

THE ENGINEERING AND MINING JOURNAL



(Published Every Saturday at 253 Broadway, New York.)

Entered at the Post-Office of New York, N. Y., as Second Class Mail Matter.

VOL. LXX. NOVEMBER 24, 1900. No. 21.

RICHARD P. ROTHWELL, C. E. M. E., Editor.
 ROSSITER W. RAYMOND, Ph. D., M. E., Special Contributor.
 THE SCIENTIFIC PUBLISHING CO., Publishers.

SUBSCRIPTIONS ARE PAYABLE IN ADVANCE. For the United States, Mexico and Canada, \$5 per annum; all other countries in the Postal Union, \$7.

REMITTANCES should be made by bank drafts, post-office orders or express money orders on New York, payable to the Scientific Publishing Co.

When change of address is desired, both old and new address should be sent. NOTICE OF DISCONTINUANCE. The JOURNAL is not discontinued at expiration of subscription, but is sent until an explicit order to stop is received by us. We find that a large majority of our subscribers prefer not to have their subscriptions interrupted and their files broken in case they fail to remit before expiration. It is therefore assumed, unless notification to discontinue is received, and the amount of back subscription paid to date, that the subscriber wishes no interruption in his series. PAPERS RETURNED ARE NOT NOTICE OF DISCONTINUANCE.

Main Office: 253 Broadway (P. O. Box 1833), NEW YORK.

Telephone Number, 3,085 Cortlandt.

New York Cable Address—"ROTHWELL." (Use McNeill's or A B C 4th Edition Code.)
 London Cable Address—"PULCINETTO."

Branch Offices: Chicago, Ill 737 Monadnock Building, Phone 73 Harrison.
 Denver, Colo., Boston Building, Room 206.
 Salt Lake City, Utah, Atlas Building.
 San Francisco, Cal., Third Floor, Mills Building.
 Vancouver, B. C., Office, Molson's Bank Bldg. Wm. M. Brewer, Manager.
 London, Eng., Office, 20 Bucklersbury, 368. E. Walker, Manager.

English subscriptions to the JOURNAL may be paid at the London Office at the rate of \$7 = £1 8s. 9d.; the publications of the Scientific Publishing Company may be bought at the rate of 4s. 2d. to the dollar, net.

CONTENTS.

Editorial Notes	601
Silver Shipments to the East	602
California Petroleum	602
New Publications	602
Books Received	603
Correspondence	603
Taper Discharges for Fans	604
The Electric Plant at Desloge, Missouri	604
* The Cripple Creek District, Colorado—IV S. F. Hazlehurst	605
* The Preservation of Timber Octave Chanute	606
* The Sturtevant Exhaust Head	607
* The Theisen Centrifugal Purifier for Blast Furnace Gases	607
Recent Decisions Affecting the Mining Industries	607
Fatal Accidents in Coal Mining in North America F. L. Hoffman	608
* Obtaining Volume of Small Drifts and Working Places C. S. Herzig	610
* The Gates Tilting Cradle and Hot-Ore Well	609
Abstracts of Official Reports	610
The T-luride Ores of Cripple Creek and Kalgoorlie T. A. Rickard	611
* The Crane Company Exhibit at the Paris Exposition	612
A Michigan Coal Mine	612
New Iron Industries in Russia	613
Mineral Collectors' and Prospectors' Column	613
Questions and Answers	613
* Patents Relating to Mining and Metallurgy	614

Personal 615	South Dakota 620	New York 623	London 626
Obituary 615	Texas 620	Cartagena 623	Paris 626
Societies and Technical Schools 615	Utah 620	Gold and Silver Prices, Statistics, Imports and Exports 623	Meetings 626
Industrial Notes 615	Washington 620	Foreign Coins 623	Dividends 626
Trade Catalogues 616	Wyoming 620	Copper 624	Assessments 626
Machinery and Supplies 616	Foreign Markets:	Tin 624	Stock Quotations:
Mining News.	Coal:	Lead 624	New York 627
United States:	New York 621	Spelter 624	San Francisco 627
Arizona 616	Birmingham 621	Antimony 624	Boston 627
California 616	Chicago 621	Nickel 624	Philadelphia 627
Colorado 617	Cleveland 621	Platinum 624	Toronto 627
Georgia 618	Pittsburg 621	Quicksilver 624	Salt Lake City 627
Idaho 618	Shanghai 621	Minor Metals 624	Spokane 628
Indiana 618	Foreign Coal Market 621	Chemicals and Minerals:	Colorado Springs 628
Michigan 618	State:	New York 625	Montreal 628
Missouri 618	New York 621	Liverpool 625	Mexico 628
Montana 619	Metals	Messina, Sicily 625	Denver 628
Nevada 619	Iron:	Market Reviews:	Paris 629
New Mexico 619	Pig Iron Production 622	New York 625	London 629
North Carolina 619	Birmingham 622	Boston 625	Current Prices:
Oregon 619	Buffalo 622	Salt Lake City 626	Minerals, Chemicals, etc. 630
Pennsylvania 619	Chicago 622	San Francisco 626	Alphabetical Index to Advertisers Page 20
Classified List of Advertisers Pages 14, 15, 16, 17, 18	Cleveland 622		
	Philadelphia 622		
	Pittsburg 622		

Petroleum production in Galicia seems to be exceeding the demand. The latest advices are that some of the refining works have closed down and producers are at a loss as to what they can do with their oil. They are not well placed to command trade, being practically limited for their market to Austria-Hungary and a small part of Germany. Everywhere else the competition of Russian and American oil must be met, with the disadvantages of heavy freight charges. The development of the field has gone on faster than the opening of its markets, with the consequences indicated above.

The exploitation of the Michigan coal basin, as shown by reports recently published in our columns, is proceeding very successfully, and an industry of good proportions has been built up in that State. While comparatively limited in area and not of sufficient extent to compete at any distance with the coal of Ohio or West Virginia, the Michigan mines have a large local coal market which they can well supply. The somewhat greater cost of mining is balanced by the cost of transportation from other fields. Local manufacturing interests have been and will be much benefited by this supply of fuel close at hand.

Although the war in South Africa seemed to be nearly at an end some months ago, the resumption of work at the Witwatersrand mines does not seem to be as close as has been expected or desired by their owners. The defeated Boers seem to be still carrying on a guerilla warfare of a very annoying kind, and until a stop is put to this any general starting up of the mines is unlikely. It was hoped that the actual output of gold could begin with the new year; but even this now seems uncertain. A good deal of preparatory work is going on, however, in the way of repairs and new machinery. When the military occupation is so far relaxed as to permit the general return of workmen to Johannesburg work will proceed very rapidly.

The gold production of the Yukon Region promises to show a considerable gain this year. In 1899 the Canadian Geological Survey put the total amount at \$16,000,000. This year there are, as usual, various estimates, but the most probable, being based on the royalties collected by the Canadian officials at Dawson, puts the total for 1900 at \$20,000,000. The Klondike excitement has largely passed over, but work is being carried on steadily and more carefully. Moreover, transportation facilities have been provided, so that machinery and necessary supplies are obtained at a reasonable rate. In short, operations are gradually settling down to a business basis on which they can be conducted for years to come.

The letter which we published last week on "A Bit of Nome History," appears to have its statements fully confirmed by the testimony given in the Nome cases before the Circuit Court in San Francisco. This shows a state of affairs thoroughly discreditable to all who were engaged in the attempt to seize and work claims at Nome regardless of the rights of their owners. This attempt was largely successful, and it is in an effort to right the wrongs done that the facts are now being brought out in the San Francisco court. There is evident need of a strict investigation by the Department of Justice at Washington. There is also need of a radical improvement in the laws applicable to the territory of Alaska, which should be revised and made clear. Better laws are necessary, as well as better enforcement.

The article on mine accidents, given on another page, deserves very careful reading, since it contains a great deal of information in a condensed form. Mr. F. L. Hoffman, the writer, has made a very careful and thorough study of mine accidents from the point of view of the relative hazard of different occupations, and his conclusions may be accepted as of much value. Mr. Hoffman notes that the death-rate in the coal mines of this country showed an increase last year. This may have been and probably was due to the fact that in almost all parts of the country coal mining was exceedingly active in 1899, and consequently there were probably many new and inexperienced men at work in the mines. This alone would have an unfavorable influence; while the extension of old mines and the opening of new ones was also pushed on a scale which would naturally lead to the neglect of precautions in many cases.

In the "Engineering and Mining Journal," September 9th and November 18th, 1899, we referred at some length to the Basin Gold and Copper Mining Company, of Montana, which was then selling stock in the East on the strength of flaming prospectuses and advertisements. We then stated that the Hope Mine, the company's chief property, was practically worked out, only very low-grade ores being left in what was at one time a valuable mine. The facts were well known to many people

in Montana, and our statements at the time were supported by abundant evidence. Their truth was further established by the closing down of the mine and the drawing of the pumps in January last. We are now informed that the mine and other property have been attached and will shortly be sold to satisfy claims amounting to \$45,261, held by H. L. Frank, of Butte, and M. L. Hewlett, of Basin. These claims are for money advanced and services rendered. Under the sale the property will pass, in all probability, to the claimants, and those who bought stock will be left with nothing whatever to represent it.

A notable instance of the way in which American shops can and will handle an emergency job is shown in the case of a break in the main shaft of the hoisting engine at the Anaconda Mine in Butte, Montana. The mine was crippled, and it was necessary to replace the broken shaft in the shortest possible time. The order for a new shaft was at once given to the Bethlehem Steel Company at South Bethlehem, Pa., and that company agreed to furnish it in 16 days. The shaft is hollow-forged, fluid-compressed steel, 17 ft. 10 in. long, with diameter varying from 15 $\frac{3}{4}$ to 20 in., and with a 7-in. axial hole, the total weight being about 12,000 lbs. The work was taken in hand at once, the forging completed, the machine work done and the shaft shipped in 14 days, or two days less than the contract time. To save time it was sent from Bethlehem to Butte by express, in a special car. We do not believe that such prompt action could be taken or such quick work done in any other country in the world. The new shaft was in place and the engine at work in a time which a German or a British manufacturer would have required to arrange the preliminaries.

We have heretofore referred to the fact that the increase in copper production is necessarily slow, even under the most favorable conditions. This view is confirmed by the returns which have been published monthly for the benefit of the copper producers by Mr. John Stanton, who acts as their statistician. From these statements, which approximate the actual output very closely, we find that in the ten months ending with October the production of fine copper in this country was 223,487 long tons, showing an increase over the corresponding period in 1899 of 8,286 tons, or 3.8 per cent. only. Moreover, in the production of the older mines there was an actual decrease this year of 1,114 tons, or 0.6 per cent.; the gain in the total coming entirely from what are given in the statements as the "outside sources"; that is, from new mines and from ores treated by smelters for gold and silver values chiefly, copper being a by-product. During the same period the production of the European mines was nearly stationary, the total this year being given at 74,096 long tons, or only 112 tons more than in 1899. This shows that the new mines which have been started during the past two years under the influence of the high prices of copper have not, as a rule, entered the producing list; while the old mines which were reopened have done little better. The majority of the old producing mines pushed work last year, and probably found themselves unable to do better this year; while special causes have operated to limit production in one or two important districts.

SILVER SHIPMENTS TO THE EAST.

The feature of the silver market this year has been the heavy demand from the East, which has continued all through the year. The extent of this demand is shown by the following table, which gives the shipments to India and China by way of London and San Francisco, the values being reduced to dollars for ease in comparison:

	1899.	1900.	Increase.
China, from London.....	\$6,796,519	\$10,815,359	\$4,018,840
China, from San Francisco.....	4,992,330	12,625,425	7,633,095
Total China	\$11,788,849	\$23,440,784	\$11,651,935
Japan	500,523	500,523	500,523
British East Indies.....	23,301,936	29,095,980	5,794,044
Totals	\$35,090,785	\$53,037,287	\$17,946,502

Making allowances for the higher average price this year, we find that in 10 months the East has taken approximately 87,670,000 ounces of silver this year. In 1899 the quantity was 59,897,000 ounces, so that this year's shipments show an increase of 27,773,000 ounces, or 46.4 per cent. To the total this year is to be added the silver shipped from Australia direct to China and India. While exact figures for this are not yet available, the quantity can be put approximately at 9,500,000 ounces, bringing the total above given up to 97,170,000 ounces. Now, in 1899 the total production of silver in the world, as given by "The Mineral Industry," Volume VIII, was 174,723,363 ounces. There is no reason to look for any increase this year; and taking the production at the same figures as last year, we find that 66.8 per cent. of the silver produced has gone to the East.

We have heretofore referred to the causes for the increase in demand for silver this year. These are, briefly, the demand for new coinage in

India, which has been forced upon the Indian Government by the necessities of trade in that country; and the disturbed condition of China, which has made it necessary to pay for exports in silver instead of goods, and has also required large expenditures in China itself by European nations. There are several minor causes, one of them being the high price of tin, nearly all of that metal being paid for in silver.

The demand from the East is the chief factor in maintaining the continued high price of silver; and there is every indication that this demand will continue through the short remainder of the year, and extend into 1901.

CALIFORNIA PETROLEUM.

For a number of years past the question of fuel supply has been an important one in California. The coal supplies so far developed in the State have been entirely insufficient to meet the demand, and the fuel has been brought from the mines around Puget Sound, from those of British Columbia, and from more distant points, such as Australia, Japan, and even Great Britain. The imports from the last-named country and from Australia have been made possible by the fact that a large number of vessels come to California ports to load wheat, and they are usually willing to take coal at almost any rate which will pay for loading and unloading, rather than to make the voyage in ballast. But even this costs something, and coal has always been so costly as to interfere with and check the growth of manufacturing industries. To give these a chance for fuller development a home supply of fuel has been needed, but it has not been forthcoming.

The discovery of oil in the neighborhood of Los Angeles, followed, as it has been, by the location of oil-bearing strata in the San Joaquin Valley and other sections, means a great deal for California. The manufacturers of the State are always on the lookout for new and cheaper fuel supplies, and many of them are already availing themselves of this. The California petroleum, so far as development has gone, seem to be better adapted for fuel and lubricating than for illuminating oils, and are, therefore, specially suited for the markets on the Pacific Coast. The railroads in the oil district are already large consumers, and a number of locomotives on the Santa Fe and Southern Pacific systems are now fitted up to burn liquid fuel, especially crude oil.

