that there is an actual economy in carriage in transporting the limestone to its destination unburnt. The fuel used for the burning process is the reed jungle, which grows in such inexhaustible profusion in the low lands along the north of the district. This is cut and floated down the rivers for use, forming a cheap and excellent fuel for its special purpose.



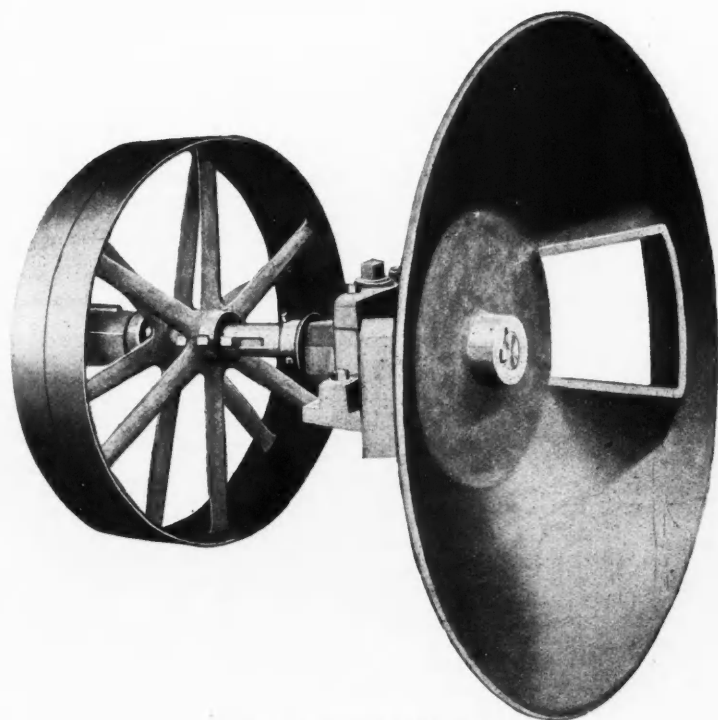
## THE SNYDER ORE SAMPLER.

The accompanying illustration shows the Snyder automatic ore sampler, which consists of a large casting shaped somewhat like a miner's gold pan, with an opening on one side, the whole mounted and revolving on the end of a horizontal shaft provided with tight and loose pulleys. The ore to be sampled is allowed to fall on the inside of the sloping flange and slides off into a receiving bin. As the sampler revolves, the opening in the flange passes under the spout and allows a portion of the ore stream to pass through to the back of the sampler into a second bin, where it forms a sample of the lot. The Snyder automatic ore sampler, while making but one cut on the material, accomplishes the same work as other machines making three, owing to its construction. It is made by the Gates Iron Works, of Chicago.

## A SLATE PAVILION AT PARIS.

The accompanying illustration shows a handsome pavilion erected in the grounds of the Paris Exposition by the Societe de la Commission des Ardoisieres d'Angers, for the exhibition of its products. These included roofing slate, slabs, fastenings for slate roofs and other accessories of the business. A large number of drawings and photographs were shown in the building to illustrate the machinery and methods used in working the slates. There was also a historical series of drawings illustrating the gradual evolution of these methods. The series began with the operations in open pit or quarry, which were carried on in the sixteenth century. The methods of hoisting, etc., before the introduction of the steam engine were shown; the first engine and the machinery driven by it were illustrated also. Other drawings show the method of subterranean mining by benches, as planned by le Chatelier and adopted by the company in 1832; and the present system, adopted in 1863.

The company shows in another series of drawings the improvements



SNYDER AUTOMATIC ORE SAMPLER.

made in tools, notably in the applications of electricity. Electric lights were introduced in 1879, and in 1883 experiments were made with electric drills. These led later to the use of electric transmission for driving the pumps, hoists and drills.

Up to 1851 the company produced roofing slate only. In that year the late Charles Lariviere, then head of the firm, introduced machinery for making slabs, mantels and similar work. About the same time also the company established a shop for the manufacture of wire ropes, chiefly in order that any breaks in its cables could be quickly repaired.

Tests were made and shown at the Exposition to prove that the company's slate possessed the essential qualities of strength, elasticity and resistance to chemical action. Besides manufactured slate in different forms, a number of rough specimens, just as taken from the quarry, completed an exhibit which was probably the most complete of the kind ever made.

The accompanying engraving—from "Le Genie Civil"—shows the exterior of the pavilion.

**WIRELESS TELEGRAPHY.**—The British post-office authorities have just completed a series of experiments in wireless telegraphy across the British Channel between Ilfracombe and the Mumbles Lighthouse, a distance of 25 miles. At each place a pole was erected 100 ft. high. The object was to obtain working knowledge of the applicability of the system, especially to lightships. Ready communication was found possible, and signals were recorded on the tape instrument in the Morse code, even when the high wires were let down considerably below their full height.

## THE DEVELOPMENT OF THE ELECTRIC FURNACE.\*

By M. Keller.

The author takes as archetypes of all modern electric furnaces those of Siemens & Huntingdon and Moissan. The first of these consisted of a crucible of some refractory earth, receiving current at its base, a movable carbon pencil fixed within it acting as the second electrode. The arc was thus formed between the lower point of this carbon electrode and the surface of the materials contained within the crucible. The Moissan furnace consisted of a block of lime, hollowed out at its center to receive the materials to be heated, and provided with horizontal channels for reception of the two carbon pencils conveying the current. A second block of lime, fitting over the first, completed this furnace, and served to retain the heat emitted by the arc which formed between the points of the two carbon pencils when the electric current was passed along them. The materials in this furnace were placed in the hollow cavity in the center of the block and the arc played over their surface.

The first of the electric furnaces developed from the above laboratory types for industrial purposes was that of the brothers Cowles, of Cleveland, Ohio. In this furnace the material to be treated was placed between two conducting surfaces, which conveyed the current, and was surrounded by non-conducting finely-divided material. The current was thus obliged to traverse the material lying between the two electrodes, and if this in the unfused state was a non-conductor of electricity, movable carbon electrodes were used in order to form an arc above the furnace contents, and bring them to the fused condition. This furnace, invented in 1885, and improved in 1887, was used at Milton, in Staffordshire, for reduction of aluminum oxide, and for production of aluminum alloys.

The Héroult furnace introduced at a later date for obtaining alloys of aluminum with copper, was based upon the same principle as that



SLATE PAVILION AT PARIS.

of the Cowles brothers. This furnace has been used at Froges and at Neuhausen for production of aluminum, and more recently for the production of calcium carbide. The modified form adopted for the latter manufacture consists of a box mounted upon wheels, the base of which is of carbon, and the sides of some non-conducting material. The base of this box acts as one electrode, and a carbon rod, subject to a vertical up-and-down movement, forms the second. The furnace body is thus movable and can be wheeled away when the reaction is completed, in order to be replaced by a newly-charged one.

The author next classifies the furnaces designed for calcium carbide manufacture as: (1) Arc furnaces, based on the Moissan and Siemens type; (2) Resistance furnaces, based on the Héroult type; (3) Incandescence furnaces, based on the Cowles type.

Arc furnaces may be again sub-divided into three classes, according to the mobility of one or both electrodes and the number of carbons used. The furnaces designed by Patin, by the Deutsche Gold and Silberscheide Anstalt, and by Street, have both electrodes movable, and thus come under the first sub-division.

A very large number of furnaces fall into the second group, having one electrode fixed—generally as hearth or floor of the furnaces. The furnaces exhibited by the Societe des Carbures Metalliques at the Exposition, and those designed by Siemens & Halske, Schuckert and other well-known firms for carbide production, are of this type.

To the third sub-division belong all forms of the multiple arc fur-

\*Abstract of paper read before the International Congress of Electricity at Paris; from the London "Electrician."

nace, which has lately become much used, because it enables the area of arc heating to be greatly extended. The Gin & Leleux, Bertolus, Memmo, Nicolai and Bovy furnaces are examples of this type. In most of these furnaces the floor of the furnace acts as the common secondary electrode for the arcs which form between it and the three or more primary electrodes fixed around it. Polyphase currents are generally used with these furnaces.

In all arc furnaces the temperature attained varies with the intensity of the current used, but as in any case the temperature of the arc is very high and considerably above that required, loss of energy follows from arc heating in carbide production. There is also considerable loss of material, owing to the finer material charged being carried away by the "blowing" of the furnace. For these and other reasons arc furnaces are not suitable for carbide production.

Resistance furnaces resemble in form and construction arc furnaces, but they work with a lower E. M. F., as the materials charged into the furnace body act as intermediate conductors between the two terminal carbons. The work done can be calculated by aid of the Joule formula  $W = RI^2$ , and the temperature attained is directly related to the sectional area of the electrodes. In this type of furnace the fusion of the materials is tranquil, and is unaccompanied by violent evolutions of gas. For carbide production an E. M. F. of 20 volts to 25 volts suffices, but heavier currents are requisite than with the arc furnaces, and conductors of larger sectional area must therefore be provided. The new furnace of the Compagnie Electrometallurgique des Procedes Gin & Leleux is of this type, and is employed in a large number of carbide works.

In the third class of furnace—incandescence furnaces—the intermediate conductor between the ends of the two electrodes is formed by a succession of small pieces of coke or other form of carbon. The passage of the current causes this bed of coke to attain a high temperature, and the materials placed upon it or mixed with it in their turn are raised to the same temperature. This type of furnace permits the utilization within a limited area of the greatest amount of energy, and avoids the grave defect of the second type, namely, that the currents must always traverse the whole depth of the layer of materials already fused.

The author then passes on to consider electric furnaces under another classification, namely, that of the kind of current employed. Furnaces using continuous current have been sometimes called electrolytic furnaces, because in these not only thermal but chemical effects may be produced. Alternating-current furnaces have latterly been widely adopted, because the dynamos yielding monophase or polyphase currents are better adapted to stand the resistance variations incidental to electric furnace operations.

The furnaces employing mono-phase currents are best arranged in series, for in this case it is possible to utilize a higher E. M. F. and to save copper in the necessary leads. If, however, arc-heating is being employed, it is better to connect the furnaces in parallel.

Bertolus, in 1897, was one of the first to patent the application of poly-phase currents to furnace work. In the furnace designed by Bertolus tri-phase current was used, and three carbon electrodes were connected to the three terminals of the dynamo, while the hearth of the furnace itself provided the common return electrode. In later forms, the three different phases of the current have been utilized in separate furnaces, and these therefore each operate as though worked with mono-phase current.

The difficulty of obtaining carbon electrodes of suitable size and length has for a long time hindered the increase of the size of the furnaces. Engineers have, however, given much attention to this question, which for the carbide industry is of considerable economic importance. For those furnaces in which vertical electrodes are used, the carbon is generally formed square or rectangular in section, and undergoes special treatment in order to increase its conductivity, while for the other types of furnace carbons are usually made round. In order to protect the carbon at the point where it entered the furnace, it was at one time customary to use water for cooling purposes, but this proved dangerous, and it has been given up for cold air, or some form of protecting composition.

In the modern forms of furnace for carbide production, working with relatively low E. M. Fs., it is usual to find currents of 8,000 to 10,000 amperes employed. With such currents it is impossible to use ordinary cut-outs, and it is customary to make the movable electrode of the furnace act as circuit breaker. On account of the accidents which may occur to the dynamo, steam engine or turbine, when a single furnace is worked in this manner on an electric circuit, it is advisable to work several furnaces in parallel from the one dynamo.

The E. M. F. required in arc furnaces varies greatly, and depends upon the conductivity of the gases which are emitted from the heated substances. In the manufacture of carbide of calcium, an E. M. F. of 50 volts to 60 volts is required, in that of corundum 50 volts suffices, while the electro-thermal method for production of iron only requires 20 volts. In resistance furnaces, a lower E. M. F. is generally sufficient, and carbide of calcium can be manufactured in the Heroult type of furnace with a current of only 25 volts pressure. Aluminum can be produced in the same furnace with a pressure of from 20 volts to 25 volts. The third type of furnace—incandescence furnace—can work with practically any E. M. F. up to 80 volts or 100 volts, for the resistance increases with the increase of the length of the bed of materials through which the current has to pass, and this may be varied at will.

In the Cowles type of furnace currents of 5,000 amperes at 50 volts to 60 volts have been used. In the Heroult furnace currents of 6,000 amperes are used. For carbide production it is more customary to use currents of from 1,000 amperes to 2,500 amperes with single pairs of electrodes, but where several pairs of electrodes are used for arc heating in the same furnace, this current may be doubled, trebled or quadrupled. Furnaces with a single arc, and one movable electrode are, however, now being worked with currents of 5,000 to 6,000 amperes. The Gin & Leleux type of resistance furnace can be worked with currents up to 10,000 amperes, and the same amount of current can be utilized in the in-

candescence furnace, which, working with a higher E. M. F. than the resistance furnace is able to utilize for thermal purposes, no less than 1,000 kilowatts electrical energy.

Recent estimates have placed the total energy employed in electric furnace operations at 230,000 H. P., of which total, calcium carbide accounts for 185,000 H. P., aluminum for 27,000 H. P., copper for 11,000 H. P., and carborundum for 2,000 H. P. In France alone it is estimated that 60,000 H. P. are employed in the carbide manufacture; while the production of phosphorus, vanadium and ferro-chromium are more recent thermo-chemical industries.

The improvements made in electric furnaces in recent years have resulted in a greatly improved output of carbide per kilowatt hour, and in the latest form of the Gin & Leleux furnace it is now possible to obtain 6.20 kg. carbide per kilowatt day of 24 hours. This corresponds to a thermal efficiency of 75 per cent.

The paper closes with a few details concerning the electric furnaces which are exhibited in the electro-chemical section of the Exposition. Three of these are shown in operation, and comprise a Moissan furnace, a Bullier furnace, and a small model of the Gin & Leleux type of furnace. The first consumes 40 and the second and third 70 kilowatts electrical energy when in operation.

#### ELECTRICITY AT THE VICOIGNE-NOEUX COLLIERIES IN FRANCE.\*

In 1896 the Vicoigne-Noeux Company decided to add to its works 60 coke ovens of the Collin type. As these would yield a large quantity of waste gas, the company decided to turn it to account for economically generating electric power to be utilized in the different departments. The central station, situated near the new ovens, comprises a bank of 8 Belleville boilers, each having a heating surface of 100 square meters, fired by the gas of the 60 ovens already built, and two generating dynamos with their motors. The first is a triphase alternator, with its exciter, driven by a 250-H.-P. single-cylinder engine, the number of periods being 50 per second and the tension 250 volts. This current serves, in the first place, to work the motors at the coke ovens—such as those of the tipples and dischargers, and also for lighting the coke ovens and recovery works; but, as the above only require a portion of the current generated, the surplus is sent to a transformer, which raises the tension to 5,000 volts, and then to the main switchboard. The second generating dynamo is a 72-pole alternator of 4 m. diameter, mounted on the flywheel of a 500-H.-P. compound engine with Corliss valves; and the current of this alternator, which gives out 400 kilowatts when running at 75 revolutions per minute, is also triphase with 50 periods per second, the tension being 5,000 volts. These two alternators can be coupled in quantity, a special arrangement permitting the speed of the second alternator being varied, so as to afford an absolute synchronism of the periods; and the switchboard is also fitted with high-tension interrupters and a registering watt-meter, in addition to the necessary measuring instruments.

The 5,000-volt current is sent in three different directions—(1) to No. 3 pit by copper-wire cables of 15 square mm. sectional area, (2) to the Beuvry quay-wall, passing by No. 6 pit, by copper wires of 35 square mm. sectional area, the length of this line being 5 kms. and (3) to No. 7 pit, passing by pits Nos. 1, 2, 4 and 5, this line, the length of which is nearly 10 kms., being constituted by copper-wire cables of 100 square mm. sectional area up to No. 5 pit, and by cables of 25 square mm. sectional area between No. 5 and No. 7.

The first line is chiefly intended for supplying current at the shaft bottom (the surface buildings being lighted by the works' continuous currents); and with this object the 5,000-volt current is sent down the shaft by an armored cable comprising three conductors composed as follows: The three wires of 16 square mm. sectional area are wound with tarred filling, so as to form a single cable sheathed with lead, 2½ mm. thick, covered with asphalt and surrounded by steel wires capable of supporting the total load due to the length of 400 m. or 3.05 tons, this cable transmitting 350 H. P. at the above-named tension. A transformer at the shaft bottom reduces the tension to 250 volts, for working the 35-H.-P. electric hauling engine that raises the coal gotten from the level of 368 m. to that of 291 m.

Another application of electricity underground is that of hauling cars by locomotive; and the scheme was worked out by the colliery company in conjunction with the Societe Alsacienne de Constructions Mecaniques of Belfort. Inasmuch as all the Noeux pits have some fiery districts, the first condition was necessarily a complete absence of sparking in the air of the workings, so that the trolley system was out of the question and accumulators had to be used, whence it became necessary to transform the triphase into continuous current. The transformation and accumulator-charging station is arranged in proximity to the two (twin) shafts and as near as possible to the downcast, one end of the room communicating with the last-named shaft and the other with the upcast, so that the station can be ventilated by a special air-current not in communication with the workings. With this arrangement the presence of air charged with firedamp is impossible; and the gases evolved when the accumulators are charged, or the fumes produced by the accidental burning of an appliance, could in no case vitiate the air of the mine. The charging-station contains, according to the requirements, (1) one or more static transformers of 75 kilowatts which transform the 5,000-volt triphase currents into 93-volt triphase currents; (2) one or more 70-kilowatt converters for transforming the triphase currents into a continuous current of 130 volts tension; (3) the necessary appliances and the lines of way with arrangements for charging the accumulators; and (4) a traverser worked electrically (or, if necessary, by hand) for transferring the trucks of discharged accumulators to the charging-station and vice versa.

The electric locomotive had to satisfy the following conditions:

1. Be able to haul, with a speed of 11 to 12 kms. per hour, a set of 20 to

\*Abstract of article in the London "Colliery Guardian."

25 empty cars, each weighing 290 kgs. on a rising gradient averaging 8 mm. per meter (1 in 125).

2. Haul at the same speed on the same gradient, but falling, a similar set of cars, each loaded with 500 kgs. of coal.

3. Enter without any unshipment the cages now used in the several shafts.

4. Effect a forward and return run of 6 kms. without any recharging of the accumulators.

5. Possibility of recharging a set of accumulators during the time occupied by a run; and

6. Be perfectly safe in an atmosphere charged with firedamp.

Observations made underground with a dynamometric truck showed that the power required would not exceed that of fifteen horses, and that accumulators of 60 ampere-hours capacity with a tension of 100 volts would be sufficient. It was therefore impossible, owing to considerations of weight and the operation of charging, to carry the accumulators on the locomotive itself; and it was decided to carry them on a special tender, no larger than the engine in any direction.

The dimensions of the locomotive are: Power, 20 H. P.; voltage at the terminals, 100 volts; number of revolutions by the motor, 850; ratio of gearing, 1:6.9; two axles driven by pitch chain; diameter at wheel tread, 50 cm.; speed 11.5 kms. per hour; weight of locomotive alone, 2.85 metric tons; weight on each axle, 1.425 metric tons; gauge, 60 cm.; weight of rail, 12 kgs. per meter.

The four-pole dynamo with carbon brushes requires but little attention, while a very strong and air-tight steel case contains the collector and the brushes, into which case no air impregnated with firedamp can penetrate, because it is kept filled with compressed air. For maintaining the supply of air the locomotive carries behind the motor a small cylindrical plate-iron receiver, which is filled from time to time at the landing with air compressed to 5 or 6 kgs. per square centimeter taken off

180 and at the end 70 amperes, the duration being 30 minutes; and the accumulators must be recharged when the E. M. F. becomes reduced in running to 92-93 amperes. The weight of the truck and empty case is 1.5 tons, that of an accumulator 30 kgs. and that of the tender in running order 3.03 tons. The accumulators could be charged in 10 minutes if the transformers of the charging station were able to give out sufficient current. The plates are contained in ebonite boxes closed by india-rubber sheets with an insulating substance for preventing splashes of acidulated water; and an ebonite nipple, covered with an india-rubber cap, permits of filling the cells and also a disengagement of gas during the charge, while for avoiding fracture of the connections they are all made of lead. The case containing the elements is made of oak, strengthened by wrought-iron fittings, and lined with glass plates covered with gum lack, while an oak cover with india-rubber joint renders the case as tight as possible.

Careful trials of the locomotives were made above ground on a line of way laid down for the purpose with numerous S-curves of small radius and gradients up to 25 mm. per meter (1 in 40). The conditions of the contract were found to be perfectly fulfilled; and not only were 25 empty cars weighing in all 7 tons hauled at the stipulated speed on a rising gradient of 8 mm. per meter (1 in 125), but the engine was even able to start with these on a gradient of 25 mm. per meter (1 in 40). It also passed round curves of 10 m. radius at a speed of 11 to 12 km. per hour and curves of 6 m. at a lower speed.

#### THE AMERICAN STEEL AND WIRE COMPANY AT THE PARIS EXPOSITION.

The American Steel and Wire Company's exhibit at the Paris Exposition is one of the most complete and interesting to be found there. The installation is in the Department of Mines and Metallurgy, and



EXHIBIT OF THE AMERICAN STEEL AND WIRE COMPANY AT PARIS.

the underground service. The case can be put into communication with the receiver by means of a small pipe fitted with a cock, a safety valve limiting the air pressure; and a gauge within sight of the driver shows if the pressure is maintained. Where the driving axle passes through the sides of the case, tightness is ensured by a stuffing-box; and the spur pinion on this shaft is made of untanned hide. A hand-wheel, within easy reach of the driver, reverses the electromotor and switching in resistance coils, so as to give four different speeds in the two directions, the contacts and resistance coils being enclosed in airtight cast-iron boxes, and immersed in vaseline; and a powerful brake, the hand-wheel for working which is also within easy reach, permits of pulling up the train suddenly. An automatic interrupter, enclosed in a cast-iron box filled with oil, limits the intensity of the current, and advantageously replaces a fusible cut-out that could not be employed. Lastly, the couplings at the head of the locomotive and tail of the tender consist of a hook or a ring at the end of a steel wire rope, which is wound up by a spring drum when left to itself. The object of this arrangement is for rapidly uncoupling the engine in order to permit of a flying switch being made when required.

The battery of Tudor rapid-charging accumulators comprises 51 elements, having a capacity of 60 ampere-hours. With a constant voltage of 130 volts, the quantity of current at the beginning of the charge is

was not placed with the other exhibits from the United States for lack of space. On the main floor the exhibit occupies a space 50 by 50 ft. It comprises iron ores and coal from the company's mines in Michigan, Minnesota, Wisconsin and Pennsylvania; limestone from the quarries; coke from the ovens; pig iron from the blast furnaces, the quality and nature of the iron being illustrated by fractures; ingots, blooms and billets from Bessemer and open-hearth steel mills are also shown.

All these are compactly grouped near the entrance to the exhibit. In the center is an ornamental bronze pagoda with art glass roof, in which pagoda are panels illustrating various manufactured products, such as sections of beams, channels, angles and bars; sections of shafting, rail splices and frog filling; horseshoes, spikes, nails and tacks, barbed wires, bale ties, fine copper wires, music wires, fine spooled wires, all sorts of chains and rivets, coiled, spiral and flat springs, clock springs, wire ropes, insulated wires and cables, sections of sub-marine cables, etc.

In the space surrounding the pagoda are samples of sheet steel, with illustrations of quality in the shape of cold bending and stamping tests; large steel boiler heads, many bundles of woven-wire fences and galvanized netting. Piled in attractive pyramids are wire rods, steel and copper wire in bundles, and, on reels, copper trolley wires;

weatherproof and lead-encased cables; copper rail bonds, wire ropes and so on. The feature of the exhibition is the great variety of products shown. The entire range of the steel-producing industry appears to be covered by the products of this company, which is popularly, but erroneously, supposed to be confined to the wire industry.

The gallery or auxiliary exhibit consists of 40 large panels, 6 by 5 ft., on which are artistically grouped products of the various departments; while in glass cases beneath the panels, additional samples and test pieces are shown, the entire square being surmounted with 50 large photographic reproductions or birdseye views of the various mines, furnaces, steamships and manufacturing establishments owned and operated by the company. The entire exhibit was designed and arranged under the personal supervision of Mr. P. W. Moen, third vice-president, and Mr. F. H. Daniels, chief engineer. It was entirely set up, before shipment to Paris, in the Worcester plant, then taken down, shipped and reconstructed on the other side.

The awards included: Four grand prizes, two gold medals and a laboratory gold medal each to President Palmer and Chief Engineer Daniels, expressive of appreciation of their share in making such a showing for their company. The detailed awards were: One grand prize, class 26, for iron and steel galvanized telegraph and telephone wires, pure copper wires, insulated conductors, rail bonds, trolley wires, feeder cables for light and power, aerial, underground and submarine cables. One grand prize, class 7, music wire, for greatest tensile strength, ductility and finish. One grand prize, class 63, covering metallic ores, coal and coke; also natural mineral paints, such as Venetian red and coppers. One grand prize, class 64, covering pig iron, steel in ingots, bars, sheets, finished plates and wire rods; also copper and copper alloys, ingots, bars, etc. One gold medal, class 30, covering bicycle and carriage wire spokes and kindred products. One gold medal, class 65, a general metallurgical class, including wire nails and tacks, barbed wire, wire rope, horseshoes, woven-wire fencing, springs, chains, staples, wire netting and kindred products of the wire industry.

#### ABSTRACTS OF OFFICIAL REPORTS.

##### Philadelphia & Reading Coal and Iron Company.

This company, which is controlled by the Reading Company, which is—since the last reorganization—also the controlling owner of the Philadelphia & Reading Railroad, owns a great coal estate in the anthracite region of Pennsylvania. Its report is for the year ending June 30th, 1900.

The property is represented by \$8,000,000 stock, owned by the Reading Company, and \$5,772,147 bonds and mortgages. In addition the Coal and Iron Company owes the Reading Company \$78,653,349 for advances made to pay interest, meet deficits, etc. The total investment appears on the balance sheet at \$87,384,978, of which \$61,678,138 is for coal and timber lands; \$13,092,635 for colliery improvements, equipment and dead-work; \$9,814,746 for securities of companies controlled; and \$2,799,459 for buildings, coal depots, etc.

The statement of earnings and expenses for the year, as compared with the previous year, is as follows:

	1899.	1900.	Changes.	Per ct.
Total earnings	\$23,643,838	\$27,884,644	I. \$4,240,806	17.9
Total expenses	22,742,103	26,682,731	I. 3,940,628	17.3
Profit in operating	\$901,735	\$1,201,913	I. \$300,178	33.3
Fixed charges	478,697	459,848	D. 18,849	3.9
Balance	\$423,038	\$742,065	I. \$319,027	75.4
Per ct. of expenses to earnings	96.2	95.8	D. 0.4	....

Adding the surplus from 1899 to that for 1900, the total available balance was \$1,165,103. From this \$884,850 was paid to the Reading Company, being 1½ per cent. interest on the advances due. This left a balance of \$280,253. The total net balance last year was 0.85 per cent. on the investment noted above.

The coal mined by this company and from its lands was as follows, in long tons:

	1899.	1900.	Increase.	Per ct.
By company:				
From lands owned	5,612,221	6,461,557	849,336	15.1
From lands controlled	349,333	365,247	15,914	4.6
From other lands	1,195,180	1,205,147	9,967	0.9
Total	7,156,734	8,031,951	875,217	12.2
By tenants:				
From lands mined	926,057	1,071,337	145,280	15.7
From lands controlled	100,853	116,477	15,624	15.5
Total	1,026,910	1,187,814	160,904	15.7

The total coal mined from the company's lands last year was 8,014,618 tons, against 6,988,465 tons in 1899; showing an increase of 1,026,153 tons. The coal bought by the company was 1,125,467 tons, against 1,195,382 tons, showing a decrease of 69,915 tons. Of the coal purchased last year 707,385 tons were from tenants on the company's lands, and 419,082 tons from other parties. In the previous year the figures were 639,889 and 555,403 tons, respectively.

The total coal sold by the company was 9,379,427 tons, which was made up as follows: Mined by company, as above, 8,031,951 tons; purchased from tenants and others, 1,125,467 tons; sold from stock, 204,122 tons. This statement, as given in the report, leaves a discrepancy of 17,887 tons. These figures relate to anthracite only. The company bought bituminous coal for which it paid \$569,615, and it received \$625,638 for bituminous coal sold; but the quantity of this coal handled is not stated.

The gross revenue from anthracite coal was \$2.91 per ton sold. The net profit in operating, as given above, was 12.8c. per ton; and the balance after paying fixed charges was 7.9c. per ton.

An analysis of the total receipts may be made as follows:

	Total.	Per ton.
Coal sold, 9,379,427 tons	\$26,790,752	\$2.86
Coal rents, 1,187,813 tons	256,119	0.22
Land rents, interest, etc.	212,135	0.02
Revenue from anthracite	\$27,259,006	\$2.91
Bituminous coal sold	625,638	....
Total revenue	\$27,884,644	....

The revenue from bituminous coal and the cost of its purchase are separated, in order to make the averages as correct as possible. An analysis of the company's expenditures for the year is as follows:

	Total.	Per ton.
Mining 8,031,951 tons	\$11,150,378	\$1.39
Royalty on collieries	573,918	0.07
Taxes	284,505	0.03
Repairs, damages, etc.	26,132	....
Colliery improvements	750,499	0.09
Depletion of coal lands fund	750,154	0.09
Coal purchased, 1,125,467 tons	1,852,208	1.65
Coal sold from stock, 204,122 tons	269,555	1.32
Cost at mines of coal sold, 9,379,427 tons	\$15,657,349	\$1.67
Transportation by rail	\$7,493,438	\$0.80
Transportation by water	1,549,863	0.17
Handling at depots	425,203	0.05
Commissions, etc.	987,263	0.10
Cost of marketing 9,379,427 tons	\$10,455,767	\$1.12
Total cost of anthracite sold	\$26,113,116	\$2.79
Bituminous coal bought	569,615	....
Total expenses	\$26,682,731	....

The two statements combined show a profit of 12c. per ton, which is somewhat less—0.8c.—than that given above. The difference is due to the profit of \$56,023 on bituminous coal sold, which is included in the first statement.

The accounts of the miners' beneficial fund show 24,954 contributors. Receipts for the year were \$118,823, of which \$117,303 came from contributors and \$1,520 from interest. Payments were: Families of 149 contributors killed, \$31,685; to 4,181 contributors for injuries, \$83,044; dues refunded, \$271; total \$115,000. The surplus was \$3,823, which deducted from the debit balance of \$28,220 from the previous year, left a balance of \$24,397 at the close of the year. The endowment fund is \$20,000.

The Philadelphia & Reading Railroad carried in all 15,212,275 tons of coal during the year, of which 10,672,566 tons were anthracite and 4,539,719 tons bituminous coal. The coal ton-miles were 1,643,836,143, the average haul being 108 miles. The total railroad earnings on coal were \$11,371,203, and the average earnings per ton-mile were 0.69c. No division is made between the earnings or average rates on anthracite and bituminous coal. In addition to the rail earnings, the company received \$1,355,655 from its steam colliers and coal barges. The expenses of operating this floating equipment were \$818,548. The expense of transporting coal is not given separately in the report.

The report says: "The total production of anthracite coal from lands owned and leased by the Philadelphia & Reading Coal and Iron Company in the year 1899-1900 was 9,219,765 tons, an increase of 1,036,121 tons over the production of the previous year, or 12.7 per cent., the production of the whole region having increased in the calendar year 1899 about 13.8 per cent. over the production of the year 1898. The coal purchased aggregated 1,125,467 tons, a decrease of 69,914 tons, or 5.9 per cent., and the sales amounted to 9,379,427 tons, an increase of 1,076,083 tons, or 13.0 per cent. over the previous year. The coal mined and the coal sold in this fiscal year were larger than in any previous year in the company's history. The cost of coal mined and purchased for the year was \$1.667, which is 7.8c. higher than the cost for the previous year. This resulted principally from the increased cost of labor due to the basis of wages paid being higher than during the year 1899; the much higher prices paid for materials used, and to the largely increased amount expended for colliery and other improvements. All work done at the collieries and all additions made to their structures have been charged to cost of coal.

"The work which has been carried on for several years with the purpose of reducing the number of separate workings and of increasing the average output of the collieries, and thus lessening the cost of each operation, has been carried so far that whereas in June, 1893, 54 collieries produced a daily average of 38,160 tons, or 706 tons per colliery per day in June, 1900, 40 collieries produced a daily average of 47,849 tons, or 1,196 tons per colliery per day. The decrease in the number of collieries has been caused by the closing of worked-out collieries, and of collieries of which the working was excessively costly, and by the consolidation of contiguous collieries. The collieries have still a capacity of daily production in excess of the maximum amount that they are likely to be called upon to produce, and they and all their appliances are in thoroughly good order.

"The funded indebtedness of the Coal and Iron Company has been reduced \$1,374,000 this year by payments on account of the principal loans, leaving a balance still outstanding of divisional mortgages \$400,000, the larger part of which mature in 1904; of collateral sinking fund loan, \$1,555,000; and of bonds and mortgages on real estate, \$117,147. In accordance with the plan of reorganization, the divisional mortgage bonds and the bonds and mortgages on real estate were paid off by the issue of an equivalent amount of 4 per cent. general mortgage bonds. The additional amount of cash required in this transaction was furnished as provided in the plan of reorganization. The transaction resulted in an annual interest saving of \$26,270.

"From the revenues of the Coal and Iron Company there was set aside the sum of \$750,154 arising out of a charge of 5c. per ton on all coal mined from the company's lands in the two years ending June 30th, 1900. This charge should be made in every year, as each year's mining depletes the company's estate."

**COAL IN THE CAUCASUS.**—The recent accidental discovery of coal deposits on the estate of the Crown Villa of Tkvartschevsk, near the small town of Otchemtchiri, in the Caucasus, and situated only about 30 versts from the coast of the Black Sea, has been followed by expert researches, which show that the coal bed, which is of considerable depth and breadth, extends in an unbroken form for a distance of 40 versts (27 miles). M. Yermoloff, Minister of Agriculture and Crown Domains, has just made a careful inspection of the property, and has granted a concession for the exploitation of this new coal-field to a syndicate.

GOLD MINING IN THE PHILIPPINES.

Written for the Engineering and Mining Journal by G. D. Rice.

Generally speaking, in the Philippines, gold is found either in alluvial deposits or in ledges and veins. The former, or placer mines, is the best paying at the present time. There are a number of miners making good returns on rivers where rich deposits have washed for a great many years. The writer lately investigated this class of mining in the Philippines and found that a number of discharged soldiers and civilians were making considerable money from operating on the river banks in the foot-hills. The gold is found in the beds and along the banks of rivers which have their sources up in the mineral bearing mountains of Luzon, Panay, Mindanao and one or two other islands.

Some miners in the Philippines claim to have made large profits by working the sands and beaches on the sea coast. I saw one place along the beaches of Panay where there was mining apparatus in operation for a mile or more getting out the gold deposits, which probably had been washed into the ocean in the currents of some river and deposited along the shores. The gold obtained seemed to be very fine and worn



PROSPECTORS CROSSING RIVER IN THE PHILIPPINES.



TIGBAUAN, A PHILIPPINE MINING TOWN.

smooth by long action of the waters. Evidently the original lodgment of this gold was in some far away mountain, and it was washed to the seas by the rivers. Much of this gold was invisible and would be classed under the head of flour gold.

Placer gold in the Philippines always has a smoother appearance for the reason that it is tumbled about in the ravines and along the river courses for a long time before it reaches a place of deposit in the shores of some river or at the beaches. The natives have been at work getting gold for nearly 100 years, and some of them have secured large stores of the valuable metal without knowing its true value. I have entered nipa shacks of the natives for a resting place through the night and have been shown the collections of gold and other metals of the native father and his family. Although the shack may not be worth \$10 and there may be a shortage of the necessities of life, the native miner will be able to exhibit a bagful of nuggets about the size of peas, most of them being flattened and worn. Flour gold, too, will be seen, but this is the kind that the native sells or disposes of in some way first and he keeps the nuggets. In fact, in almost every portion of the archipelago, until the past few months, there has been practically no profitable way for the native miner to change his treasure into commercial money. He has had to do his bartering with gold and frequently the gold has had but little current value in sections of the islands which have been cut off from the outside world. I have seen natives in actual want, who were possessors of little boxes of gold.

A far richer field to work in the Philippines than prospecting just now is to go among these isolated mountain towns and barrios for the

purpose of purchasing this accumulation of gold in the hands of natives who have not the ability to dispose of it. There are many of the natives who never go more than 5 miles from their homes during their lives and they might have several thousand dollars' worth of gold which they have collected since they could work, and have not been able to get the benefit of it for want of means for changing it into commercial money. Large amounts of this gold could be brought up and shipped to the sea coast for transportation to America or other countries and the returns would be profitable.

It is evident that there will not be any extensive mining operations in the Philippines until parties with capital enter the field and put up stamp mills or smelting plants. There are some rich lodes in the mountains of the southern islands of the Philippines and in less than five years some of the promoters of mining schemes there are going to make a great amount of money. There are thousands of natives available for service in the mines at the low rate of wages of 10 to 15c. per day, while there are a great number of Chinese coolies here who would work for even less than that. There are at present some American mining concerns represented here, and steps are being taken to put in necessary equipment to utilize the veins of quartz which have been located. I have been through the mining sections of Panay, part of Luzon, Mindanao and several other islands, and in every instance the samples of gold ore were promising.

The accompanying illustrations are from photographs. The first shows the kind of country through which the prospector must make



NATIVE PHILIPPINE MINER.

his way. The second is a view of a village in which nearly all the people are more or less engaged in gold mining; while the third is a portrait of a native miner.

**LIQUID AIR.**—For obtaining an exact idea as to liquid air there is a very simple method, in the opinion of M. Robert Pitaval, who makes this observation in "L'Aluminium," and that is to consider it as the extreme limit of compressed air, when one can easily conceive that it may be employed as a refrigerating agent, as motive power, and as explosive force. Again, its composition sufficiently indicates that it may be a source of oxygen which, as is well known, has many uses; but the success of all these applications depends upon a principal factor, which is the sale price, and consequently the cost price of liquid air. This substance may, in fact, serve to afford liquid oxygen owing to the differences of volatility in the two elements which compose it. By evaporating one-half a given mass of liquid air a concentration of oxygen to 85 per cent. is obtained, and, on pushing the evaporation further, nearly all the nitrogen may be eliminated.

**RUSSIAN LICENSES FOR TRAVELING AGENTS.**—Mr. Peirce, United States Charge at St. Petersburg, sends under date of September 29th, 1900, translation of a note from the Russian Ministry for Foreign Affairs, the substance of which follows: "A notice of the Council of the Empire, sanctioned by the Emperor on June 5th, 1900, which is to take effect from January 1st, 1901, authorizes commercial firms and industrial enterprises, both Russian and foreign, which do not pay less than 150 rubles (\$77.25) as impost on the industry, to avail themselves of traveling agents in Russia. The traveling agents will be held, as formerly, to pay a personal tax of 50 rubles (\$25.75) per annum. By the time this law will take effect, the Ministry of Finance will elaborate detailed rules with regard to the delivery of the industrial license, as well as for the payment of the supplementary taxes by foreign firms and by their traveling agents. Copies of the rules will be sent the United States Embassy at St. Petersburg."

## MINERAL COLLECTORS' AND PROSPECTORS' COLUMN.

(We shall be pleased to receive specimens of ores and minerals, and to describe and classify them, as far as possible. We shall be pleased to receive descriptions of minerals and correspondence relating to them. Photographs of unusual specimens, crystals, nuggets and the like will be reproduced whenever possible. Specimens should be of moderate size and should be sent prepaid. We cannot undertake to return them. If analyses are wanted we will turn specimens over to a competent assayer, should our correspondent instruct us to do so and send the necessary money.—Editor E. & M. J.)

229.—Chemical Composition of Turquoise.—S. L. Penfield in the "American Journal of Science" discusses at length, the probable composition of turquoise, this mineral being regarded by some mineralogists as made up of an aluminum phosphate mixed with a copper salt as coloring material. The specimens examined were from deposits in the Los Cerillos Mountains, New Mexico, and the Crescent Mining District, Lincoln County, Nevada. A fragment of exceptional purity from the last locality was carefully examined and analyzed. Under the microscope a thin section proved to be so fine grained as to give no cue to the crystallization, though acting somewhat on polarized light. A comparison of analyses by various persons shows that the chemical composition of the mineral is quite uniform, so uniform that there seems no reason for considering it an accidental mixture. The author concludes that turquoise may be regarded as a derivative of ortho-phosphoric acid in which the hydrogen atoms are to a large extent replaced by a univalent radical, the small amounts of copper and iron being regarded as constituents rather than impurities. The composition of the mineral may, therefore, be expressed by the formula  $[Al(OH)_2, Fe(OH)_2, Cu(OH), H]_2 PO_4$ .

230.—Tests for Carbonates.—A quick and easy test for carbonates is often needed by the prospector or mineralogist. When working in the laboratory hydrochloric or nitric acid is at hand, but these strong acids are not well adapted for carrying about in a small outfit for field work. A broken or leaking bottle may cause considerable damage, and liquids at best are not to be recommended for a field outfit. Acids that can be carried in crystalline form are a good substitute. The best of such acids, as shown by recent tests, is tartaric acid.

231.—Calcite crystals stained with cinnabar, and making very desirable cabinet specimens, are found in the quicksilver mines at Terlingua, Brewster County, Texas. A beautiful specimen was recently received in Chicago.

232.—Florencite.—This is described as a new hydrated phosphate of aluminum and the cerium earths recently examined by Hussak and Prior. It was first found very sparingly in the cinnabar-bearing sands of Tripuhy, near Ouro Preto, Minas Geraes, Brazil, where it is associated with monazite, xenotime and the titanio-antimonates, lewisite and derbylite. It also occurs more abundantly in diamond-bearing sand from Matta dos Creoulos, near Diamantina, and with the well-known yellow topaz at Morro do Caixambu. It occurs in rhombohedral crystals. Cleavage basal, fairly perfect; fracture splintery to subconchoidal; hardness about 5; specific gravity 3.58; luster greasy to resinous; color clear, pale yellow.

The mean of two analyses by Prior gave:

P <sub>2</sub> O <sub>5</sub>	Al <sub>2</sub> O <sub>3</sub>	Ce <sub>2</sub> O <sub>3</sub> (etc.)	Fe <sub>2</sub> O <sub>3</sub>	CaO	H <sub>2</sub> O	SiO <sub>2</sub>
25.61	32.28	28.00	0.76	1.31	10.87	0.48 = 99.31

For this formula is deduced 3 Al<sub>2</sub>O<sub>3</sub> Ce<sub>2</sub>O<sub>3</sub> 2P<sub>2</sub>O<sub>5</sub> 6H<sub>2</sub>O, not far from that of hamlinite.

## QUESTIONS AND ANSWERS.

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert. Nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.—Editor E. & M. J.)

Coating Boiler Tubes.—Has a successful protective coating ever been devised for boiler tubes, to prevent the pitting of same by gases in the water or other causes? If so, what is it, and by whom made?—H. E. S.  
Answer.—Various protective coatings have been devised, and some of them have been advertised quite extensively. We do not know of any which has proved entirely successful in preventing the pitting of boiler tubes, where bad water is used.

Roll Shells and Crusher Plates.—I would like to get some information as to how roll shells and crusher plates are made. Can you indicate some books upon the subject?—L. K.

Answer.—Methods of manufacture and materials used vary with the different makers of rolls and crushers. Chilled iron, steel, chrome steel, manganese steel, have all been used. At present the best information you can get on this point is from the catalogues of the large manufacturers of machinery. Prof. Richards' book on "Ore Dressing," now in preparation by the Scientific Publishing Company, will give full information on these points.

Weights of Steel Pipes.—I would like to know the weights per foot of a 26-in. diameter steel pipe of No. 14 wire gauge steel; also for 24-in. pipe, No. 12 wire gauge steel, 18-in., and 16-in. pipes, No. 14 wire gauge. The riveting to be a double row, 1¼-in. between centers of rivets and ½ in. between centers of rows; rivets staggered.—B. R.

Answer.—The latest tables give the weights of spiral riveted pipe, 26-in., No. 12 wire gauge, at 36 lbs. to the lineal foot; 24-in. pipe, No. 12 wire gauge, 26.2 lbs. to the foot; 18-in. and 16-in., No. 14 wire gauge, 20 lbs. and 17.9 lbs., respectively. This pipe is single-riveted; a very simple calculation will give you the additional weight due to double riveting.

Nickel Prices and Exports.—On September 28th, 1900, London quotations of metallic nickel, as given in London trade journals, were £165 to £175 per ton of 2,240 lbs. This price is equivalent to approximately 37c. per pound. On October 6th, 1900, you state in your "Journal" as the price of metallic nickel in New York, 50 to 60c. per pound; and further, that the exports to Europe of nickel and nickel products were 3,928,278 lbs. for the 8 months ending August 31st, 1900. Is there not a discrepancy somewhere? As it would hardly seem possible to export nickel from a 50 or 60c. market to one of 37c., even considering the United States import duty of 6c. per pound on metallic nickel.—M. B. S.

Answer.—The statements do look somewhat paradoxical; nevertheless the figures given are correct. The fact is that the market for nickel is a limited one, and it would be impossible to sell here all the nickel refined in this country. The makers must export it to find a market, and sell it abroad in competition with others. No doubt, if they could sell the whole output here for 50c. a pound they would do so, rather than take 36 or 37c. in London. The case is very different from that of a metal of which the production and sales are large, like iron, copper or lead.

"The Mineral Vaporizing Company."—I enclose with this a booklet issued by the "Mineral Vaporizing Company," regarding an alleged invention of a furnace for reducing low-grade ores at a profit. It impresses me as being the most transparent kind of a fake; still, I have some acquaintances who are contemplating investing some money in the stock. If not inconsistent, would be thankful to have your general opinion of it. From the many exposures of confidence games in mining matters you have made during the past few years, I am inclined to think you will not object to giving me your opinion. I regard this scheme as being on a par with that of the Rev. Jernigan, who proposed to extract gold from the ocean water a few years ago.—J. C.

Answer.—The booklet which you send us is so outrageous an attempt on credulity that we are willing in this case to depart from our usual custom and give an answer in a case of individual investments. We agree with you that it is a very transparent fake. The two passages which we quote below are enough to condemn it:

"The system owned by the Mineral Vaporizing Company reverts to nature's process, developing a veritable volcanic heat approximating over 5,000° F. In this lies the essence of the invention. So high a degree of heat is produced that all the metals contained in the crushed ore subjected to its action are driven off in the form of vapor. This vapor is then condensed by a simple process and a mat of metal is produced. The metals most usually found in refractory ores are vaporized in the following order: First, lead; second, copper; third, zinc; fourth, silver; and, lastly, gold. The metals so released and precipitated assume the form of regular layers in the mat and can be readily separated into sheets, the gold and silver being in the form of bullion . . . ."

"As a result of 20 years' study and experiment, the inventor has discovered the process by which the metal-boiling ore-forming heat of nature was developed. He has overcome every obstacle and perfected a furnace that will develop and keep constant a degree of heat sufficient to reduce refractory ores to the fluid or pulposus condition, in which every particle of contained metal is driven off in the form of vapor. In this furnace a degree of heat is produced that reduces asbestos to ashes in 6 minutes, causes graphic crucibles to speedily crumble, converts almost immediately all metals to a fluid state, and causes them to assume a vaporous form. This vapor is afterward condensed in a metal cylinder, through the medium of water."

Such trash as this is hardly dangerous, except with very ignorant people. The hook is too bare to attract any but the most innocent "sucker."

## PATENTS RELATING TO MINING AND METALLURGY.

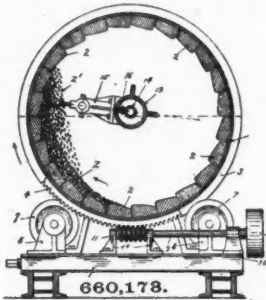
## UNITED STATES.

The following is a list of the patents relating to mining and 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 October 23d, 1900.

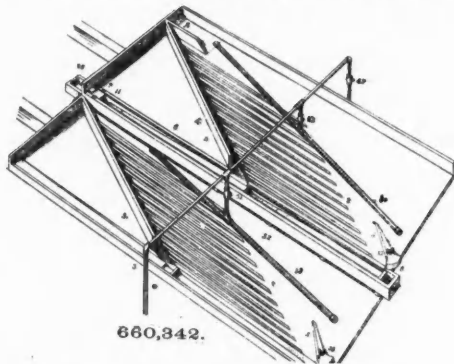
- 660,094. PROCESS OF TREATING KRYOLITH. Charles A. Doremus, New York, N. Y. The process of converting kryolith into sodium aluminate and hydrofluoric acid, which consists in passing steam through or over and into contact with the kryolith at a temperature below a white heat.
- 660,116. PROCESS OF SEPARATING TIN FROM TIN SCRAP. Otto Meyer, Richmond, Va., assignor of three-fourths to Simon B. Block and Henry Froehling, same place. The process consists in subjecting the scrap or plate to a strong bath composed of muriatic acid, which acts as an electrolyte, but which in itself does not appreciably attack the tin of the scrap, but does attack the iron of the scrap after the tin is removed, forming protochloride of iron, which forms an electrolyte in itself, and connecting the tin scrap in bulk with the positive pole of an electric generator and forming an anode, and connecting a sheet of metal with the negative pole of the electric generator and forming the cathode, and subjecting the scrap to an electric current which is maintained at such uniform and high degree of amperage, as to continuously deposit the tin on the cathode in the condition of a dense sponge, and cutting off the current after the tin is removed from the scrap and removing the remaining iron of the scrap, and introducing new lots of tin scrap without having to replenish the bath by the addition of muriatic acid at the end of each operation.
- 660,187 and 660,188. BRICK-MACHINE. Walter P. Grath, St. Louis, Mo. A brick-machine comprising a framework, a mold having movable plungers constituting the top and the bottom thereof, a lever pivoted in the framework, links connecting the respective ends of said lever to said plungers, a draw-bar co-operating with said lever and links to constitute a toggle for operating said plungers, a lever or levers fulcrumed in said framework and pivotally connected to said draw-bar, a cam or cams of increasing power for operating said lever, and means for actuating said cam or cams.
- 660,173. METHOD OF TREATING REFRACTORY ORES. John C. Teller, Minneapolis, Minn., assignor to the Minnesota Ore Reduction Company, same place. The method consists in placing a body of pul-

verized ore within a tubular shell, rotating the shell with such velocity as to cause successive portions of the ore to be carried upward past the horizontal plane, passing through the axis of the



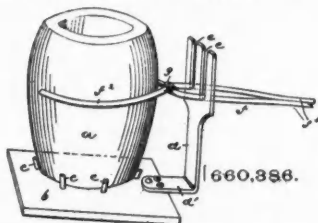
shell, whence they fall in a free shower of separate particles, and projecting a flame through the falling particles.