As the petroleum industry expands and becomes more settled and better regulated there is no doubt that special arrangements will be made to meet the demand for fuel oil and to deliver it at the larger cities and towns, where the chief demand for it will naturally exist. Especially in Southern California, oil can now be supplied at a price which makes its cost to the consumer much lower than coal, when the relative fuel values and the prices of coal are considered. The oil producers are fortunate in having a market for their product which is not only ready for them, but is also capable of a very great expansion. If, as now seems probable, there are oil-fields in California which may be relied upon as producers for a long time to come, the stimulus given to manufacturing industries in the State will be an important one and will serve to maintain the demand. The California oil may not be able to compete with the illuminating oils of the East—though that is not yet certain—but they will have special use as fuel which will maintain their value both to the producers and to the State at large.

NEW PUBLICATIONS.

"Auriferous Otago. Our Dredges, Where they are and what they are doing." Reprinted from the Dunedin "Evening Star." Dunedin, New Zealand; Joseph Brathwaite. Pages, 48; illustrated. Price (in New York), 35 cents.

This little book is a reprint of a series of letters from the Otago District in New Zealand, devoted to descriptions of the gold-dredging industry. It is not technical at all, but is made up of plain descriptions of a number of the dredging plants and the work they have done and are doing. The importance of this is shown by the list given in the concluding chapter, which enumerates 74 working companies, a large majority of them now paying dividends to their owners. A full description of the dredging industry was given in our columns not long ago by Prof. Morgan, and substantially the same facts are contained in this pamphlet, with somewhat more detail. The greatest present need in the Otago District, the writer of these letters thinks, is a light and comparatively cheap dredge which can be used for prospecting purposes, its work to be preliminary only, to determine whether it would be wise in any particular section to undertake the construction and operation of a more expensive machine. Just how such a dredge should be built he does not indicate, leaving that to builders and engineers to work out.

"Report upon Examination of Reservoir Sites in Wyoming and Colorado." By Capt. Hiram M. Chittenden, United States Engineers. Washington; Government Printing Office. Pages, 112; with maps and illustrations.

This valuable report formed a part of the papers attached to the annual report of the Chief of Engineers for 1898, but has been out of print. Recently, in response to a demand for it, a new edition has been published, so that copies can now be obtained by those who are inter-

ested. The work which it describes was undertaken in compliance with the provisions of law requiring an examination into the practicability and desirability of constructing reservoirs and other works for the storage and utilization of water and the regulation of the flow of streams in Wyoming and Colorado. Capt. Chittenden has made a close and careful examination of the region with special reference to the selection of sites for dams and reservoirs, and has collected much useful information, which is embodied in this paper.

After a general introduction and survey of the region he gives details relating to various sites which seem especially adapted for storage reservoirs, and in addition are so located as to aid in the control of different river systems. These include principally the Laramie, the Sweetwater, the Piney Creek, the South Platte and the Loveland sites, with their connected river systems. These descriptions are followed by some general considerations on the functions of reservoirs, on the regulation of streams and on protection against floods. These are illustrated by accounts of the work done on the Mississippi and other rivers in America and Europe. There is also a chapter on the construction of reservoirs, with instances of practical and successful works.

The report is accompanied by maps and a number of photographs. It is of much value to engineers and others in the region covered, and it is fortunate that copies can now be secured by those to whom they may be of so much service.

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.

"De Paris aux Mines d'Or de l'Australie Occidentale." Par O. Chemin. Paris, France: Gauthier-Villars. Pages, 370; with maps and illustrations.

"Pennsylvania: Annual Report of the Secretary of Internal Affairs. Part III. Industrial Statistics." Harrisburg, Pa.; State Printer. Pages, 580.

"Geological Survey of Michigan. Volume VIII, Part 1. Clays and Shales of Michigan." By H. Ries. Lansing, Mich.; State Printers. Pages, 68; illustrated.

"Michigan: Seventeenth Annual Report of the Bureau of Labor and Industrial Statistics." Joseph L. Cox, Commissioner. Lansing, Mich.; State Printers. Pages, 436.

"Proceedings of the Lake Superior Mining Institute. Sixth Meeting, 1900." F. W. Sperr, Secretary. Houghton, Mich.; Published by the Institute. Pages, 58; illustrated.

"Thirteenth Annual Report of the Bureau of Labor and Printing of the State of North Carolina. 1899." B. R. Lacy, Commissioner, Raleigh, N. C.; State Printers. Pages, 392.

"Municipal Public Works. An Elementary Manual of Municipal Engineering." By Ernest McCullough. Lewiston, Idaho: Published by the Author. Pages, 160; illustrated. Price, 50 cents.

"A Hand-book of Industrial Organic Chemistry." Third Revised and Enlarged Edition. By Samuel P. Sadtler. Philadelphia and London: The J. B. Lippincott Company. Pages, 544; illustrated. Price, \$5.

"A Text-Book of Important Minerals and Rocks; with Tables for the Determination of Minerals." By S. E. Tillman. New York; John Wiley & Sons, and London: Chapman & Hall, Limited. Pages, 176; illustrated. Price, \$2.

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 New Smelting Works at Sudbury.

Sir: In your issue of November 17th, I note your Sudbury correspondent states that the new works being erected there for the Orford Copper Company are owned by a corporation called the Ontario Smelting Company, composed of the principal members of the Orford Nickel Company and the Canadian Copper Company.

This is an error, as the expression "Ontario Smelting Works" is merely a name given to the works for the sake of having a distinguishing name; the proper title would be, "The Ontario Smelting Works of the Orford Copper Company." No person who is interested in the Canadian Copper Company in any way has any interest in the new works.

Robert M. Thompson,

President Orford Copper Company.

New York, Nov. 19, 1900.

Working Chinese Mines.

Sir: Mr. Catlett's article on "Coal Outcrops" in your issue of September 1st closes with the remark: "These views go to show that it is better to prospect a coal property by making a number of openings along the outcrop than by drifting under cover," and the purport of the article is that the coal on the outcrop will be nearly the same as it is under cover. Whatever may be the case in the regions examined by Mr. Catlett, the above conditions do not exist in the great coal-field of Shansi, China. In the anthracite coal-field in the southern and eastern portion of that province the outcrop is—in all the places I have seen it, in all many miles—invariably a soft blackish seam only a few inches in thickness, and the coal does not become of good quality unless covered by 100 ft. or so of ground. The seam here reaches a maximum thickness of about 35 ft. of solid coal, and in no case have I found it less than 15 ft. thick. The Chinese find it more advantageous to sink shafts to mine this coal, and as a rule their shafts are from 150 ft.

to 200 ft. deep and they say the coal is not of first-class quality at a less depth.

In spite of the present disturbed state of affairs I believe these Shansi coal-fields will soon be developed under European management and that such development will be profitable to the investors; as this opinion is at variance with that expressed by Prof. John A. Church in your edition of June 23d, and with your editorial remarks on his article, a few remarks on the other side of the question may be of interest. Prof. Church finds the Chinese very great thieves and so do many other people find them; but it does not necessarily follow that thieving cannot be guarded against in China as well as in other places. Personally, I can say that I have travelled more than 10,000 miles on horseback in the interior of China, Mongolia and Manchuria, and as far as I can remember all I ever had stolen was a leather strap which was taken when my back was turned in an inn yard in Manchuria. I will admit that I have been lectured many times by my "boy" and warned that the Chinese would steal. I attribute my immunity from loss by theft to the fact that I had good servants; and if good servants to watch one's private property can be procured in China—and that they can be so procured is the testimony of every "old China hand"—servants and officials to guard company property against theft can also be had, though with more difficulty. To procure such safety it is necessary that European control be granted and no concession for mining in China can be profitably worked without such exclusive European control. With that control I do not think there will be any special difficulty in working a good mine in China so that it will pay. However, an important preliminary proceeding is to get the mine and the right to work it under European management—not as easy a task as might be imagined.

Vladivostok, Siberia, Oct. 10, 1900.

W. H. Shockley.

How Mines Should Be Examined.

Sir: The chief interest which attaches to the discussion of the subject "How Mines Should Be Examined" comes from the perplexities which encompass an engineer, when he grapples with the all but inscrutable problem of prospective mine values. To illustrate the difficulties which beset a man who ventures forth to examine and report upon a mine, his task, in part, may be set forth as follows:

First: Ascertain the value of ore in sight, which, under prevailing conditions as to fuel, water, transportation, etc., will yield a profit.

Second: Determine from the most striking features of the vein, its walls, adjoining formation, etc., as to the probability of its continuity.

Third: Granted the continuity of the vein, determine the probability of persistence of the ore body.

Fourth: Admitting the continuity of the vein and the persistence of the ore body, what is the degree of likelihood that the character and grade of ore will not change to such an extent as to make the mining of it unprofitable.

Engineers in general will agree within approximately narrow limits upon what constitutes ore in sight. The different methods of sampling an ore body, be it streak or kidney, lenticular or other shaped mass do not present other than mechanical difficulties to be surmounted by careful and vigilant attention to details. These details, as has been said, are of an elementary character, but there is hence the greater demand for accuracy. I would offer the following brief hints, and comments in addition to valuable suggestions already made by Mr. Packer and Mr. Meriwether:

Preliminary samples should be taken to identify the richer ore streaks and mark their limits with reference to the adjacent parallel ore bodies of lower grade. These sections of a vein should be sampled separately, and the calculations of the aggregate of ore in sight based upon their tenor and tonnage as independent ore bodies. In my experience this method give more accurate results than to try to sum up diversity of values in one estimate based upon one set of general average assays. The samples of ore in a vein should be taken as nearly as is possible along a line at right angles to its dip and strike, and special care should be exercised to take alike of hard and soft ore or vein matter, whether easily or difficultly accessible.

Error frequently creeps in from taking too freely of soft ore or friable material or too sparingly of hard silicious ore. The size of each of a series of given samples will depend upon width of streak, and character of ore. If the streak be narrow and rich, the samples may be small and numerous. If free gold be distributed through large bodies of quartz or if the occurrence of precious metals be of an eccentric nature, the taking of small samples cannot be compensated for by frequent sampling. Much emphasis should be given to the comment by Mr. Packer that "it is not the amount of ore taken for a sample which counts so much as the number of pieces taken." Large samples should be broken to ½-in. diameter size, and in quartering it is essential that the pieces of each residue shall be crushed to half their preceding size. The final pulp should be passed through a sieve of 100 mesh or finer. To quarter a 100-lb. sample to a bulk of 5 lbs., without additional crushing after each quartering, as has been suggested, would be to forfeit the advantage gained by heavy sampling. In general the suggestion is sound to inspect the neighboring mines of a district for the purposes mentioned, yet is it wise to set too much store upon their successful operations? How many sepulchers of vanished fortunes are there in promising extensions to famous mines? The self-same walls, the identical pitch, the perfect resemblance in a thousand ways but one—the ore! And, anent this branch of the subject, does not 90 per cent. of the area of the hanging wall of the average vein cover that portion which is barren of pay ore?

Nowadays ores from the majority of mines are treated on the ground and not marketed as ores. In appraising a mine the problem of mining is inseparable from that of ore treatment, and the profit of mining operations more frequently depends upon successful ore treatment on the spot than upon any other factor.

Mr. Meriwether would appear to believe that common sense is a necessary adjunct of an engineer's equipment, and calls attention to an instance where a "well-known expert" dispensed with this "sine qua non." The modicum of common sense requisite to calculate the cost of transportation, fuel, water and supplies, ought not to tax the mental makeup

of any engineer while the scientific knowledge and technical skill required to devise an effective and profitable method of ore treatment and plan a mill is a proud achievement. So is the ability to properly sample an ore chute and form a conservative estimate of ore in sight. Unless common sense be a gift which experience cannot better, then most engineers will possess it at the start.

Here let me make protest against the title of "expert." The term is hackneyed and misleading. To be a plain mining engineer involves glory, hard work and anathemas enough.

The example of coarse free gold, furnished by Mr. Meriwether, would be of very unusual occurrence. The particles of gold in this instance would each weigh 4.8 grains, worth \$0.20. I would put the weight of a particle of what is commonly called coarse gold in free milling ores at somewhere about one-twentieth that amount.

I would suggest that a specific cause of "the diversity in the reports of well-known mining engineers upon the same property" arises from the multitudinous exactions of the mining engineer's profession. He must be proficient as miner, assayer and chemist, surveyor and draftsman, smelter, millman, millwright and mechanical engineer, besides being up-to-date on a host of heterogeneous subjects of minor importance. The engineer who makes some one branch of metallurgical science his specialty deserves to be commended. As a further remedy for that "something radically wrong" let one class of engineers have for their avocation the examination of a mine, and the installation of its working equipment. Let the occupation of the other class be to fix upon a method of ore treatment and the corresponding metallurgical plant. The efforts of two such engineers thus working in collaboration would eliminate the major probabilities of error and head off the vagaries to be found in some mining reports.

Frederick S. Harris.

Kansas City, Mo., Nov. 13, 1900.

TAPER DISCHARGES FOR FANS.

In London recently an interesting practical illustration of Bernoulli's theorem on the flow of fluids was exhibited by Mr. W. A. Granger. The apparatus used consisted of a No. 2 Sturtevant fan driven by a small gas engine. This fan was connected by a discharge pipe 2 ft. 10½ in. long, with an air box. In the first experiment the discharge pipe was straight, and measured 4¾ in. inside. With the engine making 78 explosions per minute, water gauges on the air box showed an air pressure of 2 in., the outlet at the top of the box measuring 7 in. by 4 in. Substituting a tapered pipe of the same length as the straight one, but measuring 4¾ in. in diameter at its small end and 7¾ in. in diameter at the large, the water gauge in the air box rose to 3¾ in., the number of working strokes of the gas engine per minute and the size of the outlet from the air box remaining as before. Since for small differences of pressure the discharge from a given outlet varies as the square root of the pressure producing the flow, the useful work of the fan was 37 per cent. more with the tapered than with the straight discharge pipe, although the latter was of the full size of the outlet in the fan casing. Attaching a water gauge at the point of junction between discharge pipe and the fan casing showed that with the straight discharge pipe there was here most violent eddying. Near the circumference of the pipe a positive water gauge of over 1 in. was evident, but on moving the gauge near the center of the pipe this changed to a vacuum. With the tapered pipe there was a vacuum throughout the whole cross-section of the flow at this point, as theory would indicate.