- 660,220. **FUSE IGNITER.** John T. Nagle, Butte, Mont. An igniting device for fuses, consisting of a suitable tube, a composite combustible filling therein extending beyond one end of the tube to form an exposed portion, a friction-match tip embedded in the composite filling, and a waterproof coating covering the exposed portions of the filling and the match tip.
- 660,228. **PLATE OR ELEMENT FOR STORAGE BATTERIES.** Elmer A. Sperry, Cleveland, Ohio. The material for the plates or elements of storage batteries consisting of a set mass, composed of an intimate mixture of an alkali-metal salt, lead oxide, and finely-divided lead, moistened with a solution of a hydroxide of the alkali metals.
- 660,253. **APPARATUS FOR PUMPING OR COMPRESSING GAS AND AIR.** James Keith, London, England. A double-acting gas-compressing pump comprising a cylinder, a pump plunger moving therein having gas pipes for the inlet and discharge of the gas to and from the upper and lower sides of the plunger, a loaded gas holder or receiver surrounding the pump plunger and cylinder, a fluid-pressure motor for operating the pump plunger, a cock controlling the supply of fluid to said motor, and a connection between said cock and loaded gas holder.
- 660,341. **SAFETY FUSE.** Joseph Sachs, Hartford, Conn. A safety fuse comprising a case and a filling of non-conducting material and a fuse strip therein of thin flat metal of extended area.
- 660,342. **ORE SEPARATOR.** Jonathan P. Smith, Denver, Colo., assignor of one-half to Alexander H. B. Harenc and John A. Lehritter, Salida,



Colo. Inclined tables having the longitudinally-disposed guides, the diagonally-disposed slime conveyors arranged with reference to the guides as shown, and an independent return conveyor.

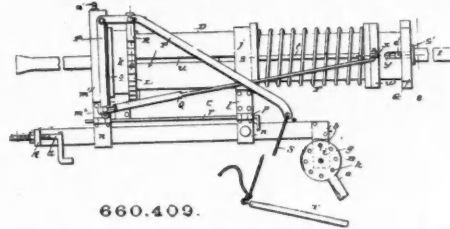
- 660,366. **MATCH COMPOSITION.** Juan Craveri, Buenos Ayres, Argentina. A safety-match igniting material containing cyanogen persulphide, persulpho-cyanic acid, xanthate of potassium, sulphide of antimony, and gelatine.
- 660,373. **POWDER MIXING AND INCORPORATING MILL.** Francis A. Halsey, San Rafael, Cal. In combination with a bed-plate having an annular peripheral channel and runners mounted upon radial arms and adapted to travel in said channel, a vertical centrally-disposed shaft, a sleeve fixed to said shaft, mechanism by which motion is communicated to rotate said sleeve.
- 660,386. **CRUCIBLE SHAKER.** William S. Mather, Newark, N. J. A crucible shaker, comprising a base-plate, a shaking-lever having upright



legs at opposite sides of the crucible, said legs being fulcrumed at their lower ends on said base plate and being provided between said legs with means for grasping the crucible.

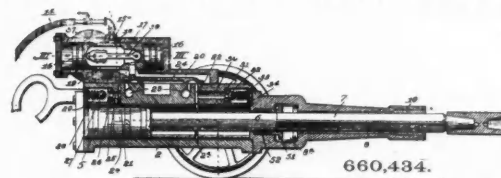
- 660,387. **CRUCIBLE SHAKER.** William S. Mather, Newark, N. J. A crucible shaker, comprising a base-plate, a shaking-lever having upright legs at opposite sides of the crucible, said legs being fulcrumed at their lower ends on said base-plate and being provided between said legs with means for grasping the crucible.
- 660,398. **HYDRAULIC PRESS.** George A. Sauer, Dayton, Ohio, assignor to the Buckeye Iron and Brass Works, same place. A ram adapted for use in hydraulic presses, consisting of a hollow body portion provided with a pair of recesses, an annular seat in the top thereof, and having the peripheral edge of the top beveled, a cap for said body portion of the same relative diameter, formed with a recess in its upper side and having the peripheral edge of the bottom beveled, a rabbit carried by said cap and adapted to engage the seat of the body portion, means extending through said cap and engaging in the said recesses for detachably securing the cap to the body portion, and a lifting lug formed integral with said cap and arranged within the recess thereof.
- 660,409. **ROCK DRILL.** Charles E. Young, Fremont, Wash. The combination of a suitable support, a drill-rod holder mounted on the sup-

port and movable endwise with respect thereto, a spring interposed between the holder and support for cushioning the forward movement of the former and returning it to its normal position subse-



quent to such movement, and a drill rod arranged in the holder and having a limited endwise movement with respect thereto whereby it is enabled to move endwise in the holder precedent to the movement of said holder against the tension of the spring.

- 660,426. **MANUFACTURE OF ARTIFICIAL STONES.** Samuel Grossiord, Aux Moussieres, France. An artificial stone for use in jewelry consisting of clear, transparent window glass and paste welded together in a single piece.
- 660,434. **MINING MACHINE.** John Herzler, Henry Henninger and William Fenner, Belleville, Ill. The combination with the main cylinder, of a piston and rod operating therein, a valve-operating engine cylinder having communication with said main cylinder and having connection with a source of air supply, a slide valve arranged to



control the communication between said cylinders, and a double-headed piston located in said valve-operating engine cylinder arranged in engagement with said slide valve and provided with a port through which air is admitted from the source of supply through the piston.

- 660,451. **CONVEYOR.** George W. McCaslin, Hoboken, N. J. An endless chain and buckets pivotally suspended therefrom and provided with overlapping lips, and means to effect the change in the lapping of the lips by tilting the buckets backward only.
- 660,458. **APPARATUS FOR FEEDING FINE FUEL.** Harry B. Pruden, Pittsburg, Pa. The combination with the combustion chamber, of an egg-shaped receptacle, chains connected to said receptacle and to a suitable support, air-supply pipes connected to said receptacle at different sides thereof, deflecting plates secured to the inner face of the receptacle at the discharge of each of said pipes for projecting the air from each pipe in the same path of travel with the receptacle, a feed pipe having a hopper mounted on said receptacle, a feed-regulating valve in said feed pipe, and a discharge pipe connected at its one end to the receptacle and at its other end provided with a bell-shaped mouth communicating with the combustion chamber.
- 660,477. **SOAKING-PIT CRANE.** Samuel T. Wellman, Charles H. Wellman and John W. Seaver, Cleveland, Ohio. The combination of gripping tongs, a raising and lowering device for the gripping tongs, a single drum having chains connected to the different elements of said raising and lowering device, and means for pulling upon and slackening the chain of one element independently of the movement imparted to the chains by the drum.
- 660,480. **COKE OVENS.** Edwin A. Babbage, Cambria, Wyoming. In combination, a row of coke ovens having smoke-passages leading therefrom about horizontally in the same direction, thence vertically, a second row of coke ovens located opposite the spaces be-



tween the first-mentioned row and having smoke-passages leading therefrom in an approximately horizontal position, thence vertically, the vertical passages of one row of ovens coming opposite the spaces formed between adjacent ovens of the opposite row.

- 660,498 and 660,499. **APPARATUS FOR LEACHING ORES.** James A. Fleming, Globe, Ariz. A tank having nipples alongside and communicating with it at different heights, and a tube introduced through its top and movable up and down whereby it may be adjusted to different heights, and said tank having, at its top, nipples for the introduction of and withdrawal of chemicals all substantially as described whereby the solution may be introduced or withdrawn above the mass of ore or from any height at the interior or exterior of such mass of ore.
- 660,518. **CEMENT-AND-STEEL CONSTRUCTION.** Frederick Melber, Pittsburg, Pa. In cement or concrete construction, metal reinforcing-bars, unattached at their ends to other metal reinforcing-bars, embedded therein transversely to the calculated shearing strains.
- 660,533. **METHOD OF ANNEALING AND OXIDIZING METAL SHEETS OR PLATES.** Bernard R. Parr and Harry E. Sheldon, Leechburg, Pa.; said Parr assignor to said Sheldon. The method consists in placing the sheets or plates in a closed vessel so disposed therein that intervening spaces are formed between the sheets or plates, then raising the sheets or plates to an annealing temperature and subsequently gradually cooling the said sheets or plates to a point at which oxidation ceases and during said cooling and while the plates are still in the closed vessel, exposing them to the action of an oxidizing agent.

GREAT BRITAIN.

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

Week Ending September 22d, 1900.

- 11,440 of 1899. **CONCENTRATOR.** J. Buss, London. A concentrating table with a rising oblique motion in addition to horizontal motion.
- 19,790 of 1899. **MINER'S LAMP.** W. Gay, Pontypridd. Method of locking together the various parts of miners' safety lamps.
- 12,263 of 1900. **BURNING PULVERIZED FUEL.** J. Bole and D. Patterson, Allegheny, Pa., U. S. A. Pulverized fuel for boiler furnaces, burning the fuel in a preliminary furnace, with an air blast.

## PERSONAL.

Mr. Harold Boedtker, late of San Diego, Cal., is now assayer for the Verde Queen Company, of Jerome, Ariz.

Mr. Thomas J. Walsh, owner of the Camp Bird Mine, Ouray, Colo., arrived in New York from Europe this week.

Prof. T. G. Bonney has resigned the chair of geology in University College, London, which he has held for 33 years.

Mr. Louis Janin, Jr., is now superintendent of the Dorcas Mining, Milling and Development Company at Florence, Colo.

Mr. A. G. Berry, who is connected with the Cape Government railways in South Africa, has been visiting Pittsburg steel plants.

Mr. John Russell, an old Colorado mining man, has taken charge of development work at the Pauper Mine near Silver City, Idaho.

Mr. John A. Walker, vice-president and general manager of the Joseph Dixon Crucible Company, Jersey City, N. J., is on a trip to Europe.

Mr. Henry Bratnover, who has been in Alaska, is in Butte, Mont. He was at one time manager of the Drum Lummon Mine at Marysville, Mont.

Prof. A. G. Leonard, of the University of Missouri, has been elected to the chair of mining and mineralogy at the University of Idaho at Moscow.

Mr. G. D. B. Turner, manager of the Red Bluff group of mines, near Norris, Mont., has gone to Montreal, to present his annual report to the stockholders.

Dr. Hans Georges, engineer-in-chief of the firm of Siemens & Halske, has been appointed professor of electrical engineering in the Dresden Institute of Technology.

Capt. James Morrish, consulting engineer of the New Goldfields of British Columbia, after a two-months' visit to the Velvet Mines in B. C. has returned to England.

Mr. G. E. Tomlinson, recently of Pasadena, Cal., has been appointed chemist and assayer for the Copper Queen Consolidated Mining and Milling Company of Bisbee, Ariz.

Messrs. Henry Cooper, of Sheffield, and H. B. Weeks, of London, connected with Vickers' Sons & Maxim, England, the gun and armor makers, were in Pittsburg, Pa., last week.

Mr. Bernard MacDonald, general manager of the Le Roi and the British America Corporation at Rossland, B. C., has returned to that city from his short visit to England.

Mr. Frank Owen, mining engineer of London, England, sailed October 27th for Ashanti, West Africa, in charge of a prospecting and mining expedition organized by an influential English company.

Mr. T. H. Leggett, former manager of the Standard Consolidated Mining Company, Bodie, Cal., has been in New York City and contemplates returning to Johannesburg, S. A., about January 1st, 1901.

Mr. Joseph Leveque, of Brussels, Belgium, managing director of the Lembecq seamless pipe works, at Lembecq, near Brussels, is in this country for the purpose of acquiring some information on the manufacture of boiler and bicycle pipes.

Mr. Paul Staritzky, of Moscow, Russia, is spending several months in the United States in the interests of the Russian Technical Society, of which he is the head. He is visiting locomotive and car works for the purpose of learning something of the American methods.

Mr. Lee H. Bowman, of the armor plate department of the Homestead Steel Works of the Carnegie Steel Company, has returned from Russia, where he has been superintending the placing of some armor plate on Russian vessels. He expects to return to Russia next spring.

Mr. C. H. Thompson, mining engineer, has resigned his position as assistant superintendent of blast furnaces and mines with the Empire Steel and Iron Company, to become manager of the Victoria Coal and Coke Company's plants on New River, W. Va., with office at Caperton.

Mr. F. B. McKune has resigned his position as superintendent of the open hearth plant of the Republic Iron and Steel Company, at Minneapolis, Minn., and has accepted a position with the Hamilton Steel and Iron Company, Hamilton, Ont., as superintendent of the open hearth and blooming mill.

Mr. Edw. H. Coxe, superintendent and engineer of the Boomer Coal and Coke Company, of Boomer, W. Va., has resigned his position, effective November 30th, to accept a similar position with the Jones & Adams Company, of Chicago, Ill., operating the Empire Mine, at Springfield,

Ill., and the Catlin Mine at Catlin, Ill. He will reside at Springfield.

Mr. Michitaro Oshima, of Tokio, Japan, director of the new Imperial steel works under construction by the Japanese Government, has been in Pittsburg, Pa., accompanied by his assistant, Mr. B. Katsuma. His object this time is to make some purchases of coal mining machinery for his government, to be used in mines that are to supply the fuel for the new steel plant. Mr. Oshima says that the Imperial steel plant is nearing completion, and that 2 blast furnaces will be put in operation by December.

## OBITUARY.

Michael Carey died at Halley, Idaho, on October 28th. He was born in Ireland December 12th, 1844, and was the youngest of a family of seven children that came to this country in 1850, the parents settling in Keweenaw County, Mich. At the age of 16 young Carey went to work in the copper mines. In 1864 he went to California, and mined in Mariposa 6 years. In 1870 he went to Owyhee County, Idaho, where he managed mines and mills. In 1878 he took the management of the Virtue Mine, at Baker City, Ore., which he retained until 1881, when he leased the Elkhorn near Ketchum. Later he managed the Erwin and Ontario groups, on Warm Springs Creek, of which he became sole owner.

## SOCIETIES AND TECHNICAL SCHOOLS.

Rossland School of Mines.—The Provincial Government having appropriated \$2,000 for the School of Mines, the school is to be immediately reorganized for the winter term.

Princeton University.—The enrollment of undergraduates at Princeton University shows a total gain of 120 compared with the figures of last year. There are 745 academic students, an increase of 59, and 421 in the scientific department, a gain of 58. Seven men are registered in the electrical school, against 4 last year.

Montana Society of Engineers.—A regular meeting of the Society was held in its rooms on October 13th, with 10 members and 2 visitors present. After a short business session, Mr. E. C. Sickles, of Anaconda, read an interesting paper on the "Compression of Air," following which came a discussion, Messrs. Christian, Harper, Page and Blackford taking a part.

Harvard University.—The registration is as follows: In the college, senior class, 391; junior class, 379; sophomore, 539; freshman, 537; special students, 149; total in college, 1,995, a gain of 99 over last year; the scientific school, 506, a gain of 12; graduate school, 327, a gain of 12; total for all departments, including law and medical schools, for the academic year 1900, 4,234; total gain, 167.

## INDUSTRIAL NOTES.

The Riter-Conley Manufacturing Company, of Pittsburg, Pa., has been asked for quotations on a portion of some of the bridges to be erected in South Africa.

The Bethlehem Steel Company, of South Bethlehem, Pa., states that it has appointed the Abner Doble Company, of San Francisco, its agent on the Pacific Coast.

The Northern Pacific Railroad Company will build new shops at Brainerd, Minn., the steel work of which will be furnished by the American Bridge Company.

The Baldwin Locomotive Works, of Philadelphia, Pa., has unfinished orders on its books for 57 engines for export. These include 10 for South Africa, 22 for New Zealand, 10 for the Paris, Lyons & Mediterranean Railway and 15 for Egypt.

Several changes have been made in the Henry R. Worthington end of the International Steam Pump Company. A. J. Cauldwell, who for 20 years was general manager of the Worthington Hydraulic Works, is now in the employ of the Crane Company of Chicago, as is Edward Prince, the superintendent of the Worthington Foundry.

The Edward P. Allis Company, of Milwaukee, Wis., has taken, through its Denver office, an order for a 775-H. P. direct-connected Reynolds-Corliss engine for the Colorado Fuel and Iron Company's steel plant at Pueblo. This engine will be used to drive a 500-K. W. generator. The firm has also recently sent to a mine at Sumpter, Ore., a complete 4-drill compressor plant.

The Danville Bessemer Company, Danville, Pa., has sold a portion of its plant, consisting of the converting and blooming department, plate, angle and rail mills, to the Consolidated Superior Company, who will remove it to Sault Ste. Marie, Ontario, where it will be used in equipping a new plant and for the manufacture

of construction material and shapes for the general Canadian market.

The Carnegie Steel Company's new bridge across the Monongahela River, connecting the Homestead steel works and the Carrie blast furnaces, is completed. The bridge is the largest that spans the Monongahela River, and will be used as a hot metal route. The main span is 500 ft. long and weighs 2,500 tons. The shorter span is 252 ft., and the total weight of the structure is over 9,000 tons.

J. Geo. Leyner, of Denver, Colo., recently shipped machinery as follows: Compressor and drills to the Compania Minería San Martín at Oaxaca, Mex.; to the Mammoth Gold Mining Company in the Slate Creek District, Wash., and to N. A. Baker, at South Pass, Wyo. Also another lot of drills to Placerville, Colo., for the La Salle Copper Company, and a 15 drill compressor and the 15 drills to the Dahlonga Gold Mining Company, of Ga.

The Tidewater Steel Company received recently a contract for 1,500 tons of steel plates from the New York Shipbuilding Company, of Camden, N. J. The plates are for ships of the American-Hawaiian line. The New York Shipbuilding Company is rapidly completing the plant in South Camden on the Delaware, and planning the construction of 3 ocean steamships. It already furnishes employment to 1,200 hands and it is expected that 5,000 will be employed when the plant is completed.

The Nordberg Manufacturing Company has secured a new factory site and will begin an immense plant that will cost \$500,000. The site consists of 13 acres in the town of Lake, ½ mile from the Milwaukee city limits. It has a 900-ft. frontage on the Milwaukee Railroad. A machine shop and foundry will be erected at once. The company has been buying its castings, but when the new plant is complete it will make them itself. The buildings will probably cost about \$200,000, and the machinery and equipment will cost much more. The Nordberg Company has in process of construction a huge engine for the Illinois Steel Company of South Chicago.

The Merrill's Mill Company, of San Francisco, recently shipped to the Red Chief Mining Company, of Red Bluff, Mont., one of its No. 2 roller mills, concentrators, improved rock breaker for fine crushing, and other appurtenances; also to the Jersey Blue Milling and Gold Mining Company at Ohio City, Colo., a No. 2 roller mill and one improved roll rock breakers; to the O Be Joyful Mine, Inyo County, Cal., a No. 3 roller mill. This mill displaces another roller mill that has been working on the mine. The Merrill Company lately shipped to the Century Mining Company, Terrace, Utah, an improved rapid crushing 3-stamp mill; to the Alamance Mining Company, S. K. Bradford, manager, Elk City, Idaho, a rapid crushing 3-stamp mill; also 2 rapid crushing 3-stamp mills, 1,200-lbs. stamps and outfit, to the Tuba Mine, Inyo County, Cal.

The Westinghouse Electric and Manufacturing Company, of Pittsburg, Pa., is completing the electrical apparatus for the Massena plant of the St. Lawrence Power Company on the Long Sault Rapids, which will be the largest of its kind in the world. Machines to generate 75,000 H. P. have been made. During the last 5 years 10 5,000-H. P. Westinghouse generators, making a total of 50,000 H. P., have been installed at Niagara Falls. The station at Massena will contain 15 5,000-H. P. generators. The power house will be 700 ft. long and 150 wide. Turbines will be placed on horizontal shafts in sets of 3 each, a departure from the method at Niagara, where they are mounted on vertical shafts. The latter shafts are 150 ft. long, while those at Massena will be but 80 ft. Two turbines of each set will be sufficient to operate one of the big generators, allowing any one of the 3 to be cut out without interfering with the work of the other two. Each of the main generators will weigh 175 tons, stand 22 ft. above foundations and cover a floor space of 22 by 18 ft.

## TRADE CATALOGUES.

The Henry S. Mould Company, of Pittsburg, Pa., is sending out a series of diagrams and circulars illustrating the White briquetting press. These presses are for making briquettes of coal, iron ore or flue dust and employ slaked lime as a binder. The presses are made in 3 sizes, the smallest having a capacity of 33 tons per 10 hours and the largest a capacity of 100 tons.

J. E. Rhodes & Sons, of Philadelphia, Pa., publish a 100-page pamphlet describing their belting and rubber goods. The company states that it is prepared to build driving belts up to 72 in. The company manufactures leather rubber and cotton belts, also belt lacings and hooks. They also make a full line of rubber goods, including rubber and rubber-lined linen and cot-



ton hose, also gaskets, washers and sheet packing.

The Jeffrey patented retarding coal conveyor for lowering run-of-mine coal without breakage is shown in an illustrated circular sent out by the Jeffrey Manufacturing Company, of Columbus, O. This device is in use at a number of coal mines along Southern rivers and was described in the "Engineering and Mining Journal."

The Goulds Manufacturing Company, of Seneca Falls, N. Y., has published Catalogue A, a book of 344 pages, describing the company's pumps and hydraulic machinery. The company manufactures pumps for domestic use, for agricultural purposes, for deep wells, for irrigation works, for contractors' use and for industrial purposes generally. The company also manufactures hydraulic rams, rotary and centrifugal pumps and triplex power pumps for mines or mills. Besides pumps the catalogue contains price lists of such hydraulic fixtures as hydrants, pipe and pipe fittings, gauges, valves, hose and pipe fitters' tools. The catalogue, in addition to the many hundreds of illustrations, contains useful tables on the capacity of pumps, flow of water in pipes, etc.

Roy Hopping, mineralogist of New York City, has issued his fall catalogue. He calls especial attention to his collection of aragonite, pisolite and orthoclase crystals from Karlsbad, hyalite opal from Bohemia, kidney ore hematite; also calcite and satin spar from England, quartz geodes from Iowa, sadolite from Canada and zinc minerals from New Jersey. Mr. Hopping states that his prices for foreign minerals are lower than those asked by German dealers.

#### MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" 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 of any kind, and shall be pleased to furnish them information, catalogues, etc.

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, and have no pecuniary interest in buying and selling goods of any kind.

#### GENERAL MINING NEWS.

Oil Production.—No new gushers were located in October, so new production shows a falling off compared with September, says the Oil City "Derrick." The Copley strike on Sand Fork, in Lewis County, West Virginia, was holding up at about 100 bbls. an hour at the close of the month. That a field of considerable dimensions has been discovered is generally regarded as a certainty. The Copley well was drilled in the sand on September 22d, and within 6 weeks' time has produced and tanked over 100,000 bbls. of oil.

In the fields producing Pennsylvania and Trenton Rock oils 1,261 wells were completed in October; there were 242 dry holes and the new production was estimated at 20,114 bbls. This was a decline of 26 wells completed and 5,339 bbls. new production, with a gain of 20 in the number of dry holes. There were 1,287 wells completed in the Pennsylvania and Trenton rock oil-fields during September; 222 were destitute of oil in paying quantities and the new production was 25,453 bbls. The count of new operations for all fields at the close of October gave a total of 597 rigs and 1,094 wells drilling. A gain of 43 rigs is accompanied by a loss of 94 wells drilling, which makes a net decline of 51 from September.

#### ALASKA.

##### Cape Nome.

Mining Conditions.—Brigadier-General George M. Randall, commanding the Department of Alaska, in his annual report says that at Nome last spring he found things upon his arrival at a critical stage. It was difficult to obtain convictions by jury trial in the United States Commissioner's Court, which emboldened the lawless. Labor organizations prevented men from working for less than \$1 an hour and were the cause of much destitution and want and destruction of property. Fully 18,000 people arrived in June. Nearly everyone seemed to think he had a divine right to take possession of a claim or town lot wherever found. Many property owners were disposed to defend their rights by taking the law in their own hands. The arrival of troops prevented bloodshed and serious disorder. On the request of the Chamber of Commerce the military took charge, thoroughly examined into all complaints, and where the rights of property could be determined placed it in the possession of the lawful owner. Captain W. A. Bethel acted as Judge Advocate in these cases. The sanitary conditions were placed under the charge of Major Charles E. Eber. There were about 500 men working on the beach at Nome with ma-

chinery at one time, and many declined to give answers concerning the prospects for gold, while others admitted they were taking out only from \$4 to \$6 a day. The tundra is believed to be rich, but it would require large capital to produce results. There is a large area of country which had not been prospected where gold can yet be found, but it requires men of experience to develop it. General Randall discusses the various points where mining operations have been in progress, which have come to the knowledge of the public in reports from Alaska. He recommends the purchase of 2 stern-wheel river steamers for operation on the Yukon. Also that a cable be laid from Seattle via Juneau and Skagway to Valdez, connecting with the telegraph line now building over the all-American route from Valdez to Port Egbert and down the Yukon River to Fort Michael.

In speaking of the natives, General Randall says: "In many parts of the United States provision has been made for the Indian. In Alaska it was not necessary heretofore to do much, but the great rush of white men that followed the discoveries of gold has completely changed everything. The game and fur-bearing animals have about disappeared and the natives' means of sustenance are gone. I therefore recommend that the Government afford some relief to the natives."

A San Francisco despatch states that Alexander McKenzie, the ousted receiver of many mining properties in litigation before Judge Noyes, appeared in the Circuit Court of Appeals November 7th on a charge of contempt of court.

Judge Gilbert announced that the court would admit the defendant to bail in cases that had not been appealed to the United States Supreme Court. The Court of Appeals, however, could not act in the case of Robert Chipps, which was before the Supreme Court of the United States, and in which a stay of proceedings had been granted. Bail was made \$500 in one case, and McKenzie was released upon his own recognizance in the others in the custody of the marshal until an appeal that he be released on bail can be made to the other court.

It is charged that the entire capital of the Alaska Gold Mining Company of Arizona was represented by McKenzie's influence with Judge Noyes. The company was capitalized for \$15,000,000. The complaint is that it had no mine, no claim, no prospect, but was ready to buy up titles of jumpers and squatters and to harry rightful owners into paying blackmail.

##### Douglas Island.

Alaska Treadwell.—The September report shows that from a run of 300 stamps for 29½ days 38,491 tons rocks were crushed, yielding \$51,660, and 661 tons sulphuretes were secured, valued at \$19,197. The bullion product for the month was \$76,006, showing that the ore averaged \$1.97 per ton. The expenses for the month, in round numbers, were \$31,000.

#### ARIZONA.

##### Pima County.

Helvetia Copper Company.—Between 200 and 250 men are now at work on 3 claims of the company. The product of the mine in September, it is said, was 100 tons of metallic copper, with the furnace running only 19 days. At present it is planned to keep the furnace running 15 days a month, owing to scarcity of water.

It is the intention of the company to bore for water about five miles from the camp in the underground channel of the Santa Cruz River, where it is thought water can be found by boring only 170 ft. deep. The deepest shaft now working is 300 ft. The ore changes at or about water level, from carbonates to sulphides. Some rich sulphide ore has been taken from the Old Dick claim.

##### Yavapai County.

Arizona Eastern & Montana Company.—The county sheriff has advertised the sale of this company's property, including the Lone Pine and 8 other claims, on November 10th. The sale is to cover a judgment for \$1,305, obtained against the company by Joseph Mayer. This is the company promoted by R. C. Flower and the notorious H. B. Clifford.

United Verde.—Much of the damage caused by the recent cave is repaired, and several furnaces at the smelter are in blast. The foundry and machine shops will be rebuilt on firmer ground on the hillside. The main shaft was not damaged at all.

Verde Queen.—The new 40-ton smelter at this mine at Jerome is reported in operation. At present it will only run about 15 days each month. Forty-five men are employed at the mine and smelter. J. A. King is superintendent.

#### CALIFORNIA.

##### Amador County.

(From Our Special Correspondent.)

Oneida.—C. C. Derby, ex-superintendent of the New Almaden Quicksilver mines, has been appointed to succeed John Truscott as superintendent of this mine.

##### Nevada County.

(From Our Special Correspondent.)

Good Hope.—Richard Vincent, who holds the bond on this property, near the Cabbage Patch, is making arrangements to erect a mill.

Old Banner.—This mine has been pumped out and work has been resumed on the ledge at the bottom of the shaft.

Providence Mining Company.—The newly elected officers of this company are A. Walrath, president; Dr. E. F. Leibrick, secretary; Joseph Buttenbach, treasurer, and Peter Tautphaus, superintendent. The property, located 1 mile west from Nevada City, is being actively developed.

Stiles.—At this mine in Nevada City, J. C. Campbell is in charge and a pipe line has been laid from Summit Mine to furnish water for power.

Tilley.—A 2-ft. ledge rich in gold was recently struck at this mine on Deer Creek, below Piety Hill. The owners are preparing to erect a new mill and hoisting works.

##### Placer County.

(From Our Special Correspondent.)

Gold Blossom.—This property, on Crater Hill, 4 miles west from Auburn, has changed hands and the new owners are preparing to resume operations. A large lot of pipe is on the way to the mine.

##### Riverside County.

(From Our Special Correspondent.)

Iron Chief.—A large ledge carrying \$15 in gold is reported to have been found on this property in Eagle Mountains.

##### Shasta County.

(From Our Special Correspondent.)

Bully Hill.—The erection of the smelter and refinery on this property is progressing rapidly. Four buildings, boiler house, engine room, machine shops and silica building are now completed and partly fitted up. Three large boilers, and all the machinery of the machine shops are in place, and two large engines and a power pump are being installed in the engine room. The entire smelting plant, with a capacity of 150 tons per day, should be ready for operation on the first of January next. The converter for the refining will be a feature. One mile of railway between the smelter and the mines will be completed in a few days.

Mountain Copper Company.—The strike continues. The boarding house at Iron Mountain has been closed, and the strike now promises to be long drawn out. The miners demand a reduction of the time schedule from 10 to 8 hours for all underground men. Three hundred and fifty men, including miners, muckers, timbermen and machine operators, have signed the strike roll. The schedule of wages has been as follows: Muckers, \$2.50; miners, \$2.75; machine men, \$2.85; timbermen, \$3; and carpenters, \$3.25.

##### Siskiyou County.

(From Our Special Correspondent.)

An extensive quartz ledge, which prospects well, has been discovered at the headwaters of Applegate Creek, on Siskiyou Mountain, near the Oregon line.

Blue Jay.—At this mine in the Hungry Creek District, near Coles, the new 10-stamp mill has been started up on good rock.

##### Sierra County.

(From Our Special Correspondent.)

Osceola.—The tunnel at this mine, near Alleghany, is in 360 ft. The ore is said to be very rich. Arrangements are being made to erect a 30-stamp mill. At the Plumbago Mine on the same ledge 20 additional stamps are to be added to the 10-stamp plant.

Ruby.—In this mine an ore body has been struck which promises well. The discovery was made while sinking on a ledge that was found in the old gravel channel in 1884. The rock is said to be high grade. W. Wolf is superintendent.

Williette.—A force of men are engaged repairing the old mill, and Superintendent James Gleason will start operations by running a lot of ore from the dump. There is said to be considerable good ore in sight in the old workings.

##### Trinity County.

(From Our Special Correspondent.)

Union Consolidated Gold Mines Company.—This company has been incorporated with a capital stock of \$50,000, for the purpose of developing several mines on Hickory Creek, which include the Bonanza King and Forest Queen, and other claims on Union Creek, the whole comprising some 560 acres. A force of men will prepare for vigorous operations in the spring.

##### Tuolumne County.

(From Our Special Correspondent.)

Hope.—At this mine on the Bonanza Lead, ½ miles east from Sonora, the new machinery will soon be in place. Development work continues steadily and a large amount of ore is on the dump. The Oom Paul adjoining is also being worked.

**Little Beauty.**—Four men at this mine at Arastraville cleaned up \$1,400 in 30 days.

**Rawhide & App.**—Another extension has been granted on the bond of these mines to January 1st. The 20-stamp mill on the App has started up, and the new addition of 60 stamps is under good headway.

#### COLORADO.

##### Clear Creek County.

(From Our Special Correspondent.)

**American Gold Mining Company.**—A new shaft house is being erected and new machinery added at the Black Eagle Mine, owned by this company. Connection was made with the Bismarck workings some time ago.

**Commonwealth Mining Company.**—It is reported that a syndicate has secured control of the Mattie Mine at Idaho Springs and will do some heavy development. The mine has a record of over \$1,000,000. The shaft is being pumped out and the machinery is to be overhauled.

**East and West Gold Mining Company.**—The Chicago Belle Mine near Dumont has been acquired and development is under way. The upper levels are being driven by contract. In the east the streak is 1 to 3 ft. wide. Some copper and lead with gold and silver values are found.

**John Owen Mining and Milling Company.**—The Washington, Freighter's Friend and Amy C. properties worked by this company under lease and option have finally been acquired, the final payment being made to the various interests early this month. The total purchase price was \$80,000. The company is composed of Boston and Buffalo capital. Sinking to connect with the Newhouse Tunnel is under way. The shaft at 500 ft. shows 5 ft. of good mineral.

**Kokomo Company.**—This company is operating the Pioneer Mine and Mill at Dumont and also the Kokomo Mine in Gilpin County. A gasoline hoist has just been put in at the Pioneer and sinking is under way. The ore streak is about 1 ft. wide and will pay to treat at the company's mill.

**Mendota.**—This property at Silver Plume, belonging to R. O. Olds, has been sold to a Chicago company for a consideration reported at \$250,000. The property is one of the prominent silver-lead mines of the county.

**Tropic Mining Company.**—Jay Morton and his son, R. B. Morton, the Chicago millionaires, are at the head of this mining undertaking. They own a number of properties on Seaton Mountain at Idaho Springs and are now driving a cross-cut tunnel to open the various lodes with depth. An air-compressor of the Norwalk style was installed last month. Distance to Tropic vein is 800 ft.

##### Gilpin County.

(From Our Special Correspondent.)

**Mining Deeds and Transfers.**—K. Roberts to W. G. Hills,  $\frac{1}{2}$  interest in 300 ft. west of Smith Lode; J. A. Elsaser to G. Pile,  $\frac{1}{6}$  interest in Last Dollar and Mary Ann; J. Fleiss et al. to Cleveland Deep Tunnel Mining Company, lease and bond 5 years on Cleveland, New York and Madamasell lodes; J. H. Le Moyné to H. S. Waldo,  $\frac{1}{4}$  interest in Waltham; F. W. Kroenke to The Metal Miners' Corporation, assignment of lease on Gettysburg; G. P. Walford to Carr Mine and Colorado Company, Limited, the Katie Lode; W. M. Brewster and Theophilus King to The Boston & Denver Mining and Milling Company, 37 lode claims, 2 mill sites, the Black Hawk 75-stamp mill, and real estate in Central City and Black Hawk; North American Gold Mining and Development Company to Bertha Gold Mining and Milling Company, the Douglas lode in Boulder County, the lease upon main workings of Rigi group at Cripple Creek and the Pay Rock Mine in this county.

**Ore Shipments.**—During the month of October the shipments of smelting and crude ore, concentrates and tailings to Denver and other points of treatment were 344 cars, or 6,365 tons, showing the heaviest month's shipments of the year.

**Freedom.**—Sinking has been commenced with 3 drifts and a lift of 100 ft. or 200 ft. may be sunk. With this lift opened up it is believed that the mine will be opened up bigger than ever.

**Gettysburg.**—This property is to be started up by the Metal Miners' Corporation, under lease and bond.

**Gunnell Gold Mining and Milling Company.**—A 6-H. P. gasoline Fairbanks & Morse engine has been received and it will be installed at the 1,100-ft. level for the purpose of sinking the shaft. F. C. Young, Central City, is manager.

**Kansas Burroughs Consolidated Mining Company.**—The new engine for the Phoenix-Burroughs is being installed and a new addition has been built. P. McCann, Central City, is manager.

**Running Lode.**—Good ore is being opened in the 6th and 7th levels, and the Gowers Mines Syndicate are going to sink the shaft. Five stamps are dropping on milling ore and a lot of 15 tons of ore was made to Idaho Springs con-

centrators this week, besides shipments of about 55 tons of lead ore carrying values of over \$100 per ton, which goes to the Denver smelter. This mine promises to be among the best in the county. T. Dunston, Black Hawk, is superintendent.

**Sub-Treasury.**—A company is to be formed for operating this property situated in Lake and Russell mining districts.

**Two-Forty.**—Outside parties have been dickering for this property, but the owners have refused the offer; 3 car-loads, or about 60 tons, of smelting ore were shipped to smelters this week. Fred Belcher, Central City, is manager, as well as part owner.

**Wautauga.**—Working force numbers 40 men and daily shipments of concentrating ore average 40 tons, which is treated at Idaho Springs. A car of iron was shipped to Denver this week. The working force is to be increased. J. Clayton, Idaho Springs, is manager.

##### Lake County—Leadville.

(From Our Special Correspondent.)

**A. M. W. Mill.**—This new concentrating mill to handle the zinciferous deposits is proving very successful, treating about 100 tons per day.

**Bison.**—The new lessees have found a great deal of water, but it is handled satisfactorily and shipments will soon be started from the iron ore exposed.

**Coronado Mining Company.**—Work of sinking 75 ft. from the present 600-ft. level begins this week and at that depth the shaft will encounter the high-grade iron body already tapped by diamond drill.

**Columbia.**—Lessees are retimbering the old workings preparatory to shipping from the iron bodies already opened.

**Crown Point.**—Lessees on the Hall Shaft have a good iron body opened up and are shipping 20 tons a day.

**Home Extension.**—This company has its new shaft down about 400 ft. and anticipates cutting the contact almost any day.

**Home Mining Company.**—Two hundred and fifty tons per day are shipped. A great saving is to be made by the introduction of gas for fuel.

**Midas.**—The enormous iron ore shoot in this mine continues to open up and shipments have been increased to 200 tons per day. This shoot has proven one of the greatest ever opened in the district.

**Northern.**—The company has leased this property to a local syndicate that is shipping about 15 tons a day of high-grade argentiferous iron. The iron is about 56%, including manganese and has good values in silver.

**Nubian Mining Company.**—The P. O. S. claim is now opening the ore body struck several months ago. Shipments of high-grade ore have started and will be steady.

**Rialto Leasing and Mining Company.**—The enormous pump at the 1,000-ft. level is being put in. New York owners are here looking over the ground.

**Stars Combination.**—On the New Evening Star shaft lessees have opened up a 2-ft. streak of lead sand. In addition 25 tons per day are shipped from a good iron body.

**Tarshish Mining Company.**—A small amount of hard carbonate ore is being shipped. Sufficient development has not yet been done to state the size of the ore body.

**Triumph.**—A reader desires to know the value of the old Triumph Leasing Company stock. This is worthless, as the old lease expired long ago and no results were attained through previous operations. The property is now worked by Geo. F. Campion.

**Yankee Doodle.**—The recent strike of argentiferous iron ore has developed into a body 40 ft. thick. A part of this carries 12 oz. silver and the remainder is high in manganese.

##### Park County.

**Beaver Placer Company.**—This company has spent the summer in experimental work. Three shafts were sunk. The placer will be worked next season. No dredges are used, the working being by hydraulic washing.

**Cincinnati Syndicate.**—This Cincinnati, O., company, operating large placer works near Fairplay, recently completed the annual clean-up from the summer's washing. Already plans for next year's work are under way. The placers are situated at the headwaters of the Platte River. During the summer an extensive system of flumes and a complete plant of machinery have been installed. This preliminary work occupied a great part of the season.

**Hilda Mining Company.**—This company, a Sheedy & Kountze concern, is taking out good ore from the Last Chance Mine.

Teller County—Cripple Creek.

(From Our Special Correspondent.)

**Acacia Gold Mining Company.**—George Wrockloff has bought out the Robinson lease on the Burns claim. Mr. Wrockloff has been shipping a great deal of rich ore from a lease adjoining

the one just purchased, and which, it is thought, contains a continuation of the same ore body.

**Elkton.**—This mine will be closed down temporarily to allow putting in the new gallows frame. It is thought that about a week will be required to complete the work. Hoisting will be through the Tornado until the work over the main shaft is completed. There is still quite a heavy flow of water, which the pumps handle easily.

**Independence.**—The men have returned to work and are required to undress to their underclothing and pass the watchman before dressing for the street. Any man suspected of having stolen ore on his person is searched by one of his fellows in the presence of the watchman.

**Lillie Consolidated Gold Mining Company, Limited.**—The 1,225-ft. shaft is to be sunk 300 ft. deeper, making it the deepest shaft in the district. This is one of the heavy producers and owned largely by English capital; it is situated on Bull Hill near the Vindicator, and is one of the best equipped properties in the district.

**Ophelia Tunnel.**—An important strike is reported, supposed to be near the Anaconda property.

**Pinnacle Gold Mining Company.**—The directors have granted to Charles J. Moore, of Cripple Creek, a lease on a portion of the Mitchell Claim. The lease calls for 25% royalties and 10 ft. of sinking per month, employing 75 shifts.

**Zenobia Gold Mining Company.**—A permanent injunction has been granted the minority stockholders restraining the majority from selling the Zenobia Claim for \$100,000. W. S. Stratton was reported as the prospective purchaser.

#### IDAHO.

##### Idaho County.

**Blue Dragon.**—This mine at Elk City is being equipped with a new 10-stamp mill now about completed.

##### Owyhee County.

**California.**—This property, which adjoins the Great Republic, is under bond to F. R. Reed, who is to begin work on it soon.

**Cumberland.**—This property, almost at the summit of War Eagle Mountain, is worked by a Canadian company, with R. H. Britt as manager. Four machine drills are running underground; the mill has been idle owing to poor water supply.

**De Lamar Mining Company.**—The September report of Manager D. B. Huntley shows 4,027 tons ore and 4,970 tons of tailings were treated during the month. The ore assayed \$10.61 in gold and silver before treatment and \$2.47 after treatment. The tailings assayed \$5.72 before treatment and \$1.50 after treatment. The cost of treating the tailings was \$8.151. The total estimated income is \$62,723. The expenses were \$41,080, leaving a profit of \$21,643.

**Great Republic.**—This property near Silver City is under bond to Joseph Hutchinson, superintendent of the Trade Dollar Company. K. H. McCloud has charge and employs 3 8-hour shifts. The ore runs in silver and gold.

**War Eagle Mining Company.**—This company is driving the Sinker Tunnel near Silver City. This tunnel is 7 by 7 ft., with a 24-in. gauge track laid with 20-lb. rails. Two Rand drills are in use at the face, and ventilation is secured through a 14-in. pipe by means of a No. 2 pressure blower. About 80 tons of rock are handled daily by mule trains, each train comprising 6 Truax cars of 16 cu. ft. capacity. The tunnel is advancing  $8\frac{1}{2}$  ft. daily and is now in 2,420 ft.; when completed the full 6,300 ft. its face will be directly under the collar of the old Golden Chariot shaft, with a vertical depth of 2,400 ft. A new power-drying house is in use, around the sides of which are shelves on which the powder is laid, and just beneath these a series of hot water pipes heated by the exhaust steam from the fan. The tunnel will tap the Oro Fino-Golden Chariot-Elmore-Mahogany vein. Frederic Irwin is superintendent.

##### Shoshone County.

**Blue Grouse Mining Company.**—This company, with stockholders in Genesee, Lewiston and Spokane and headquarters at Moscow, is working the Blue Grouse Group on Sunset Peak. The original owners of the group were not concerned in the formation of the company, the promoters taking it on a bond of \$20,000, the last payment on which was made over a year ago. Ore had been found by the original locators by stripping the vein for 400 ft. up the mountainside. A tunnel run for several hundred feet shows ore all the time, and the point below where it was first found on the surface has been reached. Another level, 211 ft. lower, has been run cross-cut most of the way. The drifting has shown conditions similar to those above.

**Chloride Queen.**—In group of 3 claims near Sunset Peak a tunnel has been run 700 ft., but no work is being done now.

**Father Lode.**—Montreal men did considerable work on this Sunset Peak claim under bond early in the year. It is now idle. The property is owned by the Father Lode Mining Company.

Great Eastern Mining Company.—This company, under the management of J. Haley and M. Baumgartner, is about to start work on the Great Eastern group of 6 claims near Gem. The location is on Canyon Creek, between the Standard and Frisco mines and on the opposite side of the Standard. The development work consists of a crosscut tunnel 600 ft. in length, with the west drift in 100 ft. and the east drift 300 ft., showing a fair grade of galena ore. The vein in the drifts has about an average width of 4 ft. There is a parallel vein about 300 ft. north, with a small amount of development work. The company is incorporated for 1,000,000 \$1 shares, of which 400,000 have been placed in the treasury for development purposes.

White Cross Mining Company.—This company is developing a group of claims 6 miles from Moscow. The ledge opened is reported to be from 14 in. to 5 ft. wide and to carry values from \$4 up. The principal value is gold. R. L. Johnson is president of the company.

## INDIANA.

Oil Production.—State Geologist Blatchley, who has just returned from a trip over the oil and gas fields of the State, says that the oil field is rapidly spreading; the output of oil will succeed that of gas, and that the oil field will become co-extensive with the gas field. The field is extending westward through Wabash and Miami counties and southward toward Indianapolis. Mr. Blatchley says Indiana has produced in 10 years 28,000,000 bbls. of crude oil, which brought \$18,000,000 into the State, to say nothing of the vast sums of outside capital attracted to Indiana in drilling operations. He thinks this production will be largely exceeded in the next 10 years.

## MICHIGAN.

## Copper—Houghton County.

Baltic.—The October output was 128 tons of mineral. The same as for September. The Wisconsin Bridge and Iron Works has taken the contract to furnish a steel self-supporting stack, 7 ft. in diameter and 140 ft. high. The Milwaukee concern also furnishes the roof trusses for the new compressor house. The walls are up for a compressor house. The steel trusses for the roof will be placed in a very short time. The concrete foundations for a boiler house are well under way. Concrete mixers similar to those in use at the Redridge dam are used. The rock for this concrete work is transported from the Atlantic Mine. The sand is being taken from the Atlantic Mill.

Calumet & Hecla.—The Red Jacket shaft now furnishes 65 cars of rock daily. No. 2 shaft, which was burned last May, is fully repaired to the 15th level. Five more levels remain to be repaired, and the shaft will scarcely go into commission before January.

Tamarack.—No. 5 shaft has less than 90 ft. to go to strike the Calumet & Hecla. Work has been in progress over 5 years, and the shaft will be the deepest shaft in the copper country, if not in the world. It is now down nearly 4,700 ft. The shaft is divided into 5 compartments, 4 for hoisting rock and men and lowering timber, tools and supplies, and 1 for the air pipes, pumps, ladders, etc. The size of the shaft inside the timbers is 27 ft. by 7 ft. 2 in. In 1895 and 1896, when the work was first started, there was considerable trouble experienced and for the first 400 ft. progress was slow, owing to the excessive inflow of water.

Wolverine.—The October product was 231 tons of mineral.

(From Our Special Correspondent.)

Atlantic.—The product of this mine for October was 302 tons mineral. This was the largest for any month in the history of the mine.

Tamarack.—Many improvements are under way at the North Tamarack location. No. 3 shaft is down 4,920 ft. This is a 3-compartment shaft and it is supplying about 600 tons of rock per day. Not very much work is being done at No. 4 shaft.

No. 5 shaft has about 90 ft. to go before it reaches the lode. If the sinking is continued at the present rate it will reach the lode about January 1st.

Quincy.—A compressor and boiler plant, consisting of 2 Rand compressors, of 60 drills each, and 4 Wickes' tube boilers, has gone into commission at No. 2.

## Copper—Ontonagon County.

The 3 shafts numbered 1, 2 and 3 on the Knowlton lode are looking well and sinking is being actively carried on in 1 and 2, 16 drills being at work. About 150 men are now employed. From shafts 1 and 2 on the Knowlton the Butler lode, which runs parallel to the Knowlton, has been reached by cross-cuts and a considerable amount of drifting has already been accomplished. From No. 3 shaft a considerable amount of copper is being raised, at the present mostly mass and barrel work. The surface plant is about completed for the time being. Three substantial shaft houses have been erected, a 20-drill compressor installed and ample engine room

facilities provided. In addition there are a machine shop and office quarters.

## Iron—Menominee Range.

De Soto.—This company is sinking one of the deepest shafts of the lake region at the Mansfield Mine at Mansfield. It will be 6 by 16 ft. and 1,000 ft. deep, and will be equipped for heavy and rapid work. The mine is one of the few Bessemer mines of the Crystal Falls district. The ore deposits are reported showing better with development, and the mine has an excellent future.

## MISSOURI.

## Jasper County.

(From Our Special Correspondent.)

Joplin Ore Market.—The zinc ore market was strong last week, with a good demand. Ore advanced 50c. per ton from last week's prices, but buyers were unable to get the very best grades for \$29 per ton and paid \$28.50 for ore slightly under the top. A large amount of jack was purchased at this figure in Joplin and various other camps and \$28 per ton was a common price for fairly good ore. The Three Friends ore at Belleville sold for \$29 per ton, with a deduction of 2% for moisture, making the net price \$28.42, but \$29 per ton straight was refused for the King Jack ore on the ground of the United Zinc Company at Joplin. Lead was steady all the week at \$23 per 1,000 lbs. Following is the turn-in by camps for the Joplin District for the week ending November 3d:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin.....	2,068,390	418,690	\$37,577
Zincite.....	389,140	10,190	5,486
Carl Junction.....	65,280	.....	84
Duenweg.....	161,250	39,470	2,402
South Jackson.....	324,810	9,350	4,113
Cave Springs.....	254,510	11,990	3,585
Galena-Empire.....	1,612,350	139,270	23,357
Central City.....	237,230	7,750	2,905
Aurora.....	987,650	20,210	10,479
Spring City.....	57,130	43,030	1,677
Spurgeon.....	134,370	20,900	1,422
Seneca.....	65,950	8,310	585
Carthage.....	399,370	.....	5,198
Granby.....	374,600	24,700	4,500
Cartersville.....	1,421,400	263,800	24,124
Oronozo.....	773,150	4,890	9,964
Webb City.....	301,900	40,220	4,558
Springfield.....	98,880	.....	1,346
Stotts City.....	44,161	.....	608
Ash Grove.....	55,880	.....	391
Alba.....	8,360	.....	92
District total.....	9,837,390	1,063,830	\$144,158
Total 44 weeks.....	410,084,520	48,415,330	\$6,900,875

During the corresponding week last year top grade zinc ore sold at \$40 per ton and lead at \$27 per 1,000 lbs. The output was less by 2,138,240 lbs. of zinc and 34,010 lbs. of lead; the value greater by \$15,209. For the corresponding 44 weeks last year, lead sales were less by 8,088,782 lbs., zinc sales greater by 20,644,180 lbs., and the value greater by \$2,621,590.

Transactions in mines and mineral lands are light and many deals are held in abeyance.

## MINNESOTA.

(From Our Special Correspondent.)

Shipments are about ended, and mines are stopping every few days. Most of the late shipments will be from lower range mines. The totals from Minnesota for the year to November 1st were 8,778,088 tons, against 7,081,004 for the same period last year. This gain of 1,700,000 tons was made in the first month or two of the season. For October shipments were as follows, by roads: Duluth, Missabe & Northern, 530,978 tons; Duluth & Iron Range, 439,375; Eastern Minnesota, 224,826. The latter road's shipments for the year to November 1st are 1,450,960 tons; for the entire year 1899 it shipped but 889,964 tons. The shipments of the Duluth, Missabe & Northern will make Duluth the largest iron ore port of the lakes this year.