The advantages of taper discharge pipes both for fans and centrifugal pumps have long been matters of general knowledge, says "Engineering," but have curiously enough been but little employed in practice, perhaps on account of the higher cost of the piping, when any considerable length of it is required. Colliery ventilating fans form, of course, an exception to this statement, since it has long been the practice to build them with so-called "evasée" discharges. The advantages are pretty obvious. Thus, to take the experiment just described with the straight pipe, the air was delivered into the air box with a velocity which may be estimated at, say, 147 ft. per second, and left it at a velocity of 93 ft. per second. Since, roughly, about 1 1/3 lbs. of air were discharged per second, the energy dissipated in the air box amounted to at least ½ H. P., or some 50 per cent. more than the final useful work done. With the tapering discharge pipe the air entered the box at a low velocity. This low velocity, being acquired gradually as the air passed down the discharge pipe, was obtained with comparatively little waste in eddying motion.

THE ELECTRIC PLANT AT DESLOGE, MISSOURI.

One of the most complete and interesting power and lighting installations in the United States, has been built by the St. Louis Smelting and Refining Company, at Desloge, Missouri. There are a great many coal and copper mines operated by electricity, but this is the first lead mine that is so equipped. Economy of operation is one of the first and most vital considerations in this particular branch of mining, as the lead ore is about 450 ft. below the surface, and the lead itself is very finely disseminated, the tenor being generally 6 to 10 per cent. to the ton of ore.

The ore is brought up in cars holding 1 ton each at a speed of 900 ft. per minute, by electric hoists, and dumped on the grizzly bars, where the smaller pieces fall into a bin underneath; the larger pieces are fed into crushers which are run at 250 revolutions per minute. There are 7 crushers at each mine, belted to a jack shaft, which is driven by a 100 H. P. electric motor, placed in the hoist-house behind the electric hoisting machines. When running at full capacity each hoist and crusher motor takes care of 600 tons of ore per day. When the ore is crushed it drops into a bin, underneath which travels a belt conveyor connecting with the bins in the main concentrating mill. The ore from the other mines is all brought to this bin, which is the central storage supply for the mill; it is then fed into the crushing rolls from these bins which break it into pieces about ¼ in. by ¼ in., at the rate of 1,000 tons per day. This crushed ore goes to the jigs, which separate the lead from the rock, in water. It is handled by 12 centrifugal pumps driven by di-

rect-connected electric motors. Another centrifugal pump, driven by an electric motor is used to keep the water out of the cut where the cars come in to receive the waste rock, which is called "chats." The lead concentrates are about 70 per cent. lead and go from this mill to the roasting furnaces and then to the smelter and refiner.

The center of distribution of ore is at No. 2 Mine; a trolley line about 1 mile long connects No. 3 Mine and a line ½ a mile long connects No. 1 Mine with this point, there being three shafts in all. It also connects with the main line of the Mississippi & Bonne Terre Railroad. There are about 3 miles of single track, equipped with oak ties and 60-lb. rails. There are two trolley wires overhead, positive and negative, because the current is used in the mines for lighting and power, and the danger of grounding would be great with a single trolley line and rail return. The trolley wires are suspended for the most part by side poles and brackets. General Electric Company No. 00 grooved trolley wire is used throughout, also the standard fittings and suspensions for this style of line, with the exception of the crossing which had to be made special, on account of the proximity of the two trolley wires. At all turnouts and some switches, span wire suspensions are used. The cars are drawn by 20-ton locomotives, equipped with air brakes and double trolleys. There is no arcing noticeable when the trolleys pass the ears on account of having a smooth, uniform trolley wire surface, which is important where machines draw large amounts of current. The locomotives haul the ore from the mines to the central storage bins, the waste rock from the mill and concentrates from the mill to the railroad siding, and the coal from the railroad to the power-house dump.

The company has also a machine shop (where all repairs are made) which is run by a 10-H.-P. electric motor, and a carpenter shop and saw-mill run by a 15-H.-P. electric motor. There is also a 50-H.-P. electric motor operating a triplex pump at the river, which is 3,000 ft. from the mill. It delivers 1,000 gallons of water per minute which is used in separating the ore.

All the power is furnished for the central power house, which has a railroad siding alongside the boiler room, where the coal is dumped. The boiler room contains four 300-H.-P. Babcock & Wilcox water-tube boilers, and the engine room one 850-H.-P. cross-compound condensing Corliss engine, direct-connected to a 250-kilowatt, 500-volt compound-wound generator; the balance of the power from this engine is used to drive the jack shaft in the mill, which in turn drives all the jigs and rolls. There is a 350-H.-P. cross-compound condensing Corliss engine, direct-connected to a 250-kilowatt compound-wound generator, and a cross-compound condensing tandem Corliss valve air-compressor, capable of compressing 250 ft. of free air per minute, to 100 lbs. per square inch. The air is used in operating rock drills in the mines and signals overhead. There is also a storage battery of 250 15-plate type F cells, and booster with motor, direct-connected, having a capacity of regulating to the extent of 280 amperes on a variable load, having momentary fluctuations.

The switchboard is made from blue Vermont marble, and is equipped with quick-break switches and magnetic blow circuit breakers. There are two generator panels, three feeder panels and two storage battery panels; the sketch gives a diagram of connections.

The storage battery gives out from 70 to 80 per cent. of fluctuating load, name.y, when a hoist or locomotive starts, and maintains an absolutely constant voltage at the main bus-bars in the following way: The variable load bus-bars are not connected with the main bus-bars, except through the booster's series field when in regular operation. The series windings of the booster fields are wound in opposition to the shunt field windings, and consequently when there is a call for current on the variable load bus-bars the current coming through the booster series coils automatically weakens the fields of the boosters (which are excited from the main bus-bars) and allows the current to feed out from the storage battery to the line in parallel with the series connections, the percentage of current required from the storage battery being regulated by the shunt fields of the boosters, so that when the load goes off, the proper proportion of the current will be boosted back into the storage battery and keep it fully charged ready for the next variable load call. A three-wire connection is made for arc and incandescent lighting; positive and negative loads being taken from the main bus-bars, and the neutral from the storage battery, as shown in the diagram of connections. This gives 250 volts on a side. General Electric enclosed arc lamps are used singly across the 250 volts, and 250-volt incandescent lamps in the same way. The regulation is so close that no appreciable variation is noticed in the incandescent lighting at night, when all machinery is running. The current for each circuit is fed through a Thomson recording wattmeter; the total output is registered by one large meter connected to the main bus-bars.

The dynamos and motors were all furnished by the General Electric Company, and the storage battery by the Electric Storage Battery Company. This plant was planned and installed under the direction of Messrs. Floy & Carpenter, of New York, consulting engineers. The work of installing the electrical plant was superintended and carried through to a very successful conclusion by Mr. Alexander Anderson. This plant is one of the most modern and up-to-date specimens of the economy and flexibility of electricity for power and light.

GERMAN IRON PRODUCTION.—The output of pig iron in Germany in September was 709,200 metric tons, being 13,044 tons less than in August, but 48,032 tons more than in September, 1899. For the nine months ending September 30th the production was as follows, in metric tons:

	—1899—		—1900—		Changes. Tons.
	Tons.	Per ct.	Tons.	Per ct.	
Foundry iron	1,077,170	17.9	1,091,121	17.7	I. 13,951
Forge iron	1,255,648	20.8	1,179,306	19.1	D. 76,342
Bessemer pig	385,735	6.4	360,441	5.8	D. 25,294
Thomas (basic) pig.....	3,310,024	54.9	3,547,846	57.4	I. 237,822
Totals	6,028,577	100.0	6,178,214	100.0	I. 149,637

The total increase was 2.5 per cent. There was a very small increase in foundry irons and a considerable one in basic pig; while forge iron and Bessemer pig showed decreases.

THE CRIPPLE CREEK DISTRICT, COLORADO—IV. SOME OF THE MINES.

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

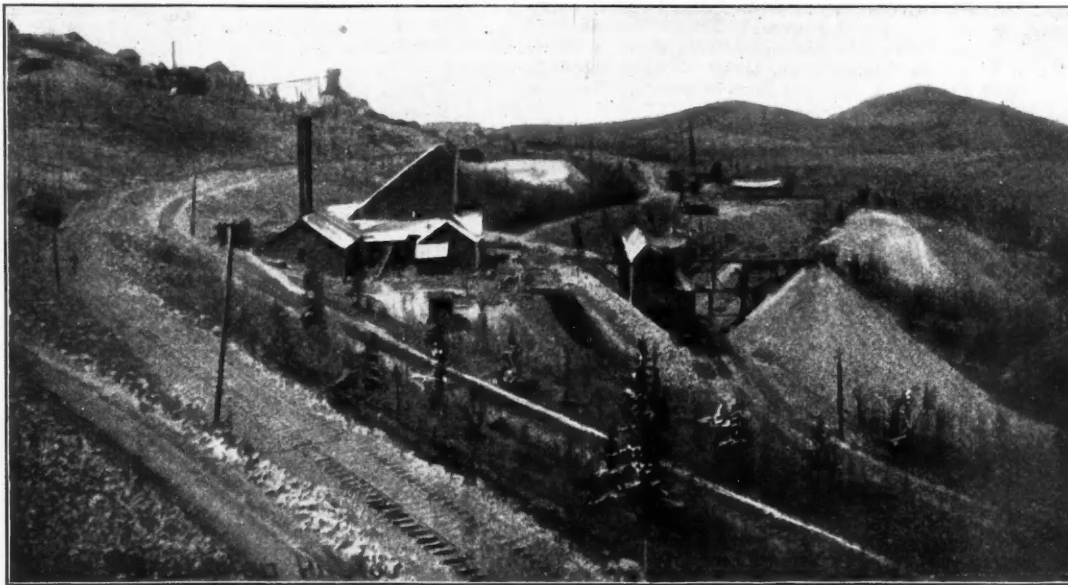
The Isabella Gold Mining Company's property is situated on the north slope of Bull Hill above Grassy Gulch and the pretty little town of Cameron; the total area of the company is about 160 acres, which, with the exception of a few small fractions, lies in one body. It has some of the oldest locations in the camp and was originally known as the Buena Vista Mine before it was consolidated and passed into the hands of the present owners. Nearly all the work is now being carried on from the Lee Shaft, around which are located the principal buildings comprising the general offices, assay office, main shaft house and ore house. The gallow's frame is of wood and it is placed over a shaft with three compartments, two of which are used for the single cages and the other as a pipe-way, a Fairbanks & Morse engine 12 by 12 in. being used to lower the pipes. The hoisting engine was built by Stearns & Rogers and is a double-reel Webster, Camp & Lane patent friction clutch 20 by 32 in. direct motion, guaranteed to raise a double-deck cage 2,000 ft. The machinery includes one Norwalk air compressor 22 by 24 in. for 12 3-in. drills; one Rand compressor for 5 drills; one Prescott pump manufactured in Milwaukee, with a capacity of 1,000 gallons a minute; one Snow pump with a capacity of 600 gallons; two number 7 Cameron sinkers, and one number 9 B Cameron sinker. There is a Bain dynamo of 130 volts, built by the Western Electric Company, of Chicago. Senn's electric signal bell and flashlight system is employed for signaling.

Steam is furnished by 6 boilers, 4 of the Fairbanks & Morse pattern,

by Webster, Camp & Lane, of Akron, O.; cylinders, 24 by 48 in.; 12-in. crank shaft, with main bearing 26 in. long. It is rated at 750 H. P., with a pressure of 100 lbs., and it is suitable for a weight of 20 tons at a depth of 3,500 ft. The brake has a 4,200-lb. weight which is released by admitting air into a cylinder; it is handled by a 3-way valve made by the Christensen Company, which makes it much smoother in action than the ordinary lever arrangement. There are 2 flat Roebbling cables 6 by ½ in., which run over sheaves 7 ft. in diameter with ring oil bearings hung on a wooden gallow's frame 65 ft. high.

The shaft is a 3-compartment one with two ways for hoisting, each 4 ft. by 4 ft. 6 in., while the third compartment is used for the pumps. A double-deck cage is used, made by McCarty & Moore, of Leavenworth. The boilers used are 2 batteries, 4 in each, of the Babcock & Wilcox type, with a total rating of 1,068 H. P.; American stokers are used with forced draft supplied by a Sturtevant engine with a 90-in. fan. Water is furnished for the boilers by a Cochrane feed-water heater and purifier equal to 1,000 H. P. The feed pumps are 2 Knowles 10 and 5 by 10 in. The steel stack is 136 ft. high, self-sustaining. There are 2 water tanks built out of California redwood, each with a capacity of 25,000 gallons, while a reserve tank is placed higher up on the mountain with a capacity of 75,000 gallons, which is only to be used in case of an emergency. The coal bunkers are placed overhead, with feed pipes running to the stokers. For pumping purposes a Snow pump with a capacity of 800 gallons is placed at the 800-ft. level. The air-compressor used was built by the Rand Drill Company, and it can furnish 2,700 ft. of air per minute. The Westinghouse signaling apparatus is used throughout the workings of the mine.

A tunnel through Squaw Mountain starts from the first level and runs 4,000 ft. to the Economic Mill, where most of the ore is treated. At a point 1,100 ft. from the west or mill end of the tunnel, there is



LEE SHAFT, ISABELLA MINING COMPANY, CRIPPLE CREEK, COLO.

each of 100 H. P., and 2 of the Heine Safety type, each of 150 H. P. They are all furnished with the American stokers with forced draft from a No. 11 Buffalo blower; hot water is supplied to the boilers by the Cochrane feed-water heater and purifier of 800 H. P., manufactured by the Harrison Safety Boiler Works, or Philadelphia.

Trackage is furnished by the Florence & Cripple Creek Railroad by grades which carry the cars to every department over 4,000 ft. of track simply by the use of the hand brakes. The ore house is built on the usual 3-story plan and the screens are arranged in such a way that the ore in each is kept separate until it is sampled and assayed; by this means it is easier to handle it according to its value, while it is also an economical measure; after having been sorted it is loaded into the cars through the usual chutes.

The production of the mine has been as follows: 1892 and 1893, \$80,945; 1894, \$131,752; 1895, \$361,905; 1896, \$568,041; 1897, \$541,077; 1898, \$565,279; 1899, \$968,011; total, \$3,217,010. The mine has paid in all up to March, 1900, the sum of \$607,500 in dividends. The average net value of the ore per ton for 1899 was \$71.36, or more than double that of the preceding year. The ores are chiefly of the oxidized variety and sulphides.

The main shaft on the Lee is now down 1,045 ft., and during the year 1899 the amount of development work done was 9,302 ft., while 1,500 ft. of work was done by lessees. The general principle is to acquire a greater depth so as to have the advantage of extended stoping grounds in the lower levels. About 160 men are employed at present.

The Gold Coin Mine is situated in the town of Victor, on the south slope of Battle Mountain. All the surface buildings and machinery were completely destroyed by fire a little over a year ago and the Woods Investment Company, which is the owner of the mine, is just completing the new buildings, and a plant of machinery which will be of the latest and best pattern. The shaft house is built of brick and is 40 by 40 ft., with a 26-in. wall; the engine house which adjoins it is also built of brick and is 53 by 83 ft.; the roofs in both cases are of steel trusses throughout. The ore house is of the usual 3-story pattern covered with corrugated iron and is 25 by 60 ft.; it is fitted with 5 screens, while the ore is loaded directly into the cars through chutes. There is a blacksmith's shop 26 by 58 fitted with all the necessary appliances for making repairs. The hoisting engine is a direct action made

a lateral tunnel toward the northeast. It is intended to extend this through the Battle Mountain Consolidated Company's property, the Columbine & Victor Tunnel, and the Bull Hill Consolidated properties, eventually reaching to the Damon Mine and the Cameron properties, 2¾ miles away. The tunnel is for most of the distance 9 ft. high by 11 ft. in width and has a double track, while the rest of it is 6 ft. in width; from the mine end a 12-in. pipe is laid for drainage purposes, as this part of the tunnel is almost exactly level. Preparations are being made to equip the tunnel with the overhead trolley system, and an engine is now being built by the Morgan Electric Company, which will be able to draw about 25 cars, each with a load of 1,700 lbs. It has been calculated that the hauling can be done in this manner for ¼ of the ordinary railroad rates.

The workings of the mine are as follows: Shaft No. 1 is down 1,035 ft.; No. 2, an incline, 214 ft.; No. 3, also an incline, is down at present 240 ft. and is being carried down still further; in all there are about 2,500 ft. of cross-cutting and 7,500 ft. of drifting; or about 2 miles in all.

The production of the mine is about 100 tons a day. There are 3 different veins with a general direction of N. 10° W.; they are of quartz carried through altered granite, no dike matter being directly associated with them, and there are semi-flat dikes which cross them, but the vein does not follow them. The high-grade ores go to the smelters, and all the others to the Economic Mill, which belongs to the Woods Investment Company. In the mine 170 men are employed. Dividends have been paid to date amounting to \$460,000.

A feature in connection with this mine which deserves mention is the fine club house 60 by 125 ft., 2 stories high, built of brick, which was erected by the company for the use of the employees, the only condition being that they must have been in its employment for a period of 30 days. The club is equipped with a comfortable reading room, which is well supplied with periodicals and books, a gymnasium, 2 bowling alleys, billiard and pool tables, card tables, and lavatories. Light lunches are served, and it is thrown open to the families of members on Sundays, while at any time it can be used for dances or social entertainments; a fine band of 25 pieces is made up of the members, and every effort is made to induce the employees to make use of the conveniences and advantages offered. The building is heated by steam and lighted by electricity.

THE PRESERVATION OF TIMBER.*

By Octave Chanute.

This paper, while in form it relates to the preservation of railroad ties, applies quite as well to the treatment of mine timbers. After referring to practice with different processes in Europe, the author sums up the question as applied to this country, as follows:

The leading features of the treatment in Europe are the following:

1. Close inspection of raw ties, rejecting all defects.
2. Thorough seasoning for 6 to 12 months before treatment.
3. Constant testing of chemicals; strength, purity, etc.
4. Injection of liberal quantities of the chemicals.
5. Minute care in all the stages of impregnation.
6. Drying the ties after injection.
7. Methods of fastenings superior to our own.
8. Deep ballast, and thorough drainage.
9. Marking with dating nails, and careful records.

Europeans are now getting a longer service out of their ties than is obtained in the United States, Mr. Curtis having shown, in his paper read before this society, May 17th, 1899, that an average life of 10 to 12 years is being obtained by the use of zinc chloride in this country. It would be possible to obtain a life of 15 to 30 years by the use of creosote, but this would cost three to four times as much as zinc chloride. Thus, at present prices, it would cost 45c. each to creosote according to English practice, and 15 to 16 years' life would be obtained; it would cost about 85c. each to creosote after the best French or German practice, and 27 to 30 years' life would be obtained in thoroughly drained ballast; but it would not be economical to spend such sums upon ties costing 20 to 40c. each untreated, while it is economical to spend them upon ties costing from 90c. to \$1.50 each abroad.

We must be content, therefore, either to allow our cheap ties to decay in the good old way, or to adopt for the present some of the cheaper and inferior methods which will produce shorter lives than obtained in Europe. By the light of past experience, those cheaper methods may be said to be three in number: 1, straight Burnettizing; 2, the zinc-tannin process, and 3, the zinc-creosote process.

The writer is satisfied that the zinc-tannin process, as modified by himself in 1896, is superior to straight Burnettizing, and that the record of the next few years will demonstrate this, yet he is desirous of doing still better work, and he went abroad chiefly to investigate the zinc-creosote process. He now thinks that it is probably superior to the zinc-tannin process, although part of the greater life shown by records is attributable to other causes, such as the better ballast and drainage, and the better modes of fastening, as well as the climatic conditions. There are, however, some serious difficulties to be overcome before the process can be introduced here. Suitable tar-oil is just now very scarce and high in price, so high that the freight, the leakage and the cost of the barrels render the cost almost prohibitory. The writer took over with him two samples of American creosote from different makers, and had them analyzed in Berlin, where they were pronounced by Mr. Rütgers' chemist quite unfit for tie preserving by the zinc-creosote process. The writer brought back samples of the German tar-oil and is now endeavoring to procure a similar product in this country. He is also investigating, so far as he can, the merits of the various new processes which are being advanced from time to time, with the hope of finding some method which he can recommend.

The principal dilemma, with reference to new processes, is the fact that it takes half a business lifetime (15 to 18 years) to ascertain beyond peradventure whether an antiseptic or a method is thoroughly efficient to preserve ties in the track; yet it may be possible by isolating the bacteria and fungi which are most destructive to wood, and inoculating chips and shavings with the cultures, to draw some approximate conclusions in the course of a few months. Meanwhile it is recommended that the railroads shall give trial orders to the various parties who offer plausible processes, and then expose the treated ties in such locations as admit of careful record and watching of the results.

The principal new processes are as follows:

1. The Creo-Resinate Process.—This process proposes the use of creosote and resin, both preservative substances, to which a small percentage of formaldehyde is to be added. It may be questioned whether the latter volatile substance will stay in the wood, but the process is well worth trying, provided sufficient quantities of the chemicals are injected.
2. The Water-Creosote Process.—This consists in injecting an emulsion of creosote and water, and is being experimented with in Berlin. The writer expects to have samples sent to him this year.
3. The Hasselman Process.—This consists in boiling the wood in a solution of the sulphates of copper and iron, with alumina and kainit. It possesses the merit of being cheap, and some ties prepared in that way have now been three years in the yard tracks in Berlin. Works have been started at Perth Amboy, N. J., to work this process.
4. The Allardyce Process.—This consists in the injection of chloride of zinc, followed by a second injection of tar-oil. A similar process was patented by the late J. P. Card in 1882, but neither he nor the writer, who subsequently became his partner, ever succeeded in doing good and regular work therewith, notwithstanding many experiments.
5. The Naphthenic-Acid Process.—This consists in injecting the wood with a solution of copper which has been dissolved in an acid obtained by a peculiar process in the distillation of Russian petroleum. It is stated to be theoretically effective and cheap, but American petroleum differs so much from the Russian in chemical constituents, that it is yet a question whether the naphthenic acid can be produced in this country.

Laboratory tests are sometimes misleading. They show, for instance, that bichloride of mercury and sulphate of copper, as antiseptics, are superior to chloride of zinc, and yet the latter preserves ties better. So with carbolic acid, which is stated by Mr. Boulton to be less effi-

cient than the heavy oils of creosote. Such criticism, however, does not apply to the laboratory tests of the strength and purity of the materials used, and there are three features of the European practice which it would be well to imitate in this country. They are the following:

1. The careful testing, chemically, of the antiseptics to be injected.
2. The uniform injection of the wood with stated and liberal quantities of the antiseptics.
3. The adequate seasoning of the wood before treatment. This is now generally neglected in the United States, and yet it is the most important requirement in obtaining good results, for, otherwise, the antiseptic will not be uniformly distributed, and some portions of the ties will decay before others.

Originally, at the works of the writer, ties were treated in the order of their arrival, and without regard to their condition. The result was that in 6 or 7 years some were found to decay much in advance of others. Experiments, made by weighing considerable numbers of individual ties before and after treatment, disclosed the fact that there were great differences in the absorption, and in later years arriving ties have been tested, sorted out, and seasoned in case of need, so as to obtain uniformity of treatment, with the result that the average absorption of chloride of zinc is now 2½ times as much as it was 14 years ago.

From his experience the writer is satisfied that if the ties are injected with reasonable uniformity, and with the equivalent of ½ lb. of dry zinc-chloride to the cubic foot, as is done in Germany, straight Burnettizing makes them last 10 to 12 years in the track, with ordinary exposure; while perhaps half of that quantity will produce the same result in the more arid regions of the United States; that the new zinc-tannin process will impart to them a life of 12 to 14 years, and the zinc-creosote process may extend this to 14 or 16 years.

It cannot, however, be too strongly insisted upon that the work must be well and skilfully done, for, otherwise, the results are sure to be disappointing.

OIL FUEL IN RUSSIA.—The "Petroleum Review" says that one of the difficulties which the Russian cotton industry has to contend with is the increased cost of fuel. This is particularly the case in the Moscow-Vladimir Region, where oil fuel is chiefly used. It is, therefore, of the greatest importance that a continuous and regular supply of oil fuel should be assured to the manufacturers. With this object in view a company is now being formed by a group of Baku, Astrakhan, and Moscow merchants, who intend to acquire several petroleum plots at the forthcoming auctions at Baku, and exploit them with the main object of supplying fuel to the Moscow, Vladimir and Nijni-Novgorod manufacturing districts.

TUNNELING THE STRAITS OF GIBRALTAR.—An ingenious plan has been submitted by M. Berlier, a French engineer, to the Governments of Spain and Morocco, for connecting these two countries by means of a tunnel, from a point on the Spanish coast near Gibraltar to Tangier. The tunnel would run beneath the sea for 32 kms.; its total length, including two land approaches, being 41 kms. The construction of the tunnel, with a double line of railway, it is said, would involve no greater difficulties than those of Mont Cenis or the St. Gothard, while the cost is estimated by M. Berlier at not more than 3,000 fr. per meter, which was the cost of the Simplon Tunnel. M. Berlier believes that the whole tunnel might be completed in 10 years.

GOLD REGULATIONS IN SIBERIA.—The Russian Government has modified the law relating to the purchase and sale of gold in bars, nuggets, or dust. Hitherto, in the gold-bearing regions only authorized mine-owners, whose names were duly entered in the registers of the Mining Department, were permitted to be in possession of the uncoined metal. In Siberia this restriction led to an enormous traffic in contraband gold. The greater part of it was disposed of to Chinese and conveyed to China. The new regulations allow gold to be purchased by other bodies than the State Mining Department, as, for example, the Imperial Bank and the Russo-Chinese Bank. It is expressly stated that no inquiry shall be made as to where the metal came from, which puts it on the same level as any other article of merchandise. It will no longer be possible for a man found in possession of the raw gold to be imprisoned, and the metal confiscated. The change is thought to be connected with the seizure of the rich gold-fields on the Chinese side of the Amoor River. As it has never been possible to prevent illicit trade in uncoined gold in Siberia, the Russian authorities probably recognized the hopelessness of blocking the traffic in a country so unsettled as Manchuria.

PRICES OF ARMOR PLATE.—With regard to the settlement of the armor-plate controversy the following official statement has been given out concerning the agreement:

"The Navy Department has come to an agreement with the Carnegie and Bethlehem Companies for Krupp armor of the first-class, amounting to 24,950 tons, for \$420 a ton. The Krupp process involves the Harvey patent, the validity of which is now under consideration by the courts, and it is further agreed that the Government will assume in addition any liability for the Krupp process not exceeding £5, or \$24.32, a ton for Krupp royalty, and not exceeding the United States license fee of \$11.20 for Harvey royalty. The maximum price to the Government is therefore \$455.52 a ton, subject to diminution in case of any reduction in the foregoing royalties. The bid of these companies for this class of armor was \$490, and the price originally asked, \$545.

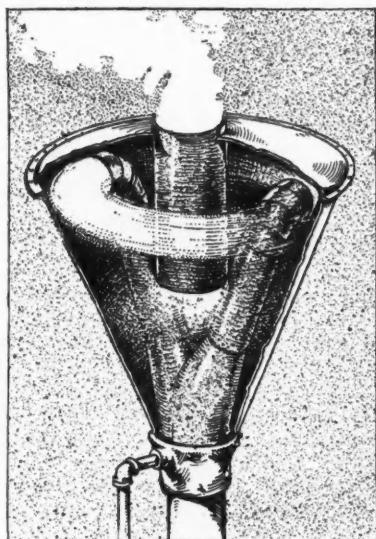
"The Midvale Company some time ago withdrew their bid, but they would have been unable, in any event, to furnish armor in due season for the Maine class of battleships. Had they not withdrawn their bid it is probable that some arrangement might have been made for the distribution among the three companies of the manufacture of the armor other than that of the "Maine" class. Their bid, however, was of value in enabling the department to secure the above large reduction."