## Iron—Mesabi Range.

(From Our Special Correspondent.)

Auburn Iron Company.—This company has closed shipments, with a record of 235,000 tons, considerably less than was expected. It will continue some stripping during the winter and will open into a new level, lowering the steam shovel in the pit to load for the shaft.

Colonial Mining Company.—The mines of this company will ship to the close of the season, and are now working steadily and strongly. The Roberts Mine is shipping its stockpile.

Commodore and Stevenson.—These Corrigan, McKinney & Company mines are about over for the season. Stevenson has shipped about 75,000 tons, considerably less than was looked for, and Commodore not within 125,000 tons of the 400,000 tons that it was to have sent down. They will be prepared for very extensive work another year.

Fayal Iron Company.—This company will continue to mine and ship to the close of the season.

Oliver Iron Mining Company.—This company will have 2 more drills at work near Mesaba station the coming winter on the tracts thrown up by the Minnesota Iron Company, and will thoroughly explore the ground.

Pettit.—This new property is much troubled by quicksand.

Sparta Iron Company.—This company expects to ship about 270,000 tons, from both the Sparta and Malta mines; all ore has been shipped except a small part of one grade, and the mines will stop this week. Considerable development work, both surface and underground, will be carried on during the winter if conditions are as favorable as expected.

## Iron—Vermilion Range.

(From Our Special Correspondent.)

Minnesota Iron Company.—The Minnesota and Chandler mines will continue shipments as late as the season will permit. The Minnesota Iron Company has discontinued all explorations except those at the North Star lands, and 1 or 2 others, where the indications are very favorable. It is probable that a large mine will be developed at the North Star.

## MONTANA.

## Broadwater County.

Diamond R.—Work has begun on a tramway to connect this mill at Neihart with the Broadwater Mines. The tramway is 3,500 ft. long, with a capacity of 500 tons in 10 hours. Considerable development work has been done on the vein for 1,200 ft. The ore is galena in porphyry, and the vein varies from a mere streak to wide shoots of ore. The main ore body is concentrating. R. J. Riley, of Neihart, is superintendent.

## Madison County.

French Gulch Dredging Company.—The gold dredging machine on French Gulch is reported working admirably. The dredge machinery was constructed in San Francisco. The boat is 75 ft. long by 35 ft. wide, and floats in a pond but little larger than itself. Each bucket holds 3½ cu. ft. of gravel and 14 bucketfuls are picked up in a minute. Only 4 men are required to operate the dredge. The company which operates the new dredge is an Anaconda corporation and controls 3 miles of the creek bed and banks. The percentage of loss is said to be small.

## Silver Bow County.

Parrot.—There is much activity at this mine, where several hundred mechanics and laborers are at work on the immense improvements now being made. The old Mountain Consolidated hoisting engine is in use and a full force of miners is at work getting out ore. A large hoisting plant, air compressor will soon arrive from San Francisco. A steel gallow's frame will also be erected. All the buildings will be made of steel and iron.

Smokehouse.—At this exploration in the city limits of Butte 3 men comprising the day shift were suffocated by powder gas on October 28th. The shaft is 360 ft. deep. The men fired 12 or 15 shots and returned to work before the air in the shaft had cleared.

## NEVADA.

## Esmeralda County.

(From Our Special Correspondent.)

Silver Peak Gold and Silver Mining Company.—This company, organized by New York capitalists, is reported to have purchased the Blair Mines for \$600,000, paying \$100,000 down. The purchase includes the mines, mill, mill site, wagon roads, buildings, etc.

## Storey County—Comstock Lode.

Alpha Consolidated Mining and Milling Company.—At the annual meeting 91,918 shares were represented out of a total capital stock of 105,000 shares. The old board of directors was unanimously re-elected: Charles Hirschfeld, Thomas Anderson, Thomas Cole, George C. Snider and A. F. Coffin. Charles Hirschfeld was re-elected president; Thomas Anderson, vice-president; Charles E. Elliot, secretary, and A. C. Hamilton, superintendent. The company has a cash balance of \$2,031 on hand.

## NEW MEXICO.

## Grant County.

Summit.—This claim at Cook's Peak is reported bonded to F. A. Fuller, of Albuquerque, and others, for \$150,000. The ore is sand carbonate, and is said to carry 60% lead and 140 oz. silver to the ton.

## Pinal County.

Milwaukee & Arizona Prospecting and Mining Company.—This company is developing claims on Mineral Creek near Ray. Henry Parry, the company's superintendent, has taken an option on the Sunset and Bennett-Dolly groups near Casa Grande.

## SOUTH DAKOTA.

## Custer County.

(From Our Special Correspondent.)

Mica.—F. C. Graydon, of the Chicago Mica Company, has returned to Custer. He will start up a number of mica mines.

## Lawrence County.

(From Our Special Correspondent.)

Galena.—A rich streak, 18 in. wide, of galena ore has been encountered in the Bullion Mine,

in the Galena District, 11 miles east of Deadwood. The mine is owned by Dr. H. H. Muggley, of Chicago. New discovery runs from \$75 to \$400 per ton gold and silver. Dr. Muggley is in the east at present. Ore in early days was treated at the Davy Smelter at Galena.

**Golden Crown.**—The Lead owners of the Golden Crown cyanide plant in the North Lead District are enlarging it to 50 tons capacity. The ore comes from the Golden Crown Mine.

**Highland Chief.**—W. A. Wheeler, of Minnesota, and A. D. French, of Detroit, Mich., have arrived to look over the Highland Chief Mine, in Spruce Gulch, in which they are heavy owners. Ore will be hauled to the Deadwood Smelter, 1 mile distant.

**Homestake Company.**—The water ditch of Spearfish Creek will be finished by November 10th. The ditch is 10½ miles long, 10 miles being laid with 28-in. tiling and ½ mile with 30-in., all manufactured at St. Louis. The ditch tunnels 4,000 ft. through a hill, crosses a gulch of 150 ft. wide with a steel bridge 50 ft. high, and has a wagon road 15 ft. wide alongside the entire length. At one place the water is lifted over a hill by 2 Riedler pumps, each with 2,250 gal. capacity per minute. The Burlington Railway Company built a branch from Dumont 11 miles to the pumping station. The ditch required 600 car-loads of tiling and 100 car-loads of machinery. Water will be turned on about November 15th. It will be stored in the new reservoir built last year at the rear of the Ellison hoist; capacity, 1,250,000 gal. The water will be distributed to the mills, cyanide plants, and to the cities of Lead and Deadwood. The company has expended nearly \$1,000,000 on the whole work, but will have abundant water for 4 mills now in operation and the 2 old mills on the north side of the Lead hill, also the 1,200-ton cyanide plant nearly completed and another cyanide plant that is to be erected. It is estimated that the output of bullion from the mines will be increased 1/3 when the 6 mills and 2 cyanide plants are in operation. The 1,200-ton cyanide plant will save from the tailings about \$40,000 per month. It is expected that this plant will be completed by January 1st. The building is to be 345 ft. long and about 200 ft. wide. There will be 24 tanks, which will handle the output of 580 stamps, or about 2,320 tons per day. The company has nearly completed the repairs on the Caledonia and DeSmet mills. The old tunnels connecting these mines have been retimbered. The company has shipped to date 1,309 gold bricks, equal to about 365,260 lbs. of gold, or 83 tons.

**Ulster.**—Lee Hall and associates, of Portland, have encountered a rich shoot of ore on the Ulster Mine, in the Ragged Top District. The ore will probably be hauled to the Detroit & Deadwood Company's cyanide plant.

#### Pennington County.

(From Our Special Correspondent.)

**Blue Lead.**—The final payment has been made by the Maloney-Blue Lead Copper Company, R. M. Maloney, of Deadwood, president, on 240 acres of ground. A tunnel 1,400 ft. long is being run to tap the ore body.

**Detroit.**—This property, northwest of Keystone, has been bonded to Ohio capitalists for \$30,000. The mine is owned by Frank Lockhart and associates, of Rapid City.

#### UTAH.

(From Our Special Correspondent.)

**Bullion and Ore Shipments.**—During the week of November 2d there were sent forward from the different smelteries 21 cars, or 886,544 lbs., lead-silver bullion; 5 cars, or 266,152 lbs., copper bullion. In the same week there were shipped from several camps 85 cars, or 3,862,080 lbs., lead, silver and gold ore and concentrate products and 6 cars, or 310,000 lbs., copper ore.

**Grand Central vs. Mammoth.**—Mammoth has filed a cross complaint in this trespass suit, which, if substantiated, will take in all the Grand Central ledge. On the other hand, Grand Central has filed an additional claim for \$80,000, the alleged value of ore mined in violation of the order of the court.

#### Summit County.

(From Our Special Correspondent.)

**Anchor.**—The mill is again in full commission, with a large number of the former employees in their old places.

**Daly-West.**—Connection is made on the main ore shoot between 1,200 and 1,400-levels, exposing a fine ore face. It is said that in no month were the reserves more largely increased than in October.

**Park City Shipments.**—For the week ending November 3d there were marketed through the Mackintosh Sampler 2,572,000 lbs. of ore and concentrate products, which represent the shipments from the camp. They were made up as follows: Silver King, 1,292,000 lbs.; Daly-West, 708,000 lbs.; Ontario, 321,000 lbs.; Anchor, 175,000 lbs.; Clark, 63,000 lbs.; Barnes, 13,000 lbs.

**Valeo.**—By the middle of November the smeltery will be operating, which event is looked forward to with keen interest. Some ore of good

shipping grade has been cut in the lower tunnel.

#### Tooele County.

(From Our Special Correspondent.)

**Consolidated Mercur.**—President-Manager Hartwig A. Cohn on Friday showed Mr. John Hays Hammond something of this great property. Mr. Hammond left Salt Lake for California on November 5th. He is to return here before the end of the month, when it is said he is to make a thorough examination of the Consolidated Mercur mines.

#### VIRGINIA.

##### Wise County.

**Virginia Coal and Coke Company.**—This company, which is entirely a separate company from the Virginia Iron, Coal and Coke Company, has petitioned the Circuit Court at Bristol, Va., for an amendment to its charter changing the name of the company to the Crane's Nest Coal and Coke Company. It also seeks to transfer the principal office from Abington, Va., to Bristol. The company is now operating the Tom's Creek Mines.

#### WASHINGTON.

##### Ferry County.

(From Our Special Correspondent.)

The Belcher, Hawkeye, Midnight, Columbia and Eastern Star are the most prominent mines, and with the Jack Pot and Annie are all situated in the Lambert Creek Division of Eureka Mining District, about 12 miles northeasterly from Republic, by wagon road, and 35 miles to the Granby Smelter, at Grand Forks, B. C. A railroad between Republic and Grand Forks would run within 4 to 8 miles of those claims. There are a number of fair to good prospects being opened.

**Annie.**—An open cut has exposed a quartz vein 30 ft. wide, and a shaft is sunk 12 ft. deep below the cut on 2 separate strata of gold and silver-bearing quartz of about \$10 value per ton.

**Belcher.**—The exploration consists of a tunnel, in 180 ft., which intersected a vein 3 ft. wide at 60 ft. on which a winze was sunk 150 ft. The vein yielded ore running from \$30 to \$100 per ton in gold, silver and copper, with the principal value in copper. The tunnel, at 130 ft. in, struck the main vein, which, being cross-cut, proved to be 33 ft. wide, with values in gold, silver and copper averaging about \$10 per ton. The claim is closed, pending a car-load shipment of ore to the Granby Smelter, at Grand Forks, B. C. Supplies have been ordered for the winter's work.

**Hawkeye.**—The shaft is down 100 ft. through gauge material, with bunches of fair-grade ore. At the bottom of the shaft some good ore that will yield from 10% to 15% of copper and some silver and gold is exposed, with total values ranging from \$33 to \$64 per ton. Work is suspended while a road grade is being constructed and a horse whim installed. Supplies for 8 men have been laid in for the winter, but only 6 are employed. A combined shaft and whim house and blacksmith shop is in course of erection.

**Jack Pot.**—This claim shows croppings of quartz 40 ft. wide. Some loose surface rock is rich in copper, and some surface cross-cutting of the vein is under way to locate it in place.

##### Ferry County—Republic.

**Republic Consolidated Gold Mines.**—The new mill is in partial operation. Half of the crushing plant is crushing to a 60-mesh 75 tons a day. The average for the whole plant is expected to exceed 200 tons daily. The fires are started in 2 of the furnaces and some ore has been roasted.

#### WEST VIRGINIA.

##### Barbour County.

An explosion of gas in a mine at Berriesburg, on the morning of November 3d, wrecked the mine and killed 12 men. There were 14 men in the mine at the time of the explosion. It is the first accident in the field which is being operated by the Southern Coal and Transportation Company, and the mines have been running only a few months. The exact cause of the explosion is unknown. The superintendent asserts that it was due to an excessive charge of powder, but the miners say it was caused by fire damp. The fire damp had been noticed several days, and the attention of the mine foreman, it is said, had been called to the fact, but no attention was paid to it, apparently, and the men continued to work. The Berriesburg mines are in the Barbour field, about 6 miles above Philippi. The miners are all negroes, but the 14 men on the repair gang were white.

##### Fayette County.

(From an Occasional Correspondent.)

**Chapman Coal and Coke Company.**—This company, which recently purchased the Berry Lease at New Caperton, is making extensive improvements, having erected a new camp and having a tippie for prepared coal.

**Victoria Coal and Coke Company.**—This company, of Catasauqua, Pa., and New York, is installing a new 180-H.-P. Maxim boiler, a 16 by 24 Rand air compressor and a 12-ft. Brazil fan at the South Side Mines. It is conducting sur-

veys for new opening on same lease to increase the output to 1,200 tons per day.

#### Putnam County.

(From Our Special Correspondent.)

**Carver Bros.**, among the largest coal producers on Kanawha River, are negotiating for the sale of the Plymouth Mine. It is not known who the prospective purchaser is.

#### WISCONSIN.

##### Douglas County.

**Chippewa Copper Company.**—This Boston company, it is said, will erect a 10-stamp mill at its property south of Superior. The president is Zenos H. Jones; treasurer, F. A. Woodward.

#### FOREIGN MINING NEWS.

##### AUSTRALASIA.

###### Tasmania.

**Mount Lyell Mining Company.**—This company reports for the four weeks ending October 17th a total of 21,140 tons of ore smelted, the yield being 743 tons blister copper, containing 735 tons fine copper, 49,825 oz. silver and 1,853 oz. gold. The average result was 3.5% copper, 2.36 oz. silver and 0.08 oz. gold to the ton.

###### CANADA.

##### British Columbia—West Kootenay District.

(From Our Special Correspondent.)

**Rossland Ore Shipments.**—For the 10 months of 1900 ending October 31st the ore shipments from Rossland mines amounted to about 172,000 tons, valued at \$2,752,000 gross. For the corresponding period of 1899 the ore shipments amounted to \$141,000, valued at \$2,387,000 gross, and for the corresponding period of 1898 the shipments were 90,000 tons, valued at \$2,070,000 gross. The average value per ton in 1898 was \$23 and in 1900 about \$16.

The ore shipments from Rossland mines for the whole of 1899 amounted to 172,665 tons, valued at \$3,229,036. The increase in 1900 will therefore be the output for November and December.

The ore shipments for the other mining divisions which include milling ores, for the 10 months, are: Nelson, 50,000 tons; Slocan, 40,000; East Kootenay, 45,000; Boundary District, 40,000, making a total of 347,000 tons, valued at \$7,500,000.

**Bond Holder.**—The Hall smelter recently paid to the lessees of the Bond Holder group \$2,200 for a car-load of 17½ tons of ore. This amount was the net proceeds after deducting freight and treatment charges. The metallic contents were 218 oz. per ton of silver, 7% lead and 1% zinc. The group is situated on the divide between Ten-Mile and Springer Creeks and the controlling interest is held by Mr. R. Campbell Johnson, of Nelson.

**Tamarac.**—The mining engineer recently in charge, R. Macfarlane, has begun a suit to recover wages. Mr. Macfarlane complains of mismanagement at the head office.

**Velvet.**—The management intends to develop the 500 and 600-ft. levels before shipments. When the development work is completed about 20 tons a day will be shipped.

**White Bear.**—The new manager of this Rossland mine has taken charge and the shaft is being pumped out.

**Ymir.**—The management of this Nelson mine has an 80-stamp mill running. According to the statement of S. S. Fowler, the manager, the mill treated about 6,000 tons for September, the gross value of which was \$9.50 per ton; cost of treatment, etc., estimated at \$4; profit, \$5.50. The mine is stated to be in a good condition, with a large ore reserve.

##### Nova Scotia—Cape Breton.

**Dominion Coal Company.**—This company reports its shipments for October at 188,200 tons of coal. For the 8 months of the fiscal year from March 1st to October 31st the total shipments were 1,414,700 tons, against 1,216,306 tons in 1899 and 975,075 tons in 1898.

##### Ontario—Rainy Lake District.

(From Our Special Correspondent.)

A large strike of iron is reported east of Lake Nipigon, on Poplar River, where the ore formation is said to have been traced for a long distance. Experts have gone in and the results of their examination will be watched with interest.

**Golden Star.**—The stock of this mine has fallen from the high water mark of 80c. to about 2½c. a share, the last figure not representing the value of the machinery. The mine is closed, but an examination is to be made at once and it is hoped that a reorganization will be carried through.

##### Yukon District.

Late despatches from Dawson state that an order in council has been received from Ottawa directing that after October 9th, 1900, all ground which has been staked as mining property and is allowed to lapse or abandoned shall become subject to relocation and entry immediately after its abandonment. Heretofore all such

properties reverted to the Crown and could not be relocated, and furthermore were held by the Government until sold at auction.

The new order implies that no properties reverting after October 9th shall be sold. They shall simply become public domain again, and be open to location by any free miner who may stake them. The orders received within the last 3 weeks include one throwing all reverted claims and all that have been withheld as alternate blocks of 10 claims by the Government open to sale by auction. This means the offering of perhaps 5,000 claims for sale.

About 300 of these claims were offered for sale recently. Two hundred of them were sold for \$19,900. The highest price paid was for a fraction on Gay Gulch, which brought \$1,350. A claim on Last Chance Creek brought the second best sum, \$1,225. Others sold as low as \$1 each, and many went for \$5 to \$20.

The remaining claims are scattered throughout the Klondike. All claims offered for sale at auction and not purchased will be thrown open for relocation 30 days after publication, which will probably be about December 15th. Claims that are not considered worth anything at auction are not likely to be located soon.

**MEXICO.**  
**Chihuahua.**

Guadalupe.—One of the largest mining deals made in Mexico recently is the sale of this mine, in the Cumbre District, to a syndicate of New York men by George Holmes. The consideration is said to have been over \$1,000,000.

Las Guijas.—This mine, located in the Nieves District, has been sold by Manuel Villegas to a company of Los Angeles, Cal., men.

Rosario.—This mine at Guadalupe y Calvo has just been purchased by Senator Clark, of Montana.

**Guerrero.**

More rich copper strikes are reported from this State and many American prospectors are going in. The building of the Mexico, Cuernava & Pacific Railroad makes the new mineral fields accessible.

**COAL TRADE REVIEW.**

**New York.**  
**Anthracite.**

Nov. 9.

All the anthracite roads are busy getting forward coal to localities where stocks are short. Retail buying has been very light over the whole country, owing to continual mild weather, but large amounts are needed to bring supplies up to normal, particularly at inland points. There are complaints of car shortage, particularly of box cars for the West. This shortage was marked last year, and as cars during the strike were diverted to other business, it will probably take some time to get car supply up to the normal.

The mines are not running smoothly yet, and will not be for a week or two. Some mines find laborers hard to get and will have their output restricted somewhat on this account. There are local troubles over dockage and similar grievances, and these local strikes are likely to cause more or less trouble all winter. Production for October was but 813,531 tons as compared with 4,899,303 tons in October, 1899, and 2,960,000 tons in September. The total production for 10 months is 34,745,620 tons, as compared with 38,435,659 tons last year. Evidently the 1900 production will be behind that of 1899.

Trade in Chicago territory is light, but a large amount of coal is wanted at the docks. Trade at the head of the lakes has also fallen off. Dealers are trying to get producers to hurry coal forward before navigation closes.

At the lower lake ports and at all inland ports coal is in great demand by dealers, though retail trade is light. At Eastern points steam sizes are in very short supply, particularly pea.

Prices are generally from 25 to 50c. higher than before the strike. We quote current prices f. o. b. New York Harbor ports for free-burning white ash as follows: Broken, \$4; egg, \$4.25; stove and nut, \$4.50; pea, \$3 buckwheat, \$2.50.

**Bituminous.**

The Atlantic seaboard soft coal trade is easier. Consumers find no trouble in getting all of the poorer grades of coal that they need, and the supply of better grades about equals the demand. Producers are still giving attention to the shoal water ports, and considerable coal is in transit for those ports. Some of the smaller vessels that supply this trade arrived at the shipping ports during the week, enabling shippers to increase the tonnage afloat.

Trade in the far East is still taking considerable coal. Consumers have laid in a lot, but it is thought that supplies in that territory are not yet equal to what they were at this time last year. The prospects are, however, that all consumers will be able to get their fall needs before ice forms. Along Long Island Sound consumers are calling for all the tonnage of better grades they can get and filling up any shortages

with the poorer grades. New York Harbor trade is fairly easy. All-rail trade is taking all the better grade available, probably about 75% of the total amount wanted. Lower grades are in good supply.

Transportation from mines to tide is now very good on the Pennsylvania, though still poor on the Baltimore & Ohio. Car supply is much improved, though scarcely up to the mark. In the coastwise vessel market, large vessels are plentiful, and small vessels are in better supply. We quote current rates from Philadelphia as follows: Providence, New Bedford and the Sound, 60@65c.; Boston, Salem and Portland, 70c.; Wareham, 75@80c.; Lynn, 85c.; Newburyport, 90@95c.; Portsmouth and Bath, 75c.; Bangor, \$1; Saco, \$1.10 and towages; Bardiner, \$1 and towages.

Prices are easier. Good Clearfield coal can be had for \$2.45, f. o. b. lower shipping port.

**Birmingham, Ala.** Nov. 5.  
(From Our Special Correspondent.)

There is an active demand for coal in this State. The operators are making strenuous efforts to accept part of the heavy business that can be secured, but their supply is far short of the demand, though mines are operating steadily and with good results. Prices obtained are better than they have been in four or five years. The output of this State is increasing right along, new mines being opened and old ones being enlarged. The Underwood Mining Company, whose mines in Blount County have been mentioned heretofore, are beginning to ship a little coal. The Southern Coal Company, which has a small mine in Walker County, 18 miles west of Birmingham, has made two new openings and will within the next fortnight begin shipping coal therefrom. The new mines of the Southern Cahaba Coal Mining Company, in Bibb County, will shortly be turning out coal. The barge line on the Mississippi River has as much to do hauling coal down the river as it can do. There is talk of increasing the carrying capacity. The railroads having all-rail lines to lower Mississippi and Louisiana are handling quantities of the product.

**Chicago.** Nov. 7.

(From Our Special Correspondent.)

Anthracite Coal.—There continues very little demand for anthracite coal. The backwardness of the season, combined with the coal miners' difficulties, have made of the market an exceptionally poor one, consumers in general having bought but moderately. Shippers look forward to the coming of winter weather, the most probable way toward a better demand. With all the disinclination on the part of dealers, etc., to use much hard coal, prices are firmly held, and the quoted circular prices—\$5.75@\$6—are likely to remain most of the winter. But little hard coal is being received and therefore the stocks in and about the city are growing gradually less.

Bituminous coal remains inactive, the warm weather affecting the demand. Consumers in general are taking enough only for present wants, and until colder weather sets in this state of affairs will last. Soft coal is piling up in the city and prices are being made to induce buying. The many large office buildings, hotels, etc., have had but little occasion to use soft coal for heating purposes so far this fall. The shortage of cars for carrying coal is becoming more evident.

**Cleveland, O.** Nov. 5.

(From Our Special Correspondent.)

The prospects for a heavier lake movement of coal are brighter now than they have been for weeks. The end of the hard coal strike has given Buffalo numerous cargoes of coal to offer to the lake tonnage. The vessels that have been carrying grain to Buffalo and coming back to Cleveland light to move soft coal are now taking their cargoes on board at the port of discharge, thus depriving the soft coal shippers here of the advantage of that tonnage. While this operates to stiffen the rates, it has not caused an increase in them so far. The only visible result has been in keeping in commission a number of boats that otherwise would have gone to their docks. Just now the heaviest movement is toward Lake Superior, both anthracite and bituminous coal being shipped liberally. The movement of grain down from Duluth is giving vessel room for any amount of up cargoes. The supply of cars to carry coal from the mines to the lakes has not increased in any way, therefore the shippers are hampered in the amount of coal they can ship. Vessels are plentiful for the Lake Michigan trade and the shipment has been as heavy as the condition of the docks and the supply from the mines will permit. The outlook now is that this condition will prevail as long as the lakes are open, for many contracts are yet to be filled and the demand in the upper lake region is larger than usual.

**Pittsburg.** Nov. 7.

(From Our Special Correspondent.)

Coal.—The Pittsburg Coal Company, the railroad coal combination, has some trouble with

the diggers at four of its mines this week. A dispute over the payment of the deadwork scale caused a strike. The mines are idle, but a settlement is likely to be made before the end of the week. The company has a better supply of railroad cars this week and expects to soon catch up in its deliveries. Despite the heavy demand there has been no advance in prices and no change is likely to be made this year.