*Abstract of paper read before the American Society of Civil Engineers.

THE STURTEVANT EXHAUST HEAD.

An interesting example of the practical application of centrifugal force is presented in the design of the Sturtevant exhaust head. The accompanying illustration serves not only to show its construction but also its method of operation. Externally it appears to be an inverted cone of heavy galvanized steel plate attached to the end of the exhaust pipe. Its interior construction is shown to consist of two branching pipes extending upward from and connected to the exhaust pipe. These individual pipes, which are parallel to the sides of the casing, terminate in elbows from which the steam escapes. Its contact with the circular sides of the case gives it a whirling motion which thus gives centrifugal force an opportunity to act. Inasmuch as this force is proportional to the weight of the substance acted upon and as water weighs about 1,600 times as much as does exhaust steam, the natural result is that the water contained in the steam is thrown outward in radial lines with great force. Striking upon the sides of the cone it trickles to the bottom and there escapes through the drip pipe. Such oil as may be entrained with the steam is likewise separated. The steam, now dry, is forced downward by the additional entering volumes and quietly escapes to the atmosphere through the central pipe. It is evident that all tendency on the part of the water to escape with the steam is most forcibly overcome by the centrifugal action.

The central pipe being made larger than the supply beneath and the cold sides of the case tending to condense a portion of the steam, it is manifest that no back pressure can be exerted upon the engine. The absence of baffle plates and the absolute simplicity of design are the best guarantees of endurance on the part of this head. It is built by the B. F. Sturtevant Company, of Boston, Mass., in sizes ranging from 1 in.



STURTEVANT EXHAUST HEAD.

up to 36-in. size of exhaust pipe. This company has just received the order for two immense exhaust heads, one for a 30-in. pipe and one for a 36-in. pipe, which are to be built on this design.

ENGLISH IRON WORKS.—On November 3d the very large works of the Barrow Hematite Steel Company at Barrow-in-Furness, England, were stopped, owing to the high price of fuel and the lack of orders requiring urgent delivery. Between 3,000 and 4,000 iron-workers, with many of the miners and the quarrymen in the Furness district, are thrown idle. The Askam Works of the Millom & Askam Company have been damped down, and a furnace is also out of blast at Millom.

RAILROAD ACCIDENTS IN GREAT BRITAIN.—A Parliamentary paper has just been issued giving the returns of accidents and casualties as reported to the Board of Trade by the railway companies in the United Kingdom during the three months ending March 31st last. Accidents to trains, rolling stock, permanent way, etc., caused the death of 14 and injury to 256 persons. Altogether the number of persons killed and injured on railways in the United Kingdom in the course of public traffic during the three months was as follows: Killed, 314; injured, 1,915; as compared with 269 killed and 1,636 injured for the corresponding period in 1899, being an increase of 45 killed and 279 injured.

MINERAL PRODUCTION OF GREECE.—Exports of minerals from Greece for the first quarter of the current year included 3,278 metric tons argentiferous lead ore; 8 tons galena; 90,561 tons manganiferous iron ore; 49,100 tons hematite iron ore; 4,515 tons calamine and 3,561 tons blende zinc ore; 1,123 tons emery; 60,918 tons miscellaneous—chrome ore, manganese ore, magnesite, alum earth and kaolin. Of these exports 468 tons emery, with magnesite and chrome ore to the value of 16,000 fr., were to the United States.

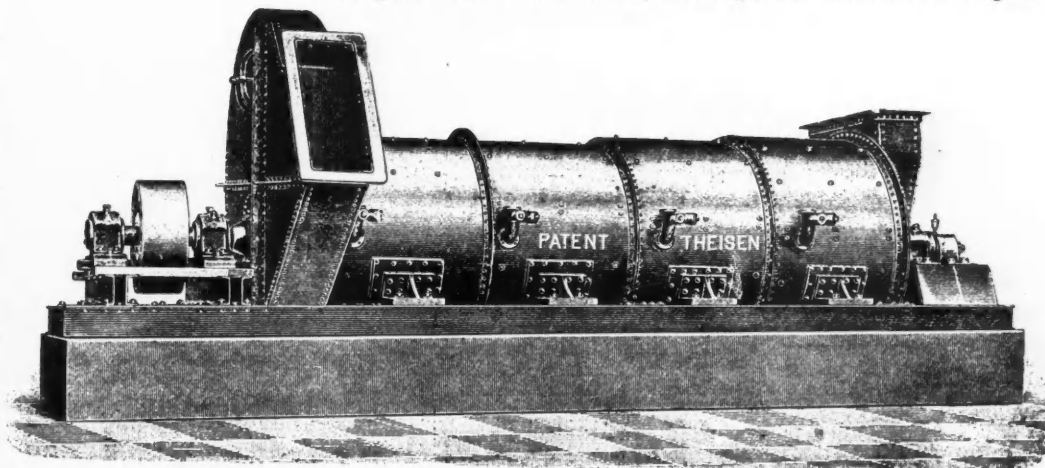
Belgian people have formed several companies to start in the beginning of 1901. A mine of iron (55 per cent. metallic) has just been sold to a Belgian, Mr. Lecoq, who is now working. This mine is situated in the Peloponnesus, at a place called Hermione, and is of an area of 1,200 hectares, and has been sold for 500,000 fr.

Two very important mines are reported to have been discovered in the province of Thessalia, at a distance of 4 kms. from the Thessalian Railway main line, and of an area of 2,000 hectares. One of these is a deposit of iron and copper pyrites, the other a deposit of iron ore. A discovery of cinnabar is also reported near the same locality.

THE THEISEN CENTRIFUGAL PURIFIER FOR BLAST-FURNACE GASES.*

Of the two fundamental methods of gas purification—the wet and the dry processes—the latter, in its ordinary form, is unsuitable for blast-furnace gases on account of the large area required for the settling chambers, and the use of ordinary scrubbers is not satisfactory. A departure from the usual method of quiescent settling is afforded by the centrifugal apparatus invented by Ed. Theisen, of Baden-Baden, and shown in the drawing. This is based on the idea of forcing the gas under high pressure from a centrifugal fan, against water, and thus bringing about an intimate contact and strong friction between the washing liquid and the gas. The principle involved consists in drawing in a current of gas by means of a high-speed fan, which then forces the gas against a layer of water maintained in circulation on the internal surface of a fixed cylinder. The heat in the incoming gas converts a part of the washing water into steam, and thus particles of dust become enveloped in water vapor and are deposited on the subsequent condensation of this vapor.

This purpose is fulfilled by a simple apparatus consisting of a horizontally-mounted centrifugal drum enclosed in a cylindrical packet and fitted with vanes which draw in the gas, force it against the washing surface, and cause it to circulate further through the apparatus. In proportion to its size this appliance is very effective, a cylinder 60 in. in diameter and 15 ft. long being capable of dealing with 200 cubic meters (7,060 cu. ft.) of blast-furnace gas per minute, while an apparatus of twice the above diameter and 1½ times the length will treat 6 times the above volume of gas. The centrifugal current of gas is pressed against the rapidly moving and finely-divided layer of water, the intimacy of the mixture being still further increased by having the washing surface roughened so as to break the water up into spray. The greater the relative velocity of the gas and water and the higher



THEISEN PURIFIER FOR BLAST FURNACE GASES.

the pressure of the gas, the greater will be the friction between the two, and the higher the capacity of the apparatus for its size. It is advisable not to have the washer too far away from the blast furnace, or the gas will have lost part of its heat and be less capable of vaporizing the washing water.

The latter is stored in a tank below the foundation of the apparatus. This tank is divided into compartments into which dips the washing cylinder, which is provided with water orifices below and is kept tight by the pressure of the water. The division of the tank into compartments enables the temperature of the water to be regulated in the different parts of the apparatus, the coolest being farthest from the entrance. The used water, containing the deposited dust, is led into settling tanks and afterward run down a series of steps to cool.

The velocity of the gas current can be regulated by adjusting the pitch and speed of the vanes; as a rule it enters at the rate of 10-25 m. per second, but passes over the washing surface at a velocity up to 55 m. per second, and issues from the apparatus at a pressure equivalent to 2-4 in. water gauge. This pressure is sufficient to drive the gas through a burner, where it draws in a sufficiency of air for combustion, burning with a perfectly blue flame of high temperature. The washing apparatus can be fitted with a pressure-equalizer to compensate any irregularities of pressure such as are liable to occur in blast furnaces.

A Theisen purifier of the following dimensions has recently been erected at the Hoerder Bergwerks- und Hüttenverein. Height, 60 in.; length, 15 ft.; pressure in suction pipe, 1 to 1½ in.; pressure in pipe leading to gasometer, 5 to 6 in. It is provided with three water-tanks under the foundation, each of which holds about 220 gals.; and the consumption of water amounts to about 1 liter (0.22 gal.) per cubic meter (35.3 cu. ft.) of gas, 100 cubic meters being treated per minute. The dust content per cubic meter of gas is reduced from 3.3425 grammes to 0.010 gramme, and the moisture from 36.21 grammes to 3.013 grammes.

RECENT DECISIONS AFFECTING THE MINING INDUSTRIES.

Specially Reported for the Engineering and Mining Journal.

DUTY ON VARNOLLETTE.—A composition of resinat of lead—or resin and compounds of lead—manganese, and lime, which is used as a seccative or drier in varnish, linseed oil, paints, inks and stains, and

*Abstract of article in "Stahl und Eisen."

which is generally known in commerce as "varnolette," is a chemical compound, dutiable at 25 per cent. ad valorem under paragraph 3, act of July 24th, 1897, and not at 20 per cent. ad valorem under section 6 or by similitude or otherwise under section 7 of said act.—Protest of Strohmeyer & Arpe, against decision of Collector of Customs at New York; United States Board of General Appraisers.

FATAL ACCIDENTS IN COAL MINING IN NORTH AMERICA.

Written for the Engineering and Mining Journal by F. L. Hoffman.

During the year 1899 the actual and comparative frequency of fatal accidents in coal mining operations has been greater than during any year of the preceding decade, excepting 1891. While the average rate for the ten years 1890-1899 is shown to have been 2.64 per 1,000 of men employed, the rate for 1899 is returned as 2.99 per 1,000, a material increase, for which it is difficult to ascertain a definite cause. The total number of lives lost in coal mining operations is shown to have been 1,200 during 1899, against 1,076 during 1891.

The first table will show the total number of persons killed in coal mining in the United States and Canada during each of the years forming the period 1890-1899.

	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	Tot'l
Colorado	16	30	34	46	19	23	68	35	24	41	336
Illinois	53	60	57	69	72	75	77	69	75	84	691
Indiana	5	5	19	22	*	23	28	16	22	16	156
Indian Territory	*	*	*	*	13	6	12	22	17	25	95
Iowa	13	19	24	29	19	20	22	21	26	20	213
Kansas	8	18	*	15	26	10	12	6	17	16	123
Kentucky	11	16	8	12	10	8	6	12	6	7	96
Maryland	8	6	6	5	7	9	6	5	4	5	61
Missouri	10	18	20	21	19	13	16	8	9	14	148
New Mexico	*	*	*	*	*	28	7	7	7	15	64
Ohio	42	44	42	32	45	52	41	40	52	57	447
Pennsylvania (anth.)	378	427	396	425	439	420	502	424	411	461	4,283
Pennsylvania (bit.)	146	237	133	131	124	155	179	149	199	258	1,711
Tennessee	*	22	14	11	14	40	22	10	19	20	172
Utah	*	*	*	2	1	1	3	3	3	3	13
Washington	*	*	55	9	50	35	8	7	9	42	215
West Virginia	*	36	36	72	59	83	65	62	90	89	592
British Columbia	4	15	6	16	4	10	9	6	7	11	88
Nova Scotia	7	128	9	2	13	9	8	7	7	19	209
Total	701	1,076	859	919	934	1,020	1,091	909	1,004	1,200	9,713

*No report. It is shown that in the aggregate 9,713 lives have been lost during the ten years under consideration. It is unfortunate that for the few States the records are not quite complete, but the omissions have been indicated so as to avoid an erroneous interpretation of the table.

The following table will show the fatality rate per 1,000 of men employed in each of the States and Provinces during the ten years under consideration. The States for which the record is not quite complete have been indicated in order to avoid any error in the interpretation of the table.

	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	Tot'l
Colorado	2.27	4.40	4.49	6.31	3.06	3.05	10.07	4.99	3.23	5.60	4.73
Illinois	1.85	1.82	1.69	1.95	2.21	2.35	2.33	2.04	2.14	2.27	2.07
Indiana	0.76	0.72	2.50	2.96	*	2.92	3.94	2.00	2.63	2.07	2.32
Indian Territory	*	*	*	*	3.95	1.64	3.26	6.34	4.82	6.24	4.39
Iowa	1.51	2.08	2.58	2.77	1.85	1.82	2.62	2.45	3.38	2.49	2.30
Kansas	1.77	2.08	*	1.52	2.58	1.11	1.36	0.71	1.95	1.57	1.62
Kentucky	1.50	2.49	1.04	1.41	1.25	1.02	0.79	1.55	0.67	0.83	1.22
Maryland	2.08	1.54	1.52	1.23	1.69	2.30	1.53	1.17	0.89	1.08	1.49
Missouri	1.67	2.62	2.48	2.70	2.49	1.84	2.41	1.22	1.22	1.80	2.06
New Mexico	*	*	*	*	*	16.88	4.87	5.13	3.71	7.98	7.78
Ohio	1.89	1.83	1.56	1.11	1.43	1.79	1.44	1.39	1.77	2.03	1.61
Pennsylvania (anthracite)	3.21	3.47	3.05	3.08	3.14	2.92	3.35	2.84	2.89	3.28	3.12
Pennsylvania (bituminous)	2.18	3.21	1.69	1.60	1.44	1.83	2.14	1.72	2.38	2.82	2.08
Tennessee	*	4.32	2.84	2.21	2.53	7.81	3.37	1.58	2.43	2.90	3.18
Utah	*	*	*	*	3.47	1.49	1.49	4.35	4.17	4.38	2.53
Washington	*	*	18.58	3.18	14.79	12.38	2.98	2.48	2.70	28.00	9.62
West Virginia	*	3.16	2.76	4.20	2.98	3.97	2.68	2.89	3.86	3.55	3.36
British Columbia	1.78	4.45	2.24	5.12	1.25	3.42	3.27	2.49	2.46	2.91	3.00
Nova Scotia	1.31	22.28	1.55	0.34	2.41	1.55	1.33	1.35	1.56	3.39	3.78
Total	2.43	3.30	2.51	2.46	2.47	2.63	2.78	2.31	2.54	2.99	2.64

*No report. It appears from this table that while the average rate for the decade has been 2.64 per 1,000, the highest rate is reported for Washington at 9.62 per 1,000, while the lowest rate is reported for Kentucky at 1.22 per 1,000. As has already been stated, the year 1899 had an average rate of 2.99 per 1,000, showing the highest record for the decade, excepting the year 1891, when the fatality rate reached 3.30 per 1,000.