Connellsville Coke.—There was a big increase in the production of Connellsville coke last week, but a falling off in the shipments. Prices remain unchanged and are likely to go higher after the first of the year. Furnace coke is quoted at \$2 and foundry at \$2.25@2.50. Outside producers quote foundry at \$1.75@2 and furnace at \$1.50. Of the 20,760 ovens in the region 14,746 are in operation and 6,014 are idle. The production last week was 152,027 tons, an increase of 4,779 tons over the preceding week. The shipments for the week aggregated 7,119 cars, distributed as follows: To Pittsburg and river tipples, 2,543 cars; to points west of Pittsburg, 3,176 cars; to points east of Connellsville, 1,400 cars. This was a decrease of 757 cars.

**San Francisco.** Nov. 3.

(From Our Special Correspondent.)

Coal receipts by water at San Francisco in October were 142,503 short tons. These receipts do not include California coal, nor coal from Rocky Mountain mines received by rail. For the 10 months ending October 31st the receipts were, in short tons:

	1899.	1900.
Eastern, anthr. bituminous.....	33,372	14,272
Oregon .....	43,064	31,430
Washington .....	511,701	538,405
Total domestic .....	588,137	584,107
British Columbia .....	382,970	497,139
Australia .....	127,457	145,860
Japan .....	10,050	6,100
Great Britain .....	98,047	65,014
Total foreign .....	618,524	714,113
Totals .....	1,206,661	1,298,220

The large imports in October have stocked up local yards. The contracts for fuel oil for locomotives and factories are beginning to have some effect on the coal trade, and will probably have more in the future.

**Foreign Coal Markets.**

Messrs. Hull, Blyth & Company, of London and Cardiff, report, under date of October 27th, that the market for coal at Cardiff is stagnant and new orders few. Prices are nominal, as follow: Best Welsh steam coal, \$5.04@5.16; seconds, \$4.08@4.92; thirds, \$4.50@4.80; dry coals, \$4.80; best Monmouthshire semi-bituminous, \$4.56; seconds, \$4.32; best small steam coal, \$3.12@3.48; seconds, \$3@3.12; other sorts, \$2.76@3.

These prices for Cardiff coals are f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire coals are all f. o. b. Newport, exclusive of wharfage, and are for cash in 30 days, less 2½% discount.

Freights from Welsh ports show a further decline. Some rates quoted on coal from Cardiff are: Gibraltar, \$2.16; Marseilles, \$2.30; Genoa and Naples, \$2.28; Port Said, \$2.76; Singapore, \$4.80; Las Palmas, \$2.04; St. Vincent, \$2.22; St. Lucia, \$2.46; Buenos Aires, \$3.36; Rio Janeiro, \$4.06; Santos, \$4.32.

In France coal remains high, with little prospect for relief. The reduction in imports from Great Britain is felt, as the chief foreign supply has been hitherto from that country.

An example of coal prices in the larger French towns is given in a late consular report from Rouen. Coal there has been selling, according to quality, at from \$11 to \$13, and an advance to \$14 and \$15 has just been ordered.

The heavy fall in iron and steel in Germany, and the semi-panic in industrials have affected the coal market. There is less said of coal famine, and there will probably be a fall in coal prices, as the syndicates can hardly keep them up much longer in the face of falling demand from the iron and steel makers.

Foreign inquiries for coal continue to be received here and contracts for export are closed daily. There has been a little holding back from a mistaken idea prevailing abroad that the anthracite strike affected all our coal production, and that higher prices were to be expected. This, however, will soon pass over.

Charters this week from the United States included one from Philadelphia to Lisbon at 17s. (\$4.08), and another from Norfolk to Genoa at 19s. (\$4.56), both sailing in the near future.

**SLATE TRADE REVIEW.**

**New York.** Nov. 9.

Shipments from Slatington and Walnutport, Pa., in October were 22,389 squares roofing slate, 2,330 cases school slates, and 2,960 crates blackboards. In the ten months ending October 31st these shipments amounted to 167,596 squares roofing (183,473 squares in 1899), 18,622 cases school slates (15,613 cases in 1899), and 18,640

crates blackboards (21,035 crates in 1899). Thus it will be seen that this year's movement of roofing slate is 8% less than 1899, and blackboards 1% less, while school slates show an increase of 2%.

Export trade shows no improvement, as stiff freight rates are prohibiting shipments. On the other hand, the Welsh quarrymen are meeting us in offering favorable prices to consumers.

Business is a little better, and dealers are laying in more stock in anticipation of larger sales in the spring. Many of the quarries are rushing work before the frosty weather sets in.

The list of prices per square for No. 1 slate standard brand f. o. b. at quarries in car-load lots, is given below:

Size, inches	Monson or Br. V.ille.	Bangor.	Bangor. Ribbon.	Alb'n. or Jackson Bangor.	Cha P'n Keys ne	Pench Bottom.	Sea Gr'n.	Unfad'g Green.	Red.
24 x 14	6.50	3.50	3.00	3.00	5.10	2.90	2.90	3.75	.....
24 x 12	6.60	3.50	3.00	3.00	3.80	5.25	2.90	3.75	.....
22 x 12	6.60	3.50	3.25	3.00	4.00	5.25	2.90	4.00	.....
22 x 11	6.50	3.75	3.25	3.00	4.00	5.25	2.90	3.75	.....
20 x 11	6.90	3.75	.....	3.25	.....	5.25	2.90	.....	.....
20 x 10	6.80	4.25	3.50	3.25	4.00	5.35	2.90	4.25	18.50
18 x 12	6.80	3.75	.....	3.00	.....	5.25	2.90	3.50	.....
18 x 11	7.00	.....	.....	.....	.....	2.90	3.75	.....	.....
18 x 10	7.00	4.25	3.50	3.25	4.00	5.35	2.90	4.00	10.50
18 x 9	7.00	4.50	3.50	3.25	4.00	5.35	2.90	4.25	10.50
16 x 12	6.80	3.75	.....	3.00	.....	2.85	3.50	.....	.....
16 x 10	7.00	4.25	3.50	3.25	4.00	5.25	2.85	4.00	10.50
16 x 9	7.00	4.25	3.50	3.25	4.00	5.35	2.85	4.25	10.50
16 x 8	7.00	4.50	3.50	3.25	4.25	5.35	2.85	4.25	10.50
14 x 10	6.80	3.75	3.25	3.00	.....	5.25	2.70	3.75	10.50
14 x 9	6.50	.....	.....	.....	.....	2.70	3.75	10.50	.....
14 x 8	6.80	3.75	3.25	3.00	4.00	5.10	2.70	4.25	10.50
14 x 7	6.40	3.75	3.25	3.00	3.75	5.10	2.50	3.25	.....
12 x 10	5.75	.....	.....	.....	.....	2.50	3.25	.....	.....
12 x 9	5.60	.....	.....	.....	.....	2.50	3.25	.....	.....
12 x 8	5.50	3.50	.....	2.85	.....	4.85	2.50	3.50	9.00
12 x 7	5.00	3.25	.....	2.85	3.25	4.85	2.25	3.50	9.00
12 x 6	4.80	3.25	.....	2.85	3.25	4.75	2.25	3.50	8.50

A square of slate is 100 sq. ft. as laid on the roof

IRON MARKET REVIEW.

NEW YORK, Nov. 9, 1900.

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending				From Jan., '99.		From Jan., '00.	
	Nov. 10, 1899.	Nov. 9, 1900.	Nov. 9, 1900.	Nov. 9, 1900.	Tons.	Tons.	Tons.	Tons.
An'racite & Coke.	241	277,700	182	215,550	11,234,529	11,935,339		
Charcoal.	25	6,450	31	8,325	234,847	325,160		
Totals..	266	284,150	213	223,875	11,469,376	12,260,499		

Reports from all quarters show an increase of business, especially in foundry irons, for which large contracts have been placed. This has led to greater firmness in prices, and there has been more uniformity in sales. A late dispatch reports that an increase of 50c. a ton will be made on all grades of Southern pig iron, but it is doubtful whether this will be enforced. The export season for the Southern furnaces has now set in, as ship room is abundant at the cotton ports; the trade promises to be a large one this year. Bessemer pig has been much more quiet than foundry irons, but some larger sales of basic pig are noted.

In finished material the demand is good, especially for bridge and structural work, for which some large contracts have been placed. The rail question is still unsettled.

A meeting of all the large steel interests is to be held soon to settle the billet question and some others. The result is very doubtful, as there are many conflicting interests.

There has not yet been time to see what effect the result of the election may have on the iron trade, but the general belief is that it will be favorable.

Birmingham, Ala. Nov. 5.

(From Our Special Correspondent.)

The last week of October saw a slight improvement in the market in this section and the shipments of pig iron were quite brisk, though the greater part of that product sent out went for export. The first week of November saw a number of inquiries and a few orders. The furnaces continue to manufacture the usual quota of iron. The accumulation has not been so great lately as it was a few weeks since, but still it has been noticeable right along and the yards hereabouts have a large quantity of iron on hand. Some good shipments of export iron were made during the past week to Savannah, Ga., New Orleans, La., Brunswick, Ga., and Pensacola, Fla. There have been no changes in the pig iron quotations lately. The prices are fluctuating very little.

The finished iron market continues a little quiet and the rolling mills in this district are not working as hard as they might. The Bessemer rolling mills were idle for 3 weeks because of the strike of the employees in sympathy with the strikers in the steel plant at Ensley, which plant is also owned and operated by the Tennessee Coal, Iron and Railroad Company. Both will resume work this week. All departments in the Birmingham mills, which are owned and

operated by the Republic Iron and Steel Company, are not in operation. The Gate City mills, which also belong to the Republic Company, are working in full. It is reported in this district that the Republic Iron and Steel Company is dicker for the purchase of the Bessemer rolling mills from the Tennessee Company. The Bessemer mills are in very good shape.

The pipe foundries are doing fairly well. The Dimmick Pipe plant at North Birmingham is busy. During the past week shipments of 11 car-loads of pipe for Vancouver, B. C., were made and it is stated that a few good orders from foreign countries have been offered. The pipe works at Bessemer and Anniston, belonging to the United States concern, are not doing their best.

Quotations are given as follows: No. 1 foundry, \$11.50@12; No. 2 foundry, \$11@11.50; No. 3 foundry, \$10.50@11; No. 4 foundry, \$9.50@10; gray forge, \$9.25@9.50; No. 1 soft, \$11.50@12; No. 2 soft, \$11@11.50.

Buffalo. Nov. 7.

(Special Report of Rogers, Brown & Co.)

Orders aggregating a large tonnage are being telegraphed, mostly accepting quotations which were obtained last week. One Pennsylvania furnace company which has been crowding the market has advanced its limits 50c. per ton on the foundation of several good sized orders which have provided for its accumulated stock. The probability is there will be a lining up in the market to more uniform quotations than have recently existed, and a larger volume of tonnage, now that the national policy is forecasted for another period of years. We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 Strong Foundry coke iron, Lake Superior ore, \$15; No. 2, \$14.50; Southern soft No. 1, \$15; No. 2, \$14.50; Lake Superior charcoal, \$17; coke malleable, \$14.

Chicago. Nov. 7.

(From Our Special Correspondent.)

Pig Iron.—Actual sales for the week have been numerous, but nearly all were for 1,000 tons or less, one of 2,000 and another of 2,500 tons being the largest. The Northern furnaces have booked the greater part of the business. Immediate shipment is very generally required on orders placed at present for small lots. There is a large inquiry and a large tonnage is expected. Some small concessions are being made on certain grades, but generally prices are quite firm. They are: Lake Superior charcoal, \$17@17.50; local coke foundry, No. 1, \$15@15.50; No. 2, \$14.50@15; No. 3, \$14@14.50; local Scotch No. 1, \$15@16; Ohio strong softeners, No. 1, \$16@16.50; Southern silvery, according to silicon, \$15.50@16.50; Southern coke, No. 1, \$14.50@15; No. 2, \$14@14.35; No. 3, \$13.50@14.10; Southern, No. 1 soft, \$15@15.35; No. 2 soft, \$14@14.35; foundry forge, \$12.75@13.50; malleable Bessemer, \$14.50@15; standard Bessemer, \$14.50@15.

Cleveland, O. Nov. 6.

(From Our Special Correspondent.)

Iron Ore.—With one week of November gone, it becomes apparent that the movement of wild ore down the lakes from now forward is to be light. The contract season is past and the cargoes that will be carried from now on will not exceed the capacity of the boats owned by the big steel concerns and those which are under contracts which run through this month. The outlook now is for a movement approximating 18,500,000 tons during the year. It has been thought until now that sales of ore would be made for delivery during the remainder of the year, but the great difference in the price will preclude any such possibility. The ore men are in no hurry to make the price for next year, hoping that the demand for the product will allow them some latitude in that regard. At present the prospects are for a low rate. In the absence of any sales the Association prices are quoted: Bessemer, \$5.50; non-Bessemer, \$4.25 old range; Mesabi, \$4.25.

Pig Iron.—The increased sales of late have stiffened prices some. On foundry irons No. 1 is still selling for \$14 and No. 2 for \$13.50, but the market is stronger, with possibilities for an advance brighter than they have been. Off irons have sold for \$12, which is a big increase over what has been paid of late. Nothing is being done in Bessemer irons. The Bessemer men object to selling the iron now on the stock piles for less than it cost to produce it. The consumers object to paying what the furnace-men ask.

Finished Material.—The price of plates holds at \$1.25, where it was fixed a week ago. The sales have not been large this week. The deadlock in the rail situation still prevails. Talk of a compromise rate is now being heard. Bars are in good demand, and as deliveries are exceedingly slow, the rates have been advanced to \$1.25, Cleveland. Consumers are not objecting seriously, being willing to transact what business they may at that figure. The deliveries are so slow that buyers are satisfied to get material at any price. In shapes a moderate business has been done at unaltered prices. The demand now is for steel car axles, the railroads laying in heavy orders.

Old Iron.—Dealers are buying slightly, but are adding their purchases to their stock piles, being able to dispose only of small lots. The market quotations are: Old iron rails, \$17.50; old steel rails, \$12; car wheels, \$17.50; machinery cast, \$12.50; stove plate, \$9.

Philadelphia, Pa. Nov. 7.

(From Our Special Correspondent.)

Pig Iron.—A canvass of all pig iron offices this morning reveals a most satisfactory condition. Some telegrams have been received as to prices and three or four ordering iron at previously named prices. There is a very strong feeling that prices will advance a little on best grades, but the anxiety of makers of other irons to sell or get orders will not lead to an immediate advance. It is, of course, too soon to speak with exactness as to what will be done. Prices are: No. 1 foundry, \$16@17.25; No. 2, \$15@16; No. 2 plain, \$14.50@15; standard gray forge, \$13.75@14.25; ordinary, \$13; basic, \$14; low phosphorus, \$22.50.

Billets.—Billets have hardened and inquiries were wired to-day for best prices on large blocks. The impression to-day is that a rush of buyers west and east will soon be manifested. Quotations, \$20.50@21. Basic open-hearth, \$21.50.

Merchant Bars.—The retail demand has been increasing for two or three weeks. Office men representing interior mills said this morning they are confident that a great deal of iron will now be contracted for and that the top quotations will be paid without question. It also transpires that car-builders were wise enough and successful enough to secure options on considerable iron which will be closed this week. Some Western roads are in urgent need of cars for grain, and orders are now to be placed. The average price is 1.25@1.30c.

Skelp.—The mills on skelp in the East are as well supplied with work as at any time since September 1st, but the recent orders booked were not taken at the advanced quotations.

Pipes and Tubes.—The business booked during the past 30 days has hardened quotations and the prospect is that exceptionally large contracts will be placed in a short time.

Plates.—The manufacturers' spokesmen here report that the amount of work now on the books forbids the possibility of any break in prices. This statement was drawn out by the rumor that a cut is to be made in iron and steel plate at Pittsburg.

Structural Material.—All mills are equally busy and equally provided with work. The statement has gained credence that large bridge building contracts will be placed this month, in view of the greater pressure that may be experienced later on.

Steel Rails.—The officials and some people who stand near to them say that the railroad people who are holding back for lower quotations will willingly pay \$26 as soon as they find the strong undertone to the market. It is known, however, that there will be no smooth acquiescence in the present quotation.

Scrap.—There is quite an active demand for scrap. Choice railroad, \$16.50; steel axles, \$17; old car wheels, \$16.50; heavy steel scrap, \$14@14.50; light scrap, \$11; machinery cast, \$14.

Pittsburg, Pa. Nov. 7.

(From Our Special Correspondent.)

The buying of iron and steel products continued to improve during the week. Prices in some lines are firmer and higher. Several thousand tons of Bessemer pig iron were sold during the week at a slightly higher rate than last week. The minimum price was \$13.75, and several small lots sold at \$14, Pittsburg, delivered this year. The total sales of Bessemer pig iron for October aggregated nearly 40,000 tons, which was more than the sales for the preceding six months. A meeting of the Bessemer Furnace Association is scheduled to be held in Cleveland to-morrow, the object being to fix the price of Bessemer pig iron for delivery after January 1st. It seems certain now that the rate fixed will not be less than \$14 at furnace. This will mean probably \$15 delivered at Pittsburg. There was a slight falling off in the buying of foundry and forge iron during the week, but prices were advanced. No. 2 foundry iron sold at \$13.75@14.50, an increase of 50c., and forge iron at \$12.75. The Kittaning Iron Company's furnace at Kittaning resumed operations this week on foundry and forge iron. The Cherry Valley Iron Company's furnace at Leetonia, O., has gone out of blast for relining. The work is to be done as rapidly as possible and the furnace will soon be in blast again. No definite action was taken at the meeting of steel manufacturers in New York last week on prices for Bessemer steel billets. The meeting was adjourned until to-day and it is likely that a uniform price for billets will be agreed upon. A number of inquiries for billets for next year's delivery are being received and manufacturers are quoting \$20, but none seems anxious to make contracts at that price. Several small lots were sold this week at \$18.50, an advance of 50c. over the price of last

week. The mills in this district are rushed, as specifications for finished products are coming in more rapidly than anticipated. Many of the mills have fallen behind in deliveries. The demand for plates is stronger this week and prices are much firmer. The tin plate trade is also improving and on Monday the American Tin Plate Company put its other New Castle plant in operation. It has 20 mills, making 50 mills running in full in that town. The Carnegie Steel Company has received several additional orders for steel rails this week and some heavy contracts are expected to be placed within the coming week.

**Pig Iron.**—Sales of Bessemer pig iron this week amounted to about 3,000 tons, the price ranging from \$13.75 to \$14, Pittsburgh. Foundry and forge iron sales fell off somewhat, but prices are higher. No. 2 foundry is quoted this week at \$13.75@ \$14.50 and forge iron at \$12.75.

**Steel.**—Probably 1,000 tons of Bessemer steel billets were sold this week at \$18.50. Manufacturers are quoting \$20 for delivery after the first of the year. Tank plates are decidedly firmer, the lowest price being 1.25c.

**Sheets.**—There is an excellent demand for sheets, but prices are low. No. 28 gauge is still quoted at 2.85@2.90c. and No. 27 at 2.80@2.85c.

**Ferro-manganese.**—The price remains at \$75 for 80% domestic and the demand is good.

**New York.** Nov. 9.

The local iron market shows prospects of greater activity. Some lines are rather dull, but dealers are confident of better business. Export trade is fair. We note recent shipments of machinery to Italy; \$30,000 worth of track material and other railroad material to Ecuador; \$175,000 of agricultural machinery, \$30,000 worth of manufactured iron, \$30,000 worth of railroad material, \$17,000 worth of steel plates and \$18,000 worth of pumping machinery to Australia; and \$16,000 worth of manufactured iron to Germany.

**Pig Iron.**—There is a decidedly firmer tone to the market and every prospect of a decided increase in the volume of business. We quote for Northern irons, tidewater delivery: No. 1 X foundry, \$16.25@17; No. 2 X, \$15.25@15.75; No. 2 plain, \$14.50@15; gray forge, \$14@14.50. For Southern irons on dock, New York, No. 1 foundry, \$15.50@15.75; No. 2, \$14.50@14.75; No. 3, \$13.50@13.75; No. 4, \$13@13.50; No. 1 soft, \$15.50@15.75; No. 2, \$14.25@14.50.

**Bar Iron and Steel.**—Demand has fallen off of late, but dealers look for improvement soon. We quote common bars at 1.20@1.25c. for large lots on dock; refined bars, 1.35@1.40c.; soft steel bars, 1.25c.

**Plates.**—Manufacturers have been in consultation in this city. Demand is good. We quote for large lots at tidewater: Tank, 1/4-in. and heavier, 1.35@1.45c.; shell, 1.55c.; flange, 1.60c.; marine, 1.65@1.70c.; universal, 1.35c.

**Steel Rails and Rail Fastenings.**—Buying is but moderate. Light rails are still selling between \$25@30. Standard sections are quoted at \$26. Splice bars are 1.25@1.35c.; spikes, 1.45c.; fish plates, 1.25c.; bolts, 2.05@2.25c.

**Structural Materials.**—Demand is fair. We continue to quote large lots at tidewater: Beams 1.65c.; channels, 1.65c.; angles, 1.30c.; tees, 1.70c.; zees, 1.65c.

**METAL MARKET.**

**New York.** Nov. 9.  
**Gold and Silver.**

**Gold and Silver Exports and Imports**

At all United States ports in September and year.

Metal.	September.		Year.	
	1899.	1900.	1899.	1900.
<b>GOLD.</b>				
Exports	\$618,995	\$794,962	\$32,877,838	\$52,574,745
Imports	2,593,894	3,977,359	34,268,421	36,104,916
<b>SILVER.</b>				
Exports	\$1,974,899	\$3,182,397	\$1,390,583	\$16,469,829
Imports	3,622,041	5,723,708	38,738,431	47,501,891
	2,376,846	4,140,675	22,724,095	30,151,150
<b>Excess</b>	<b>E. \$1,245,195</b>	<b>E. \$1,583,033</b>	<b>E. \$16,014,336</b>	<b>E. \$17,350,741</b>

These figures include the exports and imports at all United States ports, and are furnished by the Bureau of Statistics of the Treasury Department.

**Gold and Silver Exports and Imports, New York**

For the week ending November 8th, 1900, and for years from January 1st, 1890, 1899, 1898, 1897.

Period.	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
<b>Week</b>	\$5,000	\$1,867,579	\$910,495	\$35,006	I. \$987,090
1900.	36,644,003	7,319,722	34,107,136	4,117,431	E. 59,313,986
1899.	11,648,849	13,642,621	24,898,166	3,261,968	E. 19,642,506
1898.	7,438,729	95,603,873	29,060,986	2,649,012	I. 61,723,171
1897.	48,170,931	13,366,764	40,372,298	2,603,436	E. 72,573,001

Imports of gold were from France and Great

Britain; exports were to the West Indies. Imports of silver were from Mexico and the West Indies; exports were chiefly to London.

The United States Assay Office in New York reports the total receipts of silver at 108,000 oz. for the week. Total since January 1st, 4,235,000 oz.

**Average Prices of Silver per oz. Troy.**

Month.	1900.		1899.		1898.	
	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.
January...	27.30	59.30	27.42	59.36	26.29	56.77
February...	27.49	59.76	27.44	59.42	25.89	56.07
March.....	27.59	59.81	27.48	59.64	25.47	54.90
April.....	27.41	59.59	27.65	60.10	25.95	55.02
May.....	27.56	59.96	28.15	61.23	28.31	56.92
June.....	27.81	60.42	27.77	60.43	27.09	58.61
July.....	28.23	61.25	27.71	60.26	27.32	59.06
August.....	28.13	61.14	27.62	60.00	27.48	59.54
September	28.85	62.63	27.15	58.89	28.05	60.68
October ..	29.58	63.83	26.70	57.98	27.90	60.42
November ..	.....	.....	27.02	58.67	27.93	60.60
December ..	.....	.....	27.21	58.99	27.45	59.42
<b>Year.....</b>	.....	.....	27.44	59.58	26.76	58.20

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

**Average Prices of Metals per lb., New York**

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1900.	1899.	1900.	1899.	1900.	1899.	1900.	1899.
Jan.....	15.58	14.26	27.07	22.48	4.68	4.18	4.65	5.34
Feb.....	15.78	17.02	30.58	24.20	4.675	4.49	4.64	6.28
March.....	16.29	16.35	32.90	23.82	4.675	4.37	4.60	6.31
April.....	16.76	17.13	30.90	24.98	4.675	4.31	4.71	6.67
May.....	16.34	17.20	29.37	25.76	4.181	4.44	4.53	6.88
June.....	15.75	16.89	30.50	25.85	3.901	4.43	4.29	5.98
July.....	15.97	17.10	33.10	29.63	4.030	4.52	4.28	5.82
August.....	16.35	17.42	31.28	31.53	4.250	4.57	4.17	5.65
Sept.....	16.44	17.34	29.42	32.74	4.350	4.58	4.11	5.50
October.....	16.37	16.94	28.54	31.99	4.350	4.375	4.15	5.32
Nov.....	.....	.....	.....	28.51	.....	4.375	.....	4.64
Dec.....	.....	15.85	.....	25.88	.....	4.64	.....	4.66
<b>Year.....</b>	.....	16.67	.....	25.12	.....	4.47	.....	5.75

Commencing with March 17th, the prices given in the table for copper are the averages for electrolytic copper; this is the case for both 1899 and 1900. The average price for Lake copper for the year 1899 was 17.61c. For January, 1900, the average price of Lake copper was 16.33c.; for February, 16.08c.; for March, 16.55c.; for April, 16.94c.; for May, 16.58c.; for June, 16c.; for July, 16.16c.; for August, 16.58c.; for September, 16.69c.; for October, 16.61c.

**Prices of Foreign Coins.**

	Bid.	Asked
Mexican dollars.....	\$ 50%	\$ .51 1/2
Peruvian soles and Chilean pesos ..	.46	.47 1/2
Victoria sovereigns.....	4.85	4.88
Twenty francs.....	3.85	3.88
Twenty marks.....	4.74	4.80
Spanish 25 pesetas.....	4.78	4.82

**Financial Notes of the Week.**

The election being over, there is every probability of improvement in business. The time has been too short to show this anywhere except in the speculative markets, which have already shown heavy rises in price and great activity.

The silver market has declined, owing to lack of orders from China and India. No special nor Continental inquiries have contributed to sustain the price prevailing earlier in the week; consequently sellers have been obliged to contract at receding prices. The outlook, however, is considered to be good.

The statement of the United States Treasury on Wednesday, November 7th, shows balances in excess of outstanding certificates as below, comparison being made with the statement of the corresponding day last week:

	Oct. 31.	Nov. 7.	Changes.
Gold.....	\$92,551,289	\$93,301,453	I. \$750,164
Silver.....	6,812,343	6,639,910	D. 172,433
Legal tenders.....	11,506,670	10,491,021	D. 1,015,649
Treas. notes, etc.....	660,122	38,522	D. 621,600
<b>Totals.....</b>	<b>\$111,530,424</b>	<b>\$110,470,906</b>	<b>D. \$1,059,518</b>

Treasury deposits with national banks amounted to \$99,203,951, showing an increase of \$2,015,026 for the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House for the week ending November 3d—gives the following totals, comparison being made with the corresponding weeks in 1899 and 1898:

	1898.	1899.	1900.
Loans and discounts.....	\$678,845,100	\$695,536,100	\$792,330,300
Deposits.....	769,087,400	755,868,200	841,775,200
Circulation.....	15,633,900	16,211,700	30,717,800

Reserve:  
Specie..... 157,428,800 140,461,000 158,043,100  
Legal tenders..... 53,866,100 48,167,700 58,351,100  
**Total reserve..... \$211,294,900 \$188,628,700 \$216,394,200**  
Legal requirements..... 192,271,250 188,967,050 210,443,500  
Balance, surplus..... \$19,023,650 ..... \$5,950,400  
Changes for the week, this year, were increases

of \$157,800 in circulation and \$404,100 in legal tenders; decreases of \$1,054,300 in loans, and discounts, \$1,616,300 in deposits, \$890,400 in specie and \$81,425 in surplus reserve.

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

**Imports and Exports of Metals.**

Port.	Week, Nov. 7.		Year 1900.	
	Expts.	Impts.	Expts.	Impts.
<b>New York.</b>				
(N. Y. Metal Exchange.)				
Aluminum..... long tons	22	.....	133	87
Antimony ore.....	.....	166	.....	2,518
" regulus.....	.....	60	.....	1,730
Chrome ore.....	.....	.....	.....	1,500
Copper, fine.....	1,697	694	89,336	17,239
" matte.....	.....	54	3,740	246
" ore.....	.....	6,379	.....	50,261
" ash.....	.....	.....	.....	98
Ferro-Chrome.....	.....	.....	.....	31
Ferro-manganese.....	.....	.....	.....	710
Iron ore.....	.....	.....	.....	21,477
" pig, bar, rod.....	1,342	.....	16,794	6,125
" pipe.....	.....	.....	12,143	157
" plates, sheets.....	.....	.....	1,016	18
Lead.....	960	2,550	67,845	60,014
" ore.....	.....	.....	.....	9,700
" dross.....	.....	.....	.....	24
Manganese, ore.....	.....	.....	.....	9,492
Metals, old, scrap.....	90	97	4,350	6,179
Composition.....	53	200	2,973	385
Nails.....	276	.....	17,170	108
Nickel.....	30	.....	2,100	108
" ore, matte.....	.....	.....	.....	5,393
Rail'd material.....	117	70	5,382	6,673
Rails, old.....	456	.....	7,485	518
Spiegeleisen.....	.....	.....	.....	3,377
Steel bars, plates.....	1,474	340	42,582	15,607
" rails.....	3,759	.....	55,517	18
" wire.....	398	.....	25,031	78
" not speci'd.....	460	48	11,167	2,523
Tin.....	.....	310	5	22,293
" and black plates.....	.....	451	.....	32,462
Zinc.....	.....	49	675	455
" dross.....	.....	.....	701	50
" ashes, skim.....	136	.....	1,124	20
ore.....	1,636	.....	13,304	.....
<b>Baltimore.</b>				
(Special Correspondence.)				
Chrome ore..... long tons	.....	511	34,545	4,364
Copper, fine.....	.....	.....	.....	155
Ferro-manganese.....	.....	.....	4,685	22,402
Iron pig, bar, etc.....	.....	5,472	366,042	37,475
" ore.....	.....	.....	3,720	117,913
" pyrites.....	.....	590	568	2
Manganese ore.....	.....	.....	1,361	85
Metals, old & Rails.....	.....	21	5,450	811
Nails.....	.....	.....	.....	146
Pipe, iron & steel.....	.....	.....	.....	919
Silicon.....	.....	.....	.....	73,685
Spiegeleisen.....	.....	33	.....	205
Steel, bars, etc.....	146	345	36,810	146
" wire.....	.....	.....	.....	.....
" rails.....	.....	.....	.....	.....
Tin.....	.....	.....	.....	.....
" and black plates.....	.....	108	.....	2,912
<b>Philadelphia.</b>				
(Week ending Nov. 3.)				
Antimony..... long tons	.....	.....	.....	14
Chrome ore.....	.....	.....	.....	3,650
Copper, fine.....	.....	.....	3,894	35,595
" ore.....	.....	.....	.....	100
" pyrites.....	.....	.....	1,355	3,827
Iron, pig.....	.....	6,800	13,120	253,020
" ore.....	.....	.....	.....	87,455
" pyrites.....	.....	.....	.....	76,900
Manganese ore.....	.....	.....	.....	4,153
Spiegeleisen.....	.....	.....	.....	648
Tin.....	.....	25	.....	2,524
" and black plates.....	.....	.....	.....	67
Zinc.....	.....	.....	.....	4,307
" ore.....	.....	.....	.....	.....

**Total United States.**

Articles.	Sept. 1900.		Year, 1900.	
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with the holdings at the corresponding date last year:

	1899.		1900.	
	Gold.	Silver.	Gold.	Silver.
Banks.				
N.Y. Ass'd.	\$140,461,000		\$158,043,100	
England.	167,058,050		162,124,430	
France.	377,370,400	\$233,880,530	458,569,680	\$222,567,585
Germany.	116,755,000	60,145,000	130,665,000	67,305,000
Spain.	68,000,000	69,400,000	68,495,000	83,425,000
Aus.-Hun.	153,825,000	52,435,000	189,510,000	48,825,000
Neth'l'ds.	14,870,000	29,255,000	21,355,000	27,890,000
Belgium.	14,570,000	7,285,000	13,890,000	6,945,000
Italy.	77,230,000	7,195,000	76,925,000	8,215,000
Russia.	427,075,000	21,940,000	352,255,000	30,405,000

The returns of the Associated Banks of New York are of date November 3d, and the others are of date November 2d, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to October 25th, 1900, are reported by Messrs. Pixley & Abell's circular as follows:

	1899.	1900.	Changes.
India	£4,417,025	£5,176,507	£759,782
China	1,069,182	1,810,916	£741,734
The Straits	265,586	725,816	£460,230
Totals	£5,751,793	£7,713,339	£1,961,746

Arrivals for the week, this year, were £188,000 in bar silver from New York, \$10,000 from Australia, and \$10,000 from the West Indies; total, £208,000. Shipments were £196,000 in bar silver to Bombay, £34,950 to Hong Kong and £10,000 to Shanghai; total, £240,950.

Indian exchange continues steady at 15.94d. per rupee, with a good demand for Council bills in London. There is nothing new in relation to silver shipments to India.

The coinage executed at the mints of the United States in October and the 10 months of this year is reported by the Bureau of the Mint, Treasury Department, as below:

Denominations	October		Ten Months	
	Pieces.	Value.	Pieces.	Value.
Double eagles.	256,000	\$5,120,000	3,517,542	\$70,350,840.00
Eagles	374,918	3,749,180.00	3,749,180.00	
Half eagles	1,465,677	7,203,295.00	7,203,295.00	
Quar. eagles	27,136	67,840.00	67,840.00	
Total gold	256,000	\$5,120,000	5,388,273	\$81,371,155.00
Dollars	3,002,000	3,002,000	20,609,612	20,609,612.00
Half-dollars	1,326,000	663,000	8,382,612	4,191,306.00
Quar.-dollars	1,620,000	405,000	13,443,197	3,360,799.25
Dimes	780,000	78,000	21,318,882	2,131,888.20
Total silver	6,728,000	\$4,148,000	63,745,303	\$30,284,605.45
Five c. nickels	3,680,000	184,000	20,437,195	1,021,859.75
One c. bronze	5,651,000	56,510	47,782,964	477,829.64
Total minor	9,341,000	240,510	68,220,159	\$1,499,721.39
Total Coinage	16,325,000	\$9,508,510	137,353,732	\$113,155,481.84
Total, 1899	22,489,139	\$11,838,181	103,354,516	\$120,020,309.69

The coinage in October, this year, shows an increase of \$3,067,672 over the previous month, chiefly in gold. The 10 months, this year, the total coinage shows a decrease of \$6,864,828, or 5.7%, as compared with the corresponding period in 1899.

The Treasury Department's estimate of the money in the United States on November 1st is as follows:

	Total Stock.	In Treasury.	In Circulation.
Gold coin (inc. bullion in Treas.)	\$1,080,027,407	\$242,670,175	\$821,761,263
Gold Certificates			215,595,969
Silver Dollars	500,081,162	5,220,948	73,479,469
Silver Certifi.			421,380,745
Subsid. Sil	86,676,285	5,641,098	81,035,187
Treas. Nts of 1890.	65,563,000	84,540	65,478,460
U. S. Notes	346,081,016	11,605,955	333,295,061
Currency Certifi.			1,780,000
Nat. Bank Notes	331,035,648	6,318,330	325,375,258
Totals	\$2,410,722,518	\$271,541,106	\$2,139,181,411

For redemption of outstanding certificates an exact equivalent in amount of the appropriate kinds of money is held in the Treasury, and is not included in the account of money held as assets of the Government. This statement of money held in the Treasury as assets of the Government does not include deposits of public money in National bank depositaries to the credit of the Treasurer of the United States, and amounting to \$89,818,485. The estimated population of the United States, 76,891,000, is based upon the census of 1900. The estimate published October 1st was based upon the census of 1890 and was about 1,400,000 in excess of the real population. The correction of this estimate together with the increase during the month of October in the volume of money in circulation increases the estimated circulation per capita from \$27.01, as it was stated in the October statement, to \$27.82, as above. The total amount in circulation shows an increase of \$25,886,429 over October 1st, 1900, and of \$175,465,264 over November 1st, 1899.

Other Metals.

Daily Prices of Metals in New York.

November.	Sterling Exchange.	Silver.			Copper.				Spelter.	
		Fine oz. Cts.	London.	Pence.	Lake, cts. & lb.	Electrolytic @ lb.	London \$ & ton.	Tin, cts. & lb.	Lead @ lb.	N. Y. cts. & lb.
3	4.83%	64 1/2	29 1/2	16 1/2	16 1/4 @ 16 1/2	72	27 1/2	4.32 1/2 @ 4.37 1/2	4.20	4.05
5	4.83%	64 1/4	29 1/2	16 1/2	16 1/4 @ 16 1/2	72	27 1/2	4.32 1/2 @ 4.37 1/2	4.20	4.05
6			29 1/2				27 3/8			
7	4.83%	63 3/4	29 1/2	16 1/2	16 1/4 @ 16 1/2	72 3/4	27 3/4	4.32 1/2 @ 4.37 1/2	4.20	4.05
8	4.84	63 1/2	29 1/2	16 1/2	16 1/4 @ 16 1/2	72 1/2	28	4.32 1/2 @ 4.37 1/2	4.20	4.05
9	4.84	63 3/4	29 1/2	16 1/2	16 1/4 @ 16 1/2	72	27 3/4	4.32 1/2 @ 4.37 1/2	4.20	4.05

London quotations are per long ton (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—The market is active and firm. As anticipated, the favorable outcome of the elections has much improved business. We learn of numerous transactions, both for early and distant deliveries. European demand is also better. As yet prices have not been much affected and we quote Lake copper at 16 1/2c.; electrolytic in cakes, wirebars and ingots at 16 1/4c.; in cathodes at 16 1/4c.; casting copper at 16 1/4c.

The London market for Standard copper has ruled slightly higher. It closed last week at £71 15s. for spot, £72 7s. 6d. for three months, and opened on Monday 5s. higher. On Tuesday it was £72 7s. 6d. for spot, £73 for three months. It closes at £72 for spot, £73 12s. 6d. three months.

Refined and manufactured sorts we quote: English tough, £75 5s. @ £75 15s.; best selected, £78 5s. @ £78 15s.; strong sheets, £86; India sheets, £83 @ £84; yellow metal, 6 1/4 @ 6 1/2d.

Tin.—The market here has been dull and business of small volume, in contrast with the London market, where prices have fluctuated considerably and a fair business is reported. We quote spot tin here at 27 3/4c., December delivery at 27 1/2c.

The London market, which closed last week at £125 for spot and £122 10s. for three months, opened at the same figure. On Tuesday it advanced £2, and on Wednesday it advanced to £128, but reacted again to £127 2s. 6d., and on Thursday it was £127. It closes at £126 5s. for spot, £124 for three months.

Lead.—A good business is doing from day to day at last prices. We quote New York at 4.32 1/2 @ 4.37 1/2c., St. Louis at 4.20 @ 4.22 1/2c.

The foreign market is unchanged. We quote Spanish lead at £17 12s. 6d., English 2s. 6d. higher.

Spelter.—The market is somewhat firmer. Some large orders have been placed this week and sellers are inclined to raise their prices. We learn of inquiries for large quantities for export, but it appears that as yet Europeans are not ready to pay the prices that are asked. We quote St. Louis 4.05c., New York 4.20c.

The European market is higher, good ordinaries being quoted at £19, specials 5s. higher.

Silesian Spelter Market.—The circular of Paul Speier, under date of Breslau, October 29th, quotes good ordinary brands of spelter at 38 @ 38.75 marks per 100 kgs., f. o. b. cars at Breslau. This is equivalent to 4.10 @ 4.18c. per lb., or very nearly on a parity with New York. The large exports from the United States are attracting much attention in Germany. Sales of Silesian zinc abroad continue good, Austria, Great Britain, Japan and Holland increasing their orders, while there has been a decrease this year in sales to Russia and France.

Antimony.—There is no change. We quote Cookson's at 10c.; Hallett's at 9 1/2c.; U. S. Star at 9 1/4c.

Nickel.—The price continues firm at 50 @ 60c. per lb., according to size and terms of order.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

Aluminum.	Per lb.	Ferro Titanium (20%)	Per lb.
No. 1, 99% ingots	33 @ 37c.	Ferro-Tungsten (3%)	35c.
No. 2, 90% ingots	31 @ 34c.	Magnesium	\$2.75 @ 2.80
Rolled sheets	42c. up	Manganese (over 99%)	\$1.05
Alum.-bronze	20 @ 23c.	Mangan' Cop. (2% Mn)	32c.
Nickel-alum	33 @ 35c.	Mangan' Cop. (3% Mn)	38c.
Bismuth	42.25	Molybdenum (Best)	\$1.45
Chromium (over 99%)	1.00	Phosphorus	50c.
Copper, red oxide	5c.	American	70c.
Ferro-Molyb'dum (50%)	\$1.00	Tungsten (Best)	92c.
Ferro-Titanium (10%)	90c.		

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

Platinum.—Consumption continues good and prices are strong. For ingot platinum in large quantities \$18.20 per Troy oz. is quoted in New York. In London a recent quotation gives 75s. per ounce, unmanufactured, and 77s. 6d. @ 80s. for

crucibles, etc. This is very nearly on a parity with New York prices.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 72c. per gram.

Quicksilver.—The New York quotation continues unchanged at \$51 per flask for large lots, with \$52.50 @ \$54 asked for small quantities. San Francisco prices are \$48 on local deliveries, and \$43.50 @ \$44 on export orders. The London price is £9 2s. 6d. per flask, with the same price named from second hands.

LATE NEWS.

A dispatch from Ashtabula, O., November 8th, says: "To-day the steamer 'Iroquois' brought to Ashtabula the first iron ore cargo ever shipped from the new mines at Michipicoten, Ontario. Her cargo consisted of 2,456 tons. The mines and harbor of Michipicoten have been opened only within the past 2 years. It is little more than a year since the work of laying the railroad and building the docks there was begun. The 'Iroquois' left Michipicoten on Monday night, and reached here shortly before noon to-day. A duty of 30c. a ton has to be paid on ore coming from Canada."

(From Our Special Correspondent.)

London, England, October 31st.—A considerable amount of interest has been caused this week by the publication of the report of the Consolidated Gold Fields of South Africa for the year ending June 30th last. In spite of an entire suspension of profitable gold mining on the Rand and of a stagnant market for shares in London, the company has been able to show a profit for the year of £264,962. The casual reader of the financial press and some editors also are surprised that there should be any profit at all, but those people with longer memories know that during the latter end of 1899, the tip went round the market to buy South Africans in view of the expected sudden extinction of the South African Republic and the consequent immediate bound up of all gold shares. The Consolidated Gold Fields, like other controlling and selling houses, reaped considerable profit at the time by this policy and the appearance of a profit on the balance sheet is therefore only to be expected. With the wisdom that comes of experience, the market now knows that the expected rise has not yet come, and with the war dragging on its existence in a series of guerilla encounters, the public are not so inclined to accept the unloading offers of the issuing houses. The Consolidated Gold Fields do not intend to pay any dividend, and as no distribution of profits was made for the preceding year, the accumulated profits amount to over £1,750,000. It is certainly the best policy to keep these funds in hand for the present, until the state of South Africa is more settled.

The markets have once more been extremely quiet this week. There have been no doings in South Africans or West Australians. As, however, all the great ones of the City have come back from their holidays we may expect rather more activity, even if it only arises from the publication of the customary yearly reports, which will flood the City from now until Christmas. I do not hear of many new flotations being arranged for and in all probability the new companies issued will be few.

The shares of Stratton's Independence, Limited, continue to hold their own in the market in spite of the unfounded bear rumors that I referred to a few weeks ago. The sixth dividend at the rate of 40% per annum has been declared, which means a total distribution of £566,670 since the formation of the company in May, 1899. The report for the first 14 months of the company's doings, up to June 30th last, will be circulated shortly and the meeting is to take place next month, when Mr. T. A. Rickard will have an opportunity of describing the present state of the mine and the progress of development. The balance sheet for the period named has been published. These accounts show one point that has apparently so far escaped notice, that of the capital of the company only 1,000,000 shares of £1 each were allotted, and that the remaining 100,000 shares have not been issued. It will be remembered that £1,000,000 in fully paid shares was the purchase price and that according to the prospectus the other 100,000 shares were to provide additional working capital. It was also mentioned that subscriptions for these 100,000 shares were guaranteed at the time of issue. It would therefore appear that no additional working capital has as yet been required, but that the issue is being held over for some more suitable time. It is a curious fact that the reference books state that the whole capital, £1,100,000, has been issued and is fully called up, and are thus not in harmony with the balance sheet. During the period named the sales of ore realized £583,044 net, while the total expenses were about £100,000; this large proportional profit being, of course, due to the fact that the ore averaged nearly 4 oz. per ton. Fuller details of the mining will appear with Mr. Rickard's report.



CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 570.)

New York. Nov. 9.

Heavy Chemicals.—Continue firm. Some domestic makers being well sold up for next year's delivery, have withdrawn from the market. More 1901 contracts were closed this week for domestic high test alkali at 75c. per 100 lbs. f. o. b. works, and of caustic soda at \$1.75 per 100 lbs., f. o. b. works. Sal soda is in better request, and a few sales are reported f. o. b. works at 60c. per 100 lbs. Bicarb. soda also shows an improved demand. Bleaching powder for next year's delivery shows some large orders at prices not yet announced, though it is believed they were taken around \$1.87½ per 100 lbs. Chlorate of potash is stronger, and a good trade over 1901 is announced at about \$8.50 per 100 lbs. f. o. b. works. The Castner-Kellner Alkali Company, of England, has declared an interim dividend at a rate of £8 per cent. per annum for the six months ending September 30th, on both its own shares and those of the Aluminum Company.

We quote per 100 lbs. as follows: Domestic soda ash in bulk is worth 2¼c. per 100 lbs. less than quotations below:

Articles.	Domestic.		Foreign.
	F.o.b. Works.	In New York	In New York.
Alkali, 58% 48%	70@75 75@80		
Caustic Soda, high test..... powd 60% 70@71½ 98%	\$1.70@1.75	2.75@3.00 2.85@3.25 3.25@3.50	3.75@4.00
Sal Soda "conc. 1.12½@1.75 Bicarb. Soda.. 1.12½@1.25 " " extra 3.25@3.50	60@70	65@67½ 1.75	1.75@2.00
Bleach Pdr., Eng. prime..... other brnds..... Chl. Pot. cryst powd.....		1.87½@2.00 1.62½@1.75 8.50@8.75 8.75@9.00	9.50@9.75 9.75@10.00

Acids.—Acetic acid for 1901 delivery was further contracted for. Sulphuric and muriatic acids are in better request. Oxalic prices are firm and an advance is talked of on 1901 business. Blue vitriol is strong, owing to the steady price of copper.

Quotations as below are for large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified.

Acetic, No 8 in lbs. ....	\$1.62½	Nitric, 36° .....	\$3.57½
Blue Vitriol, 5.25@5.50		Nitric, 38° .....	4.12½
Aqua Fortis, 36° .....	3.62½	Nitric, 40° .....	4.37
Aqua Fortis, 38° .....	3.87½	Nitric, 42° .....	4.75
Aqua Fortis, 40° .....	4.12½	Oxalic .....	6.00@6.50
Aqua Fortis, 42° .....	4.50	Sulphuric, 66° .....	1.20
Muriatic, 18° .....	1.20	Sulphuric, 60° .....	1.00
Muriatic, 20° .....	1.35	" bulk 50° ton .....	14.00
Muriatic 22° .....	1.50		

Brimstone.—Demand is better, but spot supplies are scarce, as there were no arrivals this week. Best unmixed seconds on spot are nominal at \$23 per long ton, while shipments are worth \$20.65@21. Best thirds are \$18.75 per ton. Sicilian shipments to all countries in the 9 months ending September 30th were 418,110 long tons. The stocks in Sicily on October 1st were 220,643 tons, against 237,963 tons last year; decrease of 17,320 tons.

Pyrites.—Continued better demand from acid makers, as fertilizer concerns are putting in supplies for the spring season. No imports at New York this week. Prices are unchanged as below: Mineral City, Va., lump ore (basis 42%), \$4.75 per long ton and fines \$4.20. Charlemon, Mass., lump, \$5.50, and fines \$5. Spanish pyrites, 12@14c. as to percentage of sulphur contents, delivered ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46@51% of sulphur; American from 42@44%.

Fertilizing Chemicals.—Leading ammoniates show only a moderate business, as users have enough stock on hand for this year at least. Packers report that they are well sold up, and so are holding for better prices.

Sulphate of ammonia, gas liquor, has reacted, and is quoted at \$2.75@2.80 per 100 lbs. High-grade Western blood is worth \$2.15@2.20 per unit, f. o. b. Chicago; tankage, 9@20%, \$1.95 and 10c. per unit, f. o. b. Chicago; Calcutta bone-meal, \$23 for regular and \$20 per ton for poorer grades; domestic steam ground bone, \$18@18.50 per ton.

Nitrate of Soda.—The market is stronger, at \$1.82½@1.85 per 100 lbs. for all positions. Importers are not anxious sellers, expecting higher prices. Consumers, on the other hand, have bought little during the past week. Arrivals this week were the "Kelvindale" with 32,914 bags at New York, and the "Bellalisa" with 35,700 bags at Baltimore. Freight from Chile per sailing vessel are 33s. 9d. (\$8.10) and steamers 35s. (\$8.40). The exports from Chile in the 12 months ending October 1st are 75,000 tons less than 1898-99, but the world's consumption has increased 20,000 tons over 1898-99. This sit-

uation in itself, say importers, warrants higher prices for nitrate of soda. The Santiago Nitrate Company, Limited, has declared a final dividend for the year ending June 30th last of 10s. per share, which makes 16s. for that year, leaving £3,358 (\$16,790) to be carried forward. The London Nitrate Company, Limited, has declared a dividend of 8s. per preferred share, and 8s. per ordinary share.

Salt-peter.—United States imports in the 10 months ending October 31st are reported at 47,280 bags, against 54,545 bags last year; a decrease of 7,255 bags in 1900. Nearby arrivals are estimated at 3,214 bags and stocks in New York at 6,500 bags, making the visible supply on November 1st, 9,714 bags, against 11,915 bags at the same time in 1899; a decrease of 2,201 bags. Deliveries in New York and Boston in the 10 months of the present year were 45,580 bags, showing a decrease as compared with last year of 5,165 bags. Prices current are \$3.25 per 100 lbs. for shipments of crude, and \$3.62½ for spot; as against \$3.50 and \$3.70 in 1899. Refined is quoted at \$4.25@5.25.