For want of space it has not been possible to give the complete returns of the number of men employed in mining operations in all of the States and Provinces included in the preceding tabulation, but a summary statement is given in the table below for the entire area under observation for the 10-year period 1890-1899, showing the number of men employed, the number killed, and the corresponding fatality rate per 1,000.

	No. of Employees.	No. killed.	Rate per 1,000.
1890	288,205	701	2.43
1891	325,840	1,076	3.30
1892	342,744	859	2.51
1893	374,017	919	2.46
1894	377,626	934	2.47
1895	387,303	1,020	2.63
1896	391,990	1,091	2.78
1897	393,025	909	2.31
1898	395,553	1,004	2.54
1899	401,868	1,200	2.99
Total	3,678,171	9,713	2.64

In a somewhat more convenient form the increase or decrease in the fatality rate during the past year is shown in comparison with the preceding five-year period 1894-1898 in the table which follows:

Fatal Accidents in Coal Mines in 1899, Compared with Five Previous Years, 1894-1898.

	No. of persons killed, 1894-'98.	1899.	Rate per 1,000 employed, 1894-'98.	1899.	Increase or Decrease per 1,000, 1899.
Colorado	34	41	4.83	5.60	+ 0.77
Illinois	74	84	2.21	2.27	+ 0.06
Indiana	22	16	2.84*	2.07	- 0.77
Indian Territory	14	25	3.98	6.24	+ 2.26
Iowa	22	20	2.35	2.49	+ 0.14
Kansas	14	16	1.57	1.57	+ 0.00
Kentucky	8	7	1.05	0.83	- 0.22
Maryland	6	5	1.50	1.08	- 0.42
Missouri	13	14	1.84	1.80	- 0.04
New Mexico	12	15	7.72*	7.98	+ 0.26
Ohio	46	57	1.56	2.03	+ 0.47
Pennsylvania (anthracite)	439	461	3.03	3.28	+ 0.25
Pennsylvania (bituminous)	161	258	1.88	2.82	+ 0.94
Tennessee	20	20	3.19	2.60	- 0.59
Utah	2	...	3.20	...	- 3.20
Washington	22	42	7.24	28.00	+20.76
West Virginia	72	89	3.27	3.55	+ 0.28
British Columbia	7	11	2.55	2.91	+ 0.36
Nova Scotia	9	19	1.64	3.39	+ 1.75
Total	997	1,200	2.55	2.99	+ 0.44

*The data for Indiana and New Mexico are for the four-year period, 1895-1898.

It is shown by this table that the rate has increased in 12 States or Provinces, while only 7 States show a decrease. The decrease has been largest in Utah, where no fatal accidents occurred during the entire year, in marked contrast to the terrible calamity which occurred in that State during the early part of the present year. The highest increase is reported for Indian Territory, Nova Scotia, Pennsylvania (bituminous), Colorado and Ohio, in the order named. The table shows that, for instance, in Pennsylvania in the bituminous region, where the average number of lives lost per annum has been 161 for the five years 1894-1898, the number lost during the year 1899 was 258, equal to a corresponding increase in the rate per 1,000 from 1.88 to 2.82. It is quite clear from the tables which have been presented that the conditions affecting the coal mining industry during 1899 have not been favorable to a diminution of the fatal accident rate which it would seem reasonable to expect in view of the considerable extension of the State inspection system and the increased intelligence on the part of managers and employees as to the causes most productive of serious casualties. When it is taken into consideration that the average rates presented are merely an approximate indication of the dangers pertaining to the mining industry and that they are partly impaired by the fact that employment in coal mining is often for but two-thirds of the year, and that on the other hand no distinction is made as to employment inside or outside of the mine, the former being, of course, the much more dangerous occupation, it is quite plain that the coal mining industry must continue to be considered one of the most dangerous employments in the category of hazardous occupations. But it would be erroneous to conclude that the mining industry, as such, is to be considered much more dangerous than, for example, the railroad industry, as is shown by the following comparative table, giving the rates per 1,000 of men employed for both the coal mining and railroad industries of this country.

	Coal Miners.	Railroad Employees.
1890	2.43	3.27
1891	3.30	3.39
1892	2.51	3.11
1893	2.46	3.12
1894	2.47	2.34
1895	2.63	2.31
1896	2.78	2.25
1897	2.31	2.06
1898	2.54	2.24
1899	2.99	2.38
Total	2.64	2.64

*The coal mining accident rate is for North America; the railroad accident rate for the railroads of the United States reporting to the Interstate Commission.

By a curious coincidence the average fatality rates are exactly the same for both occupations for the decade under consideration, and there would seem to be in many other respects a close analogy between the occurrence of fatal accidents in both occupations, since it appears that 1891 was the year showing the highest casualty rate in railroad management, as well as in the coal mining industry, while from 1891 to 1897 there is shown in both occupations a tendency toward a decline in the fatality rate. There appears in both occupations a strong indication toward an increased fatality rate during the past two years, but with this difference, that while previous to 1894 the railroad fatality rate was uniformly higher than the coal mining rate, since that year the fatality rate in coal mining operations has been without exception in excess of the fatality rate of railroad operations.

I can only repeat what I said in the "Engineering and Mining Journal" January 27th last that "The very fact that more than 1,000 lives are lost every year in coal mining operations is sufficient to cause reflection and serious consideration of the point whether all reasonable precautions have been taken during recent years to reduce this loss of life to a minimum. Looking at the returns for Kentucky it would seem that there is hope for a very material reduction in the accident liability of coal miners, and that in consequence of more efficient inspection, more careful instructions, more intelligent labor and improved methods of operations, the loss of life will be materially decreased during future years."

COAL AND WATER-POWER IN ITALY.—Italy depends almost entirely upon foreign fuel for industrial purposes, says London "Engineering," but it would appear that by making use of her natural water power for generating electricity, the import of coal is gradually diminishing. In 1899 there were 4,860,000 tons of coal imported, of which 3,110,000 tons were purchased from abroad in the first six months. Compared with this, during the first seven months of this year, only 2,837,000 tons of coal were imported, or a decrease at the rate of about 470,000 tons a year.

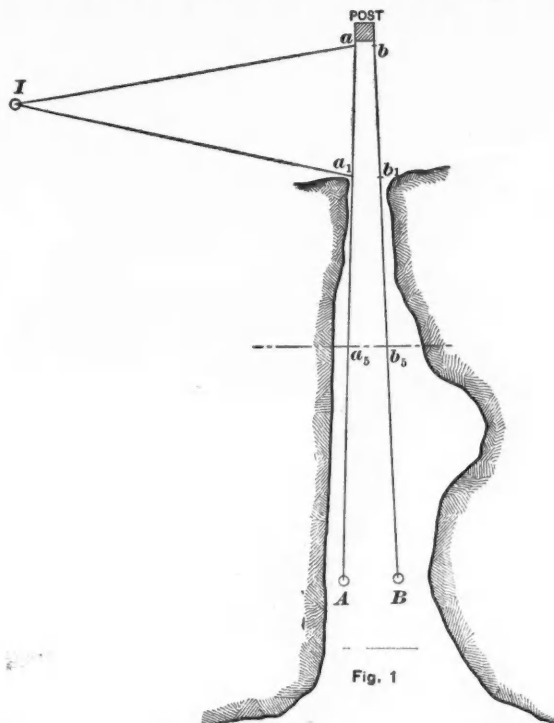
OBTAINING THE VOLUME OF SMALL DRIFTS AND WORKING-PLACES.*

By C. S. Herzig.

In the "Engineering and Mining Journal" of January 27th, 1900, there appeared an article by Fred. T. Greene, describing a method of measuring stopes by the use of strings, a clinometer and a tape. In the early part of 1899, I had occasion to use a somewhat similar method, for the purpose of accurately ascertaining the volume of a very irregular drift, connecting two mines. This drift was an important factor in a lawsuit for \$150,000, in which it was necessary to determine accurately the volume originally occupied by the material extracted from the drift.

While it is unnecessary to give all details of the controversy, some explanation of the condition is required for a clear understanding of the following description. This drift was started by the "K." Company from its workings, in about 7 ft. of ore, and headed toward the "G." property, the plan being to extract all the ore between foot- and hanging-walls, but to take out nothing but ore. As the G. workings were approached, the ore-body became very irregular and much thinner. It was, however, very closely followed, and where the drift broke through into the G. workings, the hole was only 11 in. high by 14 in. wide, or just about the size of a manhole in a boiler. Thus, this connection-drift tapered sharply; and the very irregular foot-wall sloped toward the G. workings, and entered them at a place where the stope was only about 3 ft. high, and the ground had already commenced to cave. It may be added that the ore-body was a nearly flat deposit of lead carbonate in limestone, the ore and gangue being quite soft.

I was called upon by the G. people to make the survey required to show the relation of this drift to their own workings. The opening



MEASURING VOLUME OF SMALL DRIFTS.

through with b1b. In this manner the plane of the two strings was accurately located. The next step was to measure the distance aA and bB. This done, as many parallel cross-sections as were desired could be obtained with the aid of plumb-bobs, nails, fish-line and a tape. The locations of these cross-sections were selected in an arbitrary manner, according to the irregularities of the drift, so as to obtain the precise volume.

The "modus operandi" was as follows: Let us assume that a section was desired at, say, a2b2, Fig. 1. The distance from a to a2 was measured along the string aA, say 16.3 ft.; the same distance, 16.3 ft. was laid off on bB from b, and each point was marked with a lead-pencil on the string, or by a string tied around the point. Nails were then driven in the roof, directly over these points, in such a manner that plumb-lines suspended from them just touched the strings aA and bB at the marks, a2 and b2. By this means, two points in the roof (c and d, Fig. 2) and two points in the floor, e and f, were fixed by measuring the distances a2c, a2e, b2d and b2f. It was found convenient in most cases to mark the points in the floor with nails. Points g and i were next located by stretching a string across the drift so that it just touched at a2 and b2; and then the distances a2i and b2g were measured. It will be seen that g and i are points in the plane of the strings aA and bB. Point h was next located by making an offset of, say 0.9 ft. from a2 toward i and measuring vertically to the roof. Point k was fixed by measuring, say, 0.8 ft. down from both a2 and b2 and measuring across the plane of those two points, which is parallel to the plane of the two main strings.

As many points as are desired may be located in a similar manner, the main idea to be kept in view being that all measurements should be made vertically, or in a plane parallel to the plane of the two main strings. A sketch of each separate section is made in the notebook and all the measurements are marked thereon; the sketch being labelled at the top of the page with the distance from the initial points a and b. Having secured as many sections as are desired, the office-work to be done consists of a series of very simple calculations. From the work at the instrument, after the proper calculations have been made, the

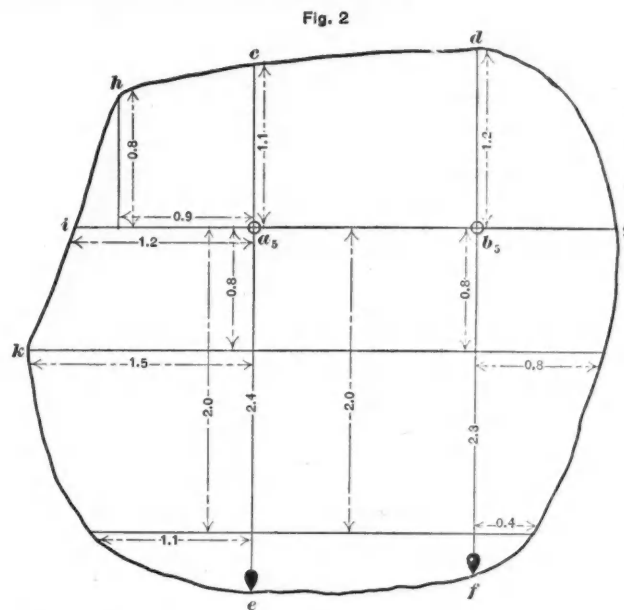


Fig. 2

into their own stope being so small, the roof being so low, and the drift itself being so irregular, it was quite impossible to get any satisfactory results with the transit in the ordinary way, because it was impossible to set up the instrument in any position outside the hole so that a new station could be located within, high enough to permit setting up the instrument. Upon consideration, I devised a method which gave us the volume very accurately and tied this drift to our other workings. What was sought was a series of parallel cross-sections, at a known distance apart, from which we could calculate the volume, as in railroad earth-work.

About 7 ft. in front of the 11 by 14 in. hole, and about square with it, stood a 12 by 12 in. post. A horseshoe nail was put in each of the two edges facing the hole. Two nails were now driven at A and B, Fig. 1 into the roof of the drift as far inside as was feasible, and strings were stretched between them (aA and bB, Fig. 1).

Then working up from the nearest station, a new transit station, I, was located as far away as possible, yet in such a position that all the string outside the hole was visible. From this station two points on each string (a and a1, b and b1) were now carefully located and marked by means of fine piano-wire wound around the string; a and b were placed close up to the nails in such a manner that a line connecting them would make about the same angle with each of the strings; a1 and b1 were put as far along the strings as they were visible from the instrument.

Sighting at a, the distance Ia was measured and the vertical angle was read. The angle a1a was next turned off and read, after which the distance Ia1 was measured, and the vertical angle was read. Thus we had two sides and the included angle of the triangle; however, as a check, the distance aa1 was measured. A similar operation was gone

plan and elevation of the plane of the strings can be drawn, and from these the horizontal distances between the different sections can be scaled off; or, knowing the angle of inclination of the two strings, we can calculate the distances horizontally. Each cross-section can be laid off accurately with triangle and T-square, and the area can be calculated in the ordinary way.

Having calculated the areas of all sections, and knowing the horizontal distance between each two, the volume of each prism can be obtained by the formula: Volume equals one-half the sum of the area of the two bases, multiplied by the altitude—the bases being any two adjacent sections, and the altitude the horizontal distance between them. The sum of all the volumes gives the total volume, up to the line across the two points A and B. From our previous work we have the location of these points A and B; to obtain the remaining volume, we set up our transit under either A or B and proceed to make cross-sections from our instrument in the usual way.

MINERAL IMPORTS AND EXPORTS OF SPAIN.—Imports of fuel into Spain for the nine months ending September 30th included 1,200,314 metric tons of coal and 149,137 tons coke. Imports of metals included 3,112 tons pig iron, 5,256 tons wrought iron, 38,035 tons steel, and 1,960 tons in-plates. Exports of minerals for the nine months are reported by the "Revista Minera" as below, in metric tons:

	1899.	1900.	Changes.
Iron ore	6,537,653	5,962,508	D. 575,145
Copper ore	735,452	785,933	I. 50,481
Zinc ore	70,522	45,333	D. 25,189
Lead ore	7,451	2,917	D. 4,534
Salt	275,411	164,087	D. 111,324

Exports of metals included 18,746 tons pig iron (29,877 tons, 1899); 19,680 tons copper (21,194 tons, 1899); 112,356 tons lead, against 119,853 tons in 1899.

*Abstract of paper presented at the Canadian meeting of the American Institute of Mining Engineers.

THE GATES TILTING CRADLE AND HOT-ORE WELL.

The accompanying illustrations show an improved form of hot ore well or forehearth mounted in position on a tilting cradle operated by hydraulic mechanism. The well is of very large capacity, made of heavy steel plate and mounted on strong steel rails operating on four truck wheels attached to heavy steel axles, with bearings mounted on heavy cast-iron pedestals. Two of the wheels are grooved to receive the rail and act as guide to hold the well in position and prevent it from shifting from one side to another. The mechanism used in tilting the well consists of a rack engaging a segment gear attached to the base of the cradle and operated by a hydraulic cylinder, as seen in the cut.

In Fig. 2 is seen another view of the apparatus, illustrating the method of dumping or tilting the well in discharging its contents. These wells and tilting cradles are made of any desired capacity. For large copper-smelting plants this style of forehearth is very convenient, and it is being rapidly introduced in Arizona and other large copper regions. It is designed and made by the Gates Iron Works, of Chicago.

ABSTRACTS OF OFFICIAL REPORTS.

Tomboy Gold Mines, Limited, Colorado.

A report just issued by this company covers the period of 10 months ending June 30th, 1900. The accounts, as stated in sterling from the London office show receipts from the mine, £93,334; interest, etc., £1,838; total, £95,172. The expenses in America were £58,053; in London, £3,662; total, £61,715, leaving a balance of £33,457. From this, two



FIG. 1.

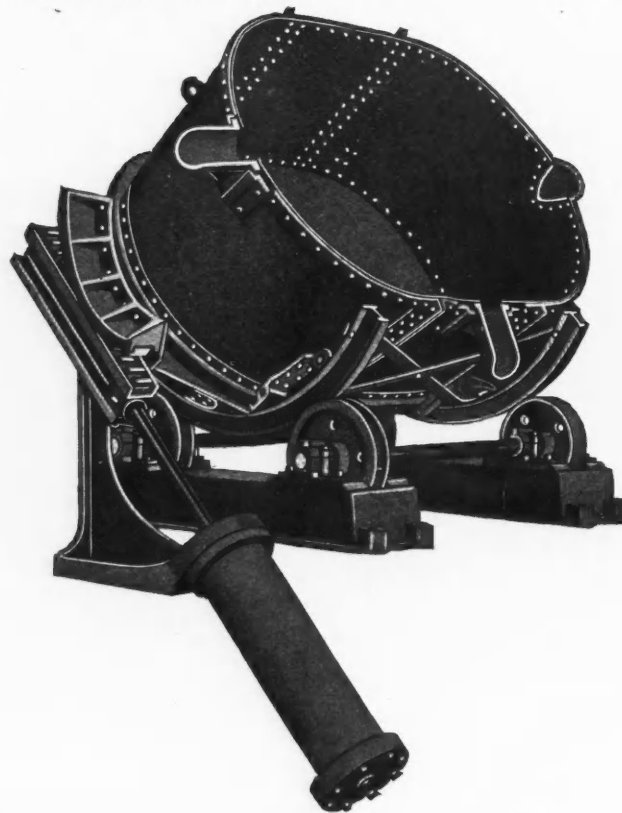


FIG. 2.

GATES TILTING CRADLE WITH HOT ORE WELL.

dividends amounting together to £30,000—being 10 per cent. on the capital stock of £300,000—were paid, leaving a balance of £3,457 to current account.

The manager's report gives the mine earnings and expenses, in dollars, as below:

	Total.	Per ton.
Bullion and concentrates, 46,716 dry tons ore milled.....	\$457,219	\$9.79
Crude ore sold, 72 tons.....	1,533	21.29
Rents, sales of material, etc.....	4,931	.....
Total receipts	\$463,683	\$9.91
Mining expenses	\$176,464	\$3.77
Milling expenses	87,250	1.87
General expenses	23,668	0.51
Improvement account	15,693	0.32
Total expenses	\$303,075	\$6.48
Net receipts	\$160,608	\$3.43

General Manager J. Herron's report says: "During the period referred to, the development work in the mine has been as follows: Drifts, 2,401 ft.; raises, 1,103 ft.; cross-cuts, 152 ft.; shaft sinking, 109 ft.; total, 3,765 ft. The greater part of this work has been done on the 300, 700 and 800 levels. Very much better progress could have been made had we not been handicapped by imperfect hoisting facilities. I am pleased to report the satisfactory installation of a large double drum hoisting engine, and our progress, especially in the lower levels, from now on, should be much more rapid.

"To all intents and purposes the ore above the 200 level is exhausted. Recently, however, in drawing from this portion of the mine, we have discovered considerable ore which appears to have been lost in caves. We think we may be able to recover probably 10,000 tons of a milling grade from these stopes. Over the 300 level we now have in sight about 50,000 tons, most of which is of good grade. This amount may be increased by further development on this level. Between the 300 and 600 levels, a very large tonnage (probably 200,000 tons) has been

opened up. With the exception, however, of occasional shoots of rich ore, this tonnage must be called low grade. Our comparatively high operating expenses preclude the possibility of milling very much of this ore under existing circumstances, but improved conditions will allow a large proportion to be milled at a profit. The ore between these levels varies in many respects from that in the upper mine, being much harder and without the gouge or talc on the hanging wall, which was so persistent in the old stopes. A short distance above the 600 level there seems to be a return of the well-known Tomboy characteristics, and although sulphide ore is seen in large quantities, the general appearance of the quartz coincides with that in the upper mine, and talc is again in evidence. This condition of affairs is still more marked below the 600 level. On the 700 level two ore-bodies have been opened up, which appear to have their apexes at or near the 600 level. In both of these the vein appears as in the upper mine, and there is still more resemblance to the productive ore of past years in recent developments on the 800 level, where the vein is stronger and more oxidized than it has been on any level below the 300. It is as yet too early to estimate the tonnage below the 600 level, but if the ore-bodies are as long on the 800 as on the 700, we should have at least 30,000 tons available, with prospects favorable for a larger tonnage and indications that the vein will be still better below the 800.

"No change has been made in the mode of treatment or in the machinery pertaining to the milling plant. Much has, however, been done in repair work and in bringing the mill up to the highest possible grade of efficiency. There have been a few delays on account of accidents to machinery, and the results obtained have been highly satisfactory.

"The company has obtained a bond on the Argentine, Red Cloud, Champion and Chieftain mining claims controlling the apex of what is known as the Elephant-Cincinnati-Argentine Vein. This is the strongest vein in the district, at least as far as surface indications are concerned. Very little work has been done on it, and all values heretofore found have consisted in small but very rich pockets of gold-bearing quartz. On the Red Cloud Claim, the vein shows a good grade of smelting ore, and we expect to find a milling grade of sulphide ore in drifting to the east from the Argentine workings. The work that we have done to date, although not showing a milling grade of ore, is encouraging."

As the manager's report extends only to June 30th, last, the directors deem it desirable to inform the shareholders that the developments which have taken place since that date have been of a satisfactory and encouraging character, particularly as regards the 300-ft. level east, and the 700-ft. and 800-ft. levels.

California Milling and Mining Company, Colorado.

The report just issued from this company's London office covers a period of 19 months ending July 31st, 1900. The total receipts, including £75,748 from the mill and leases, were £18,158; total payments, £17,987, leaving a balance of £171.

The directors' report says: "The directors have delayed calling you together until now in the hope that they might be able to report the completion of the sale of the California Mine and the consequent redemption of the debenture debt. As you are aware, the company was unable to work the mines to advantage for lack of the necessary capital. The last three years in particular have been a very anxious time for the

directors, since the mining and metallurgical conditions in Gilpin County have been very unfavorable. They now have to report that, owing to a disastrous fire at the California Shaft, and to a series of strikes and floods, the proposed sale of the mines has fallen through. The directors regret this failure for the sake of the company, and also for the sake of the intending purchasers. As regards ourselves, however, the forfeited deposit of £2,083 has sufficed to pay a part of the debenture interest during the long option period. The machinery is now more complete and valuable than it was when the option was originally granted, and as both it and the mines must now revert to the company, they can only be regarded as forming a most valuable asset. The directors see no present means of raising the necessary capital for draining and working the mines, but they are still on the lookout for a purchaser, and not without hope that they may yet be able to sell them with advantage, particularly as the completion of the deep tunnel, which is now being brought up from Idaho Springs, must within the next few years greatly simplify the drainage problem for the whole district.

"The supply of ore for our mill has not been maintained as well as we could have wished; in fact, we could have treated 50 per cent. more at a comparatively small increased cost had it been obtainable. We have indeed always been able to secure our fair share of the ore raised in the district, but floods and strikes have limited the quantities, so that our mill receipts have been seriously lessened. As we are now entirely dependent upon custom ore this is a very serious consideration for us, and we can only hope that we may soon be once more in full swing. The Margaret Glennan Mine, though it has yielded a considerable tonnage of ore for the mill, and so swelled the mill receipts, did not prove equal to our expectations, and the lease has been abandoned."

THE TELLURIDE-ORES OF CRIPPLE CREEK AND KALGOORLIE.*

By T. A. Rickard.

The lodes of Cripple Creek, Colo., partake of the composition of the geological formation which they traverse. The prevailing rocks are andesitic breccia, lying upon granite, and also bodies of phonolite, trachytic phonolite, nepheline-basalt, etc., penetrating both the granite and the breccia. At Kalgoorlie, in West Australia, the prevailing rock is schistose, and has not been certainly identified, though microscopic sections indicate the probability that it was originally an acid eruptive. The lodes are essentially bands, more highly schistose than the enclosing rock, and impregnated to a notable degree with disseminated pyrites and secondary calcite.

In chemical composition, the ores at Cripple Creek and Kalgoorlie, respectively, present differences equally interesting to the petrographer and the metallurgist. In both cases we have to deal with altered eruptives as the matrix of the ore; but the much older rock of Kalgoorlie has undergone more decomposition than that of Cripple Creek. To the metallurgist the difference is of greater importance, especially in the milling of the low-grade ores.

The Kalgoorlie schistose lodes carry only a small amount (2 to 12 per cent.) of alumina, the replacement of the feldspar having advanced very far, while, on the other hand, the impregnation of secondary carbonates of lime and magnesia, aggregating from 5 to 15 per cent., gives the ore a strong dolomitic ingredient. The silica contents average between 45 and 60 per cent. Titaniferous iron accounts for the presence of from 1 to 2.5 per cent. of titanate acid.

The Cripple Creek ore has a composition which approximates that of the prevailing rocks; and therefore the alumina is very high—from 15 per cent. in the granitic ores to 25 per cent. in those occurring with phonolite and its allied dike-rocks. Of lime and magnesia there is only from a trace of the latter to 4 per cent. of the former. The silica ranges from 55 to 70 per cent., being highest in the granitic ores. In sulphur and iron the two districts present no very marked difference, although there is more pyrite disseminated through the ore at Kalgoorlie than at Cripple Creek, the average percentage of sulphur being from 4 to 8 at Kalgoorlie and from 1.5 to 2 at Cripple Creek. The iron is a little higher in both, but in about the same ratio.

From a smelter's standpoint the Kalgoorlie ore is the better, being less silicious, and (what is more important) carrying a much smaller percentage of alumina. It is the practice in Colorado to limit the amount of alumina in the charge of the lead-smelting furnaces to about 5 per cent. The Cripple Creek ores, which carry about four times this proportion, are smelted only in limited quantities mixed with other ores, so as not to impair the fusibility of the slag. The absence of copper and lead in the ores of both districts does not affect the reduction by smelting; but it obviates difficulties which might otherwise arise in the wet treatment of the mills.

The dolomite in the Kalgoorlie lodes renders chlorination unsuitable as a method of treatment, on account of the fact that the lime and magnesia, resulting from the roasting of the carbonates, absorb the chlorine before it can unite with the gold, and thus prevent solvent action upon the precious metal until the former have been satisfied. On the other hand, the presence of the carbonates tends to neutralize the acidity due to the sulphatization of pyrites and renders the ore very amenable to cyanidation, the process now employed at Kalgoorlie. The schistose character of the lode-stuff causes it to slime easily in wet-crushing; and the mechanical difficulties arising from this fact have prompted the general adoption of dry-crushing, in order to expedite subsequent leaching and filtration.

The Cripple Creek ores are docile to cyanidation and chlorination alike. The latter requires, of course, a dead roast; and for this reason the cyanide process, which does not necessarily require the roasting of oxidized and partially oxidized ores, had an advantage in the early days of the district. Now, however, it is recognized that, apart from chemical reasons, it is economical to subject the oxidized ores to roasting,

on account of the resulting betterment in the leaching and filtering of the pulp.