Messrs. Mortimer & Wisner's monthly statement of nitrate of soda, dated New York, November 1st, gives the following statistics:

	1900.	1899.	1898.
	Bags	Bags.	Bags.
Imp. into Atlantic ports from West Coast S. A., from Jan. 1, 1900, to date.	921,707	789,954	817,159
Imp. from Jan. 1 from Europe .....	2,963		55,171
	923,770	789,954	872,330
Stock in store and afloat Nov. 1, 1900, in New York	6,898	9,671	115,679
Boston.....			
Philadelphia.....		33,600	
Baltimore.....	500	10,000	
Norfolk, Va.....			
Charleston.....			
To arrive, due Feb. 15, 1901.	471,300	278,000	232,000
Vis. supply to Feb 15, 1901.	478,698	341,271	347,609
Stock on hand Jan. 1.....	9,585	58,406	15,383
Deliveries past month .....	128,630	112,757	99,574
Deliveries since Jan. 1 to date .....	525,958	795,089	772,104
Total yearly deliveries.....		976,592	967,525
Prices current, Nov. 1 .....	\$1.82½	\$1.70	\$1.55

Phosphates.—Florida miners are stocking up in anticipation of an improved spring demand. In Tennessee rock is selling at lower prices, owing in part to the anxiety of some miners to get rid of their product so as to mine fresh rock for the spring trade. South Carolina miners report a moderate demand at practically unchanged prices.

The shipments of high-grade Florida phosphate rock in the 9 months ending September 30th are reported to us by Messrs. Auchincloss Brothers, as below, in long tons:

Destination.	1898.	1899.	1900.
Continental ports .....	163,110	223,765	160,805
Baltic ports .....	82,994	99,226	88,325
United Kingdom ports.....	25,762	26,144	22,541
Mediterranean ports.....	19,771	5,699	3,852
Japan and Australia.....	1,707	3,250	1,660
United States .....	1,935	2,423	.....
Total tons .....	286,279	360,507	277,184

The falling off thus far this year amounts to 83,323 tons, or 23%, as compared with 1899, and 9,995 tons, or 3%, less than 1898.

In October shipments of high-grade Florida rock from Savannah amounted to 7,660 long tons, making 93,357 tons for the 10 months, as against 77,180 tons in the corresponding period last year, showing an increase of 16,177 tons in 1900.

Phosphates	Per Ton F. o. b.	C. I. f. Un'd Kingdom or European Ports.	
		Unit.	Long ton.
* Fla. hard rock (77 @ 80%)	\$7.50@8.00	8½@8¾d	\$13.26@13.66
* Fla. land pebble (63 @ 73%)	4.35	7¼@7¾d	10.50@10.85
* Fla. Peace River (58 @ 63%)	3.00@3.50	6¾@7¼d	7.50@9.00
† Tenn. rock 78%, export.	3.50@3.75	7¼@7¾d	11.70@12.09
† Tenn. .... 78% domestic.	3.00@3.50		
† Tenn. .... 75%	2.75@3.00		
† Tenn. .... 72%	2.25@2.65		
‡ So. Car. rock, crude.....	4.00		
‡ So. Car. rock, dried.....	4.50	6¾d	8.10
Algerian, rock..... (63 @ 71%)		7@7¼d	9.33@10.05
Algerian, rock..... (58 @ 63%)		6¾@7¼d	8.10@8.70

\* Ferdinandina. † Mt. Pleasant. ‡ At mines. § On vessels, Ashly River.

In Algeria storms and hurricanes at Tebessa have necessitated the closing of some of the mines, notably those of the Societe Francaise, and it will be some time before shipments can be resumed.

On November 23d the phosphate deposits of Kalaa-es-Senam (containing about 3,840,000 met-

ric tons phosphates) and those of Kalaa-Rebiba (1,920,000 tons), in Tunis, North Africa, will be sold at auction. These deposits contain from 69 to 70% bone phosphate of lime, and it is claimed carry less than 1% iron and alumina. The conditions for the auction stipulate that the tenders must refer to the royalty to be paid to the government per ton shipped in excess of the general export tax of 50 centimes per ton.

Liverpool. Oct. 30.

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

In heavy chemicals the transactions reported are still chiefly for 1901 delivery, while on the spot there is not much activity, although at the same time the market is in a firm position all round. Soda ash is well controlled by makers and prices of Leblanc ash for export have been further advanced. We quote spot range for tierces about as follows: Leblanc ash, 48%, £5 10s. @ £5 15s.; 58%, £6 @ £6 5s. per ton, net cash. Ammonia ash, 48%, £4 10s. @ £4 15s.; 58%, £4 15s. @ £5 per ton, net cash. Bags, 5s. per ton under price for tierces. Soda crystals are in fair request at £3 7s. 6d. per ton, less 5% for barrels, or 7s. less for bags, with special terms for certain favored markets. Caustic soda is in good demand for the East and there is a moderate inquiry from other quarters. Quotations are very firm, as follows: 60%, £9 5s.; 70%, £10 5s.; 74%, £10 15s. @ £10 17s. 6d.; 76%, £11 5s. @ £11 10s. per ton, net cash.

Bleaching powder is steady at £6 5s. @ £6 10s. per ton, net cash, for hardwood, but the export demand is rather light.

Chlorate of potash is unchanged at 3¼d. per lb. net cash.

Bicarb. soda is still held for £6 15s. per ton, less 2½% for the finest quality in 1 cwt. kegs, with usual allowances for larger packages; also special terms for certain export quarters.

Sulphate of ammonia is quiet, but holders still demand £11 2s. 6d @ £11 5s. per ton, less 2½% for good gray 24@25% in double bags f. o. b. here.

Nitrate of soda is firmer, owing to the combination on the West Coast having been arranged. On the spot £8 10s. @ £8 15s. per ton, less 2½%, is now quoted for double bags f. o. b. here, as to quality, but there is not much going on.

MINING STOCKS.

Complete quotations will be found on pages 567 and 568 of mining stocks listed and dealt in at:

Boston.	Philadelphia.	Montreal.
Colo. Springs.	Salt Lake.	London.
Denver.	San Francisco.	Mexico.
New York.	Spokane.	Paris.
	Toronto.	

New York. Nov. 9.

The copper shares are "bullish" in consequence of certain Boston interests wanting to buy. It seems these efforts are initiated with the view of supporting the projected boom in Boston. Thus Amalgamated rose on sales from \$93¼ to \$96 early in the week, and notwithstanding the purchase of "calls" for thousands of shares at \$100 on Monday good for the rest of the week, the market fell to \$94¼ on Thursday. Anaconda shows increased trading, selling up to \$49¼ on Thursday. On the same day a 500-share lot of British Columbia brought \$17¼ per share, which is a gain of nearly 3 points since last week. Union of North Carolina is not active, and the few sales reported at \$3@3¼ were made apparently among insiders. A sale of Markeen Copper, of Arizona, was reported on curb at \$1.50, which is several points less than was last quoted for it.

The Colorado stocks showed a limited trading, and in the California group Quicksilver preferred sold at \$8.75. The Comstock shares have been weakened by a new lot of assessments.

Standard Oil shares soared after Election day, selling on Wednesday at \$650, the highest point on record. But when the company announced only a \$10 quarterly dividend speculators showed much disappointment, and as a result the stock fell 40 points to \$610. Later, however, the stock recovered to \$625. With this \$10 dividend the company will have paid out this year \$48 per share, amounting to \$46,800,000 on its outstanding share capital. The total dividend disbursements of the present New Jersey company since its organization in June, 1899, amount to \$75 per share, or \$73,125,000.

Boston. Nov. 7.

(From Our Special Correspondent.)

The chief feature of the early part of the week has been the heavy sales of Boston & Montana stock. The trading in this stock has been quite large for two or three weeks past, but in two days—November 1st and 2d—the sales rose to nearly 16,000 shares. From October 15th to November 3d the sales were nearly 30,000 shares. The price varied during that time between \$315 and \$341, but the large blocks were sold chiefly around \$320.

The meaning of all these sales has not been clear to the public mind, and the general impression has been that they were only intended

to amuse the public until the boom was ready to be launched.

Thomas W. Lawson at the same time began his work of issuing a bull manifesto. The public has a short memory, unfortunately, and there is always a new crop of fools ready to listen to lies, so that such fellows as this always command some audience.

To-day the boom was fairly started, with higher prices and very active trading. The blind pool stocks had most of the business. It is an inside boom so far, the public not being quite ready, notwithstanding the election is over.

In the group named Boston & Montana sold for \$330; Butte & Boston, \$71; Parrot, \$49½; Anaconda, \$48½; Arcadian, \$18. Among other coppers Calumet & Hecla was quoted at \$800; Tamarack, \$270; Quincy, \$162; Osceola, \$74; Wolverine, \$45; Utah, \$34½; Atlantic, \$26; Baltic, \$24½ @ \$25. The small coppers were out in some force, showing more business than for nearly a year past.

The gold stocks were a little slow to feel the impulse, and there were fewer dealings than in the coppers. In the general list United States Oil was quoted at \$14, while Dominion Coal brought \$41 and New England Gas and Coke \$13½ @ \$14.

We shall see what we shall see, but it looks now as if we should have a boom of some dimensions, with the doubtful influences on top.

The quicksilver stocks have been neglected for some time past, and only an occasional sale is recorded.

Everyone is looking forward to a big rise in stocks next month and an active market. While it will please me to see plenty of business, I have my doubts as to the extent of the movement. But we shall see.

**Colorado Springs, Nov. 3.**

(From Our Special Correspondent.)

The markets quieted down considerably the latter part of the week. Despite the improvement which was so marked a feature last week, stocks have had a struggle to hold their own.

For the first time in months, however, the local market begins to show a sign of leadership which has manifested itself in the pushing up of a group of securities commonly styled the Beacon Hill stocks, because of the location of the mines. The clique that attempted the move is composed of a number of the more venture-some speculators and the advance has been maintained.

Elkton made a steady gain from \$1.84½ to \$1.89½, the latter being to-day's closing figure. The report that the Portland Mine is being sought by London mining men grows. The stock was strong from \$3.35 to \$3.40 during the entire week. The selling price of Isabella shares has steadily decreased from 90 to 85c., at which point the stock closed to-day. It is announced from New York that the Last Dollar Gold Mining Company has resumed dividends and will pay 2c. a share. The amount will be \$30,000. This is the third dividend of the company and brings the total disbursements up to \$90,000. The week among the banking houses has been quite prosperous and the clearings show an increase of \$150,000 over a week ago and reach a total of \$940,760.

**Los Angeles, Cal., Nov. 3.**

(From Our Special Correspondent.)

Development work in the California oil fields during October shows a considerable increase in new wells. No new fields were opened, but the progress in several districts is encouraging. From Humboldt County, on the extreme northern boundary of the State, come reports of renewed search for petroleum. The pioneer well there was put down 1,700 ft., when the operators were compelled to cease drilling on account of a lost string of tools. Another well will be sunk to exploit the oil horizon. Work is under way in Napa County, near the center of the State. In San Diego County at the State's southern limit, two companies have wells drilling. The deepest is reported down 970 ft., when the oil sand was penetrated. For several weeks work has been suspended owing to lost tools in the hole, but will be resumed in a few days.

The Kern River fields and Sunset district have added new wells to their list of producers. At McKittrick considerable interest centers over recent developments.

The Standard Oil Company will shortly erect 10 3,500-bbl. storage tanks at Bakersfield near the Kern River District.

One of the most important recent strikes is in the San Fernando Valley in Los Angeles County.

Oil securities have seen no material change this week. Prices are bearish, with a slightly stronger tendency, particularly in substantial companies. Many new ventures that are well backed find local capital with which to operate.

**Salt Lake City, Nov. 3.**

(From Our Special Correspondent.)

On the whole the Utah mining share market held up encouragingly for the week prior to election, when, as was to be expected, outside orders dropped away to the low-water line. Total sales of record on the Exchange are re-

ported as 87,807 shares, which sold for \$42,449, compared to 68,686 shares sold the prior week for \$41,872.

Daly-West has once more supplied the pleasant surprise, steadily advancing from \$20.19 on October 27th to \$22.75, at which it sold to-day, though softening a shade at the close. At the other end of the string Yankee Consolidated has shown the greatest slump, to \$3, on the demonstration that the ore body, from which recent shipments were made, is in May Day territory, which has occasioned considerable friction and a lively flow of language.

Ajax has moved up, with excellent demand. There is better inside support. Bullion-Beck refuses to remain down. Consolidated Mercur rules around \$4.50. A report is afloat that there is an option out on Captain De La Mar's holdings. Dexter stands at \$1. It is said that nearly all the 100,000 treasury shares of the new company are subscribed for at \$1, which will square all outstanding debts. Eagle and Blue Bell sold up to 97½.

Geyser-Marion is rarely quoted these days. The sale under the judgment occurs November 8th and a plan is talked of to buy it in for the benefit of the shareholders, or those who care to participate in trying to adjust matters. Sacramento did business around 33, with a good demand.

Rocco-Homestake-Nevada, a California company, is a new one on the list. The mines are near Eureka, Nevada, and the capitalization is \$300,000 in \$1 shares. First sales were at 60c., and the next day a dividend of 1½c. per share was declared and the shares moved up to 64½c.

**San Francisco, Nov. 3.**

(From Our Special Correspondent.)

The Gould & Curry mill business still hangs fire and the news from the Comstock was uninteresting. The market has been flat and generally weak.

Some prices noted are: Consolidated California & Virginia, \$1; Ophir, 76c.; Gould & Curry, 7c.; Caledonia, 33c.; Mexican, 31c.; Hale & Norcross, 27c.; Yellow Jacket, 17c.

The Chollar Mining Company has levied an assessment of 10c. a share, delinquent December 6th.

The sales on regular call at the San Francisco Stock Exchange for the year to date compare as follows:

	1899.	1900.
January, shares.....	171,955	164,400
February.....	350,860	112,000
March.....	272,625	252,730
April.....	209,215	121,500
May.....	164,580	171,075
June.....	201,375	129,505
July.....	147,340	84,110
August.....	153,305	163,985
September.....	136,865	113,350
October.....	168,770	229,790
<b>Total.....</b>	<b>1,826,890</b>	<b>1,542,385</b>

October made a better showing than any month this year except March.

Business on the Oil Exchange was good. Home Oil brought \$4.50; Twenty-eight, \$2.10; Monte Cristo, \$1.20 @ \$1.25; Four Oil, 40c.

The greatest interest just now in the developments in the Kern Region, which promise well, and have much speculative interest.

**London, Oct. 30.**

(From Our Special Correspondent.)

A somewhat remarkable departure of the Tasmanian Government has been attracting the attention of mining circles lately. This action is to provide funds for the sinking of an exploratory shaft at the Mangana Company's property. This property consists of massive quartz of low gold contents, but the Government thinks it promises so well with depth that it has offered to provide half the cost of sinking from 500 ft. to 600 ft.; 60% of the cost from 600 ft. to 700 ft., and two-thirds of the cost at any level below 700 ft. The governments of various countries encourage mining operations in various ways, such as the building of roads, water supply, etc., but it has not hitherto been customary to spend public money in prospecting or in developing individual properties. It is done in Rhodesia by the Chartered Company, but this company is a trading concern as well as a government. It would be interesting to know of similar instances. The action of the Tasmanian Government in singling out a particular property is causing some jealousy and ill feeling among people claiming stronger reasons for public assistance.

**Paris, Oct. 28.**

(From Our Special Correspondent.)

The coal question is giving us some trouble and promises to be a serious one this winter in Paris. Fuel is almost a luxury now, and one does not like to think of what may be before the winter is over.

An official return just published shows that in our Asiatic colony of Tonkin from the declaration of the mining law in 1888 up to June 30th, 1900, there were granted 374 permits to prospect for minerals. Of these 299 had been surrendered or permitted to lapse, and there remained 75

concessions on which prospecting or actual mining was going on. Of these concessions, 27 were for coal mines, 9 for iron ore, 7 for gold, 3 each for copper, for silver-lead and for cinnabar, 2 each for gold and silver, for silver alone and for all metals. The remaining 17 include concessions for antimony, for zinc, for graphite, for petroleum and for saltpeter. There were 49 concessions granted for quarries, of which 47 are now in force. These workings include limestone, dolomite, sandstone, marble and clay. No statistics are given of production, and it does not appear that any metals have been actually produced in quantity, the only tangible result being a certain quantity of coal. Most of the coal mined in Tonkin, while of fair quality, is very friable and will not stand handling or transportation unless it is made into briquettes.

This report does not show a gratifying result for a colony reported to be rich in minerals. There is an absence of enterprise, of disposition to exploit the wealth of the country which is disappointing.

The trouble is, as with most of our colonies, that our people will not go there—and the rule of the bureau crushes enterprise. Azote.

**DIVIDENDS.**

NAME OF COMPANY.	Latest Dividend.			Total to date.
	Date.	Per share.	Total.	
Adams, Colo.....	Nov. 15	\$.05	\$7,500	\$701,000
†Bethlehem Steel, Pa.,	Dec. 1	.50	150,000	1,050,000
†Boston Gold Cop.Sm.,	Nov. 15	.02½	25,000	50,000
Boston & Mont. Con.,	Nov. 20	15.00	2,250,000	20,750,000
*Bunker H. & Sull., Ida	Nov. 5	.07	21,000	1,032,000
Cambria Steel, Pa.,	Nov. 15	.50	160,000	1,600,000
*Empire State, Ida.,	Nov. 15	.30	29,554	643,133
Last Dollar, Cal.,	Nov. 21	.02	30,000	120,000
Lehigh Coal & Nav'n	Nov. 27	1.50	439,995	14,321,148
†National Tube, com.,	Nov. 15	1.50	600,000	1,200,000
Rocco-Homestake, Nev	Nov. 10	.01½	4,500	4,500
*Silver King, Utah.,	Nov. 10	.50	75,000	3,275,000
*Smuggler, Colo.,	Nov. 15	.03	30,000	1,700,000
Standard Con., Cal.,	Nov. 22	.10	20,000	3,979,326
Standard Oil (new),	Dec. 15	10.00	9,750,000	73,125,000
*Swansea, Utah.....	Nov. 10	.05	5,000	291,500

\* Monthly. † Quarterly. ‡ Semi-annual.

**ASSESSMENTS.**

NAME OF COMPANY.	Loca- tion.	No	Delinq.	Sale.	Amt.
Belcher.....	Neu.	66	Nov. 13	Dec. 4	.10
Ben Butler.....	Utah	6	Nov. 16	Dec. 6	.00½
Bingham Placer.....	Utah		Oct. 16	Nov. 17	.10
Bullion.....	Neu.	57	Nov. 15	Dec. 5	.03
California Borax.....	Cal.		Nov. 19		.75
Con. Cal. & Va.....	Neu.	16	Dec. 10	Dec. 10	.25
Challenge, Con.....	Neu.	30	Nov. 20	Dec. 11	.10
Crown Point.....	Neu.	80	Nov. 30	Dec. 21	.05
El Key.....	Utah	2	Dec. 4	Dec. 21	.03
Eureka Con. Drift.....	Cal.		Nov. 13		.01
Fish Springs.....	Utah		Oct. 15	Nov. 3	.01
Goleta, Con.....	Cal.	2	Oct. 25	Nov. 24	.15
Gonyon.....	Utah		Dec. 1	Jan. 2	.00½
Gould & Curry.....	Neu.	92	Nov. 28	Nov. 29	.15
Grape Vine Canyon.....	Cal.	3	Oct. 3	Nov. 14	.07
Jefferson.....	Utah	1	Nov. 20	Dec. 10	.00½
Joe Bowers Ext.....	Utah	9	Oct. 26	Nov. 15	.01
Mariana's Mariscano	Cal.	24	Oct. 23	Nov. 12	.02
Mayflower.....	Utah	2	Oct. 24	Nov. 15	.04½
Mazepa.....	Cal.	2	Nov. 17		.02
Meteor.....	Utah		Oct. 19	Nov. 21	.00½
North Bonanza.....	Neu.	12	Nov. 1	Nov. 15	.15
Old Colony & Eureka.	Utah	1	Nov. 13	Nov. 29	.00½
Osceola Con.....	Cal.	10	Nov. 19	Dec. 10	.01
Phoenix Silver.....	Utah		Nov. 13	Dec. 13	.01½
Potosi.....	Neu.	57	Nov. 22	Dec. 12	.10
Ridge & Valley.....	Utah	1	Nov. 3	Nov. 19	.01
Scorpion.....	Neu.	8	Oct. 26	Nov. 19	.03
Seg. Belcher & Mides.	Neu.	26	Nov. 7	Nov. 27	.03
Sierra Nevada.....	Neu.	120	Nov. 20	Dec. 10	.15
Sonora.....	Cal.		Oct. 3	Nov. 13	.01
South Bingham.....	Utah	2	Nov. 1	Nov. 30	.01
Spanish Bar.....	Cal.		Nov. 24		.01
Star.....	Utah		Nov. 7	Nov. 28	.02
Tetro.....	Utah	15	Oct. 17	Nov. 10	.01
Texas.....	Cal.		Dec. 18		.10
Valeo.....	Utah	4	Nov. 22	Dec. 15	.5
Wandering Jew.....	Utah	5	Nov. 17	Dec. 5	.00½
Yellow Jacket.....	Neu.		Nov. 6	Dec. 19	.10

**ANNUAL MEETINGS.**

Name of Co.	Locat'n.	Date.	Place of Meeting.
Challenge Con	Neu.....	Nov. 17	San Francisco, Cal.
Confidence.....	Neu.....	Nov. 12	San Francisco, Cal.
Cripple C. Con.,	Colo.....	Dec. 7	Denver, Colo.
*Dexter.....	Neu.....	Nov. 15	Salt Lake City, Utah
*Holmes.....	Neu.....	Dec. 19	San Francisco, Cal.
Ida May.....	Colo.....	Nov. 28	Colorado Spgs., Colo.
Mexican.....	Neu.....	Dec. 5	San Francisco, Cal.
N. Y. & Hond. R.	C. Am.	Dec. 14	15 Broadway, N. Y.
Occidental Con	Neu.....	Nov. 30	San Francisco, Cal.
*Sterl'g W. Lead	Pa.....	Jan. 15	Pittsburg, Pa.
*Tuscarora.....	Neu.....	Nov. 15	Salt Lake City, Utah

\*Special meeting.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Alice, Amalgamated, Anaconda, and others with columns for location, par value, and sales.

BOSTON, MASS.

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

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing companies like Am. Sm. & Ref., Am. S. & W. Con., and others with columns for location, par value, and sales.

\* Holiday. Total sales, 345,125.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, Pa., listing companies like Am. Alkali, Am. Cement, Bethlehem Iron, and others with columns for location, par value, and sales.

Total shares sold, 25,000. Reported by Townsend, Whelen & Co., 809 Walnut St., Philadelphia. Ex-Dividend. Holiday.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, Cal., listing companies like Belcher, Best & Belcher, Caledonia, and others with columns for location, par value, and sales.

\* Holiday.

CALIFORNIA OIL STOCKS.

Table of California oil stock quotations, listing companies like Blue Goose, Buckhorn, Home, and others with columns for location, par value, and sales.

\* California and Producers Oil Exchanges. Total sales, 4,500 shares.

SALT LAKE CITY, UTAH.

Nov. 3.

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Alice, Bullion-Beck & Ch., and others with columns for shares, par value, bid, and asked.

TORONTO, ONT.

Table of stock quotations for Toronto, Ont., listing companies like Ontario, Golden Star, Ham Ref., and others with columns for location, par value, and sales.

Total shares sold, 139,525.

SPOKANE, WASH.

Table of stock quotations for Spokane, Wash., listing companies like Crystal, Deer Trail Con., Gold Legend, and others with columns for location, par value, and sales.

\* Official quotations Boston Stock Exchange. † Ex-Dividend. Total sales, 34,272 shares.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing companies like Acacia, Alamo, Am. Con., Anaconda, Anchor, etc., with columns for Par. val., dates (Oct. 27, Oct. 29, Oct. 30, Oct. 31, Nov. 1, Nov. 2), and Sales.

Colorado Springs Mining Stock Exchange. Total sales, 1,216,517 shares.

MONTREAL, CANADA.

Table of stock quotations for Montreal, Canada, listing companies like Big Three, California, Can. Gold Fields, Decca, etc., with columns for Par. val., Week, and Sales.

Montreal Stock Exchange. Total sales, 29,400 shares.

MEXICO.

Table of stock quotations for Mexico, listing companies like Durango, Barradon y Cab., Candelaria de Pan., Capuzaya Guan., etc., with columns for No. of shares, Last div'd., and Prices.

DENVER, COLO.

Table of stock quotations for Denver, Colo., listing companies like Alamo, Anaconda, Dictator, Elkhorn, Findley, etc., with columns for Par. val., dates, and Sales.

Official Quotations Denver Stock Exchange. Total sales, 98,500 shares.

PARIS.

Table of stock quotations for Paris, listing companies like Acleries de Creusot, Boleo, Dynamite Centrale, Esmeralda-Bleyberg, etc., with columns for Country, Product, Capital Stock, Par. val., Latest divs., and Prices.

LONDON

Table of stock quotations for London, listing companies like Alaska Goldfields, Alaska-Mexican, Anaconda, De Lamar, El Oro, Grand Central, etc., with columns for Country, Authorized capital, Par. val., Last dividend, and Quotations.

+ Ex-dividend.

DIVIDENDS.

GOLD, SILVER, COPPER, ZINC, LEAD AND QUICKSILVER COMPANIES.

Table with columns: Number, Name and Location of Company, Authorized Capital Stock, Shares Issued (No., Par Val), Dividends (Paid, 1900, Total to Date, Latest Date, Amt.), and a second set of columns for another group of companies.

COAL, IRON AND OTHER COMPANIES.

Table with columns: Number, Name and Location of Company, Authorized Capital Stock, Shares Issued (No., Par Val), Dividends (Paid, 1900, Total to Date, Latest Date, Amt.), and a second set of columns for another group of companies.

This table is corrected up to October 24th. Correspondents are requested to forward changes or additions.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

Table with multiple columns listing various chemical and mineral products (e.g., Abrasives, Borax, Manganese, Silver) and their current market prices. Includes sub-sections for 'THE RARE ELEMENTS' and 'THE RARE ELEMENTS' with detailed pricing for elements like Barium, Beryllium, and others.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to Sept. 27. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Reviews.