Telluride ores have become an important source of gold during the past five years on account of the discoveries made in Colorado and West Australia. They have been treated as something quite new and phenomenal. As the result of the success of the two districts there grew up a notion that this mode of gold-occurrence indicates ore-bodies of specially persistent nature—a fallacy akin to the older one which assumes an enrichment with depth as a general characteristic of gold veins. Tellurides have been mined in Transylvania for a century; and they have been known in Colorado, as important ores of gold and silver, since 1872—two districts, the La Plata Mountains and Boulder County, yielding them in commercial quantities. In none of these regions have they been characterized by special continuity in depth. On the contrary, until Cripple Creek, and then Kalgoorlie, commenced to make a record, it was generally held, among those who were aware of the facts, that telluride ores were erratic in behavior and difficult to treat. The former proposition is not more true of them now than of gold deposits in general; while the latter has been largely modified by the advance of metallurgical practice.

As is well known, the tellurides, or combinations of tellurium with the metals, are similar to the combinations formed with sulphur and selenium. The first determination of this interesting group of minerals is due to Klaproth, who, in 1802, recognized them in the ores of Zalthna, in Transylvania. Tellurium is a non-metallic element. In its chemical combinations it acts in a manner analogous to sulphur, which it appears at times to replace. Native tellurium is a tin-white, brittle substance with a bright metallic luster. Its commercial value is \$3.50 per ounce; but the demand for it in the arts is very slight, and a few shipments demoralize the market, as is the case with most of the rare earths. It is extremely uncommon both at Cripple Creek and at Kalgoorlie, but in Boulder County, Colo., it is frequently encountered. A mass weighing 25 lbs. was found in 1877 at the John Jay Mine, near Jimtown. In Gunnison County, in Southern Colorado, it has lately been found at the Vulcan Mine, in mica schist, associated with a lode of gold-bearing pyrite, which, in the oxidized zone, includes masses of native sulphur.

Kalgoorlie affords the finest specimens of the telluride of gold, calaverite, in generous splashes of lustrous yellow, which glorifies the dull-looking schistose rock. Analyses yield nearly 42 per cent. of gold, with less than 1 per cent. of silver. The specific gravity is given as 9.377. At Cripple Creek, good specimens of calaverite are rare; but it occurs finely disseminated through the ores, although somewhat obscured by the presence of sylvanite. Analyses indicate the average composition as ranging from 38 to 40 per cent. in gold, with about 3 per cent. of silver. The specific gravity is given as 9. The Cripple Creek variety therefore makes a very close approach to Genth's original determination of the specimens from the Stanislaus Mine, in Calaveras County, California, the locality from which the mineral derived its name.

In Boulder County, Colorado, which yielded some of the earliest specimens, a splendid mass of calaverite was found in 1877 at the Melvina Mine by Henry Neirkirk, a Dutchman, who, while prospecting, drove his pick into a mass of soft, clay-like, unctuous material, and, on withdrawing it, found that it was gilded. The mass consisted of lemon-colored oxide of tellurium containing fine particles of amorphous gold, the two substances being the product of alteration from the bronze calaverite which Neirkirk found deeper down, associated with magnesite and fluorite. This dioxide of tellurium, or tellurium ochre, has been found in Transylvania. It is very rare because of its marked affinity for ferric salts, with which it forms a definite compound, the tellurite of iron.

The tellurite of iron, which Knight was the first to determine, has a light-brown color and a bright yellow streak. It occurs also in a specimen which I obtained at Kalgoorlie. As a mineral it has only an academic interest; but the chemical reactions of which it is the result play an important part in the treatment of telluride ores. Namely, in roasting these ores, the tellurium is not driven off with the sulphur, but, as soon as it has volatilized, it becomes oxidized to TeO_3 , and is fixed in the roasted charge by combining with the oxide of iron due to the calcination of the pyrites in the ore. What tellurium does escape, and is subsequently found in the flue-dust, is carried away mechanically by the draft. This is the experience of our reduction works. Mr. Richard Pearce has made laboratory tests to elucidate the matter, and has found that as much as 96.4 per cent. of the tellurium has remained in the ore after it had been roasted.

In nature a kindred action probably occurs, the decomposition of the gold-bearing telluride in the presence of oxidizing pyrite liberating the gold with the formation of the tellurite of iron. The gold, thus set free in a metallic condition, has characteristics which readily distinguish the surface ores of all telluride lodes. At Mount Morgan, it was found, in 1886, that the dull-looking gold would not amalgamate in the stamp-mill. Dr. Leibius, of the Mint at Sydney, decided, as the result of experiments, that the gold, which was of remarkable purity, was probably coated with an oxide of iron. In 1893, I remarked the similarity between the gold of the famous mine in Queensland and the specimens given to me at the Pike's Peak and Garfield Grouse mines, on Bull Hill, Cripple Creek; but it was not until 1897 that the resemblance was traced to a common cause, the derivation of the gold from tellurides. The soft, brown gold resulting from the alteration of tellurides has the appearance of gold precipitated from solution. Its pasty, spongy, but slightly compact character has caused it to be named "mustard gold" at Kalgoorlie. It occurs in splashes like yellowish clay, and can be detected by scratching, which burnishes it, so as to exhibit the unmistakable glint of the precious metal. At Cripple Creek, very perfect pseudomorphs after sylvanite and krennerite are obtainable. In the Gold King vein, patches of these can be seen in a series of quartz geodes, the gold looking, as the miners express it, "like splinters of rotten wood." Free gold at Cripple Creek has invariably that appearance which characterizes the metal when it has originated from the disintegration of tellurides; but at Kalgoorlie, ordinary gold, in a bright and crystalline condition, also occurs. It is usually in coarse particles, the size of which

*Abstract of paper presented at Canadian meeting of the American Institute of Mining Engineers.

hinders complete extraction by leaching and becomes a factor in the ore treatment. At most of the cyanide mills there are supplementary amalgamating tables, over which the tailings are conducted, after they have been discharged from the vats, so as to extract any of these larger particles which may have escaped solution. They would escape, not only by reason of their larger dimensions, but because they would lack that spongy character conducive to quick leaching possessed by gold which has resulted either from the alteration of tellurides in nature, or from their decomposition in the roasting furnace.

As to the special telluride minerals, sylvanite is the most common at Cripple Creek, though it does not carry the largest part of the gold. It is uncommon at Kalgoorlie. Petzite is not common in either district. At Kalgoorlie there have been found krennerite and also coloradoite, or telluride of mercury. At Cripple Creek fluorite characterizes the telluride ores. It does not characterize the lodes at Kalgoorlie; but calcite is a feature of their mineralization there, while it is rare at Cripple Creek. Roscoelite, which has a peculiar interest for the students of telluride ores, has been detected in some specimens from Kalgoorlie.

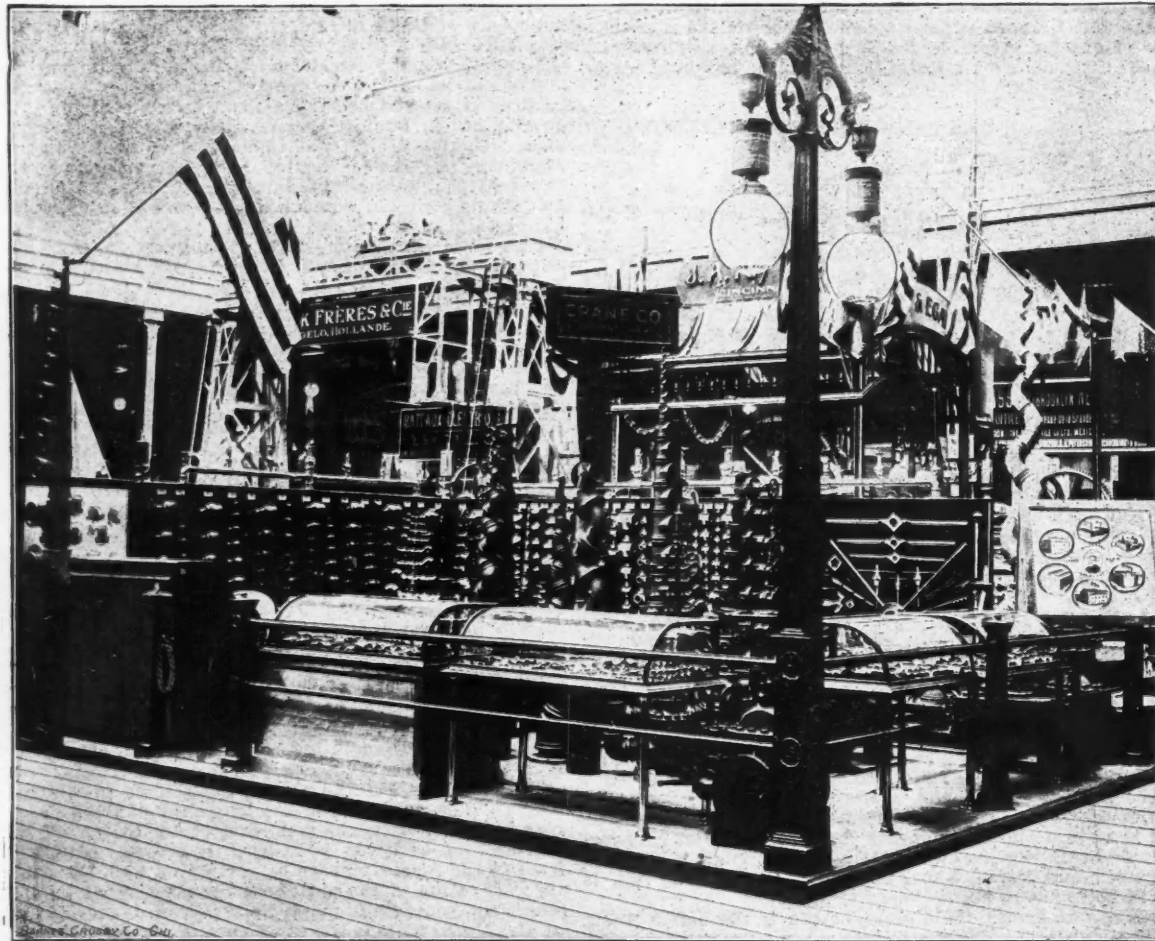
Roscoelite has not yet been recognized at Cripple Creek; but chlorite occurs freely, especially in the Elkton and Mary McKinney lodes. Various forms of chlorite are also in part responsible for the prevailing green coloration of the protogene of Boulder and the schistose bands of Kalgoorlie. Analytical tests might succeed in separating a particular variety as a characteristic of these ores. It is, to say the least, very suggestive that the telluride veins in the granite of Cripple Creek, the

ceive a gold medal. The exhibit was tastefully arranged, as will be seen from the accompanying photograph, and gave an especially good opportunity to visitors to study approved modern methods of piping, flanged work, etc., for power plants—a branch of the business of this company which has become very important.

A MICHIGAN COAL MINE.

Several years since the United Alkali Company, of England, looking for a location for the production of its chemical products for American consumption, settled upon Bay City, Mich., as the scene of its operations. This was done because of the saline deposits along the Saginaw River as well as the fact that the coal underlying the valley provides a supply of cheap fuel, says the "Michigan Miner." The North American Chemical Company was created as the offspring of the parent corporation. The company purchased the McGraw Salt Works in Bay City and began to prospect for coal. It has now more than twenty salt wells in operation and owns one of the finest coal mines in the country. No expense has been spared in fitting out the mine with the idea of producing the best possible results, and the interests of the miners have been considered to the extent that there is not in the United States a mining settlement that has been planned on the excellent lines conceived and carried out at this mine.

There are 23 cottages at the mine, 20 with 4 rooms, 2 being sleeping rooms and 2 for kitchen and dining-rooms; 2 are 6-room houses and



THE CRANE COMPANY'S EXHIBIT AT PARIS.

schist of Kalgoorlie and the protogene of Boulder, should all be characterized by the presence of chlorite. Of course, it may be regarded simply as the product of the decomposition of the biotite and augite in the prevailing country. Nevertheless, it remains an interesting coincidence.

The small amount of quartz occurring in these telluride veins is a feature worthy of notice. At Kalgoorlie a notable amount of quartz is considered an indication of poverty; at Cripple Creek there is more quartz; but it never predominates to the extent which marks the ordinary gold veins of California and Victoria. Much of the secondary quartz, as distinguished from the silicious ground-mass of the country itself, is hydrous and opalescent. This encrusts the cracks and cavities resulting from the most recent lines of disturbance. In Boulder County, the quartz takes the form of a dark flinty substance, the "hornstone" often referred to in descriptions of the lodes.

THE CRANE COMPANY AT THE PARIS EXPOSITION.

One of the exhibits at the Exposition in Paris which attracted wide attention was that of the Crane Company, of Chicago, whose standing as a very large manufacturer of valves and fittings is so well known. This exhibit occupied a desirable position in the Palace of Machinery and Electricity in the Champ de Mars, and consisted of brass and iron valves and cocks for all pressures, brass and iron fittings, steam specialties, engineers' supplies, and steam and gas fitters' tools. The Crane Company was the only exhibitor of this class of goods to re-

one 8 rooms, occupied by the superintendent, with barn. They are all neatly painted, there is 60 ft. space between them, and there are 7 wells along the avenue in front of the homes. At the mine there is a wash-house having accommodations for 64 men.

The operations at the mine are all confined to entry work. There is about 500 tons of coal taken out of the entries each week. The idea is to develop the mine to the best possible advantage before removing the coal generally. The vein at present averages 52 in. The equipment includes 10 hopper cars made expressly for the company, which deliver the coal at the alkali works. Several of the boilers at the works have stokers attached, in which case the coal is dumped into the hopper of the stoker direct.

The mules used in the mine are all brought to the surface at the close of each day's work. After the harness is removed, the animals go out in the open and roll on the ground with a relish, and then walk into their stalls and go to feeding. In this way the mules are kept in good condition.

An air-shaft has been started 300 ft. south and 175 ft. west of the main shaft. The company has had several inquiries of late and the prospects are that brick-making will be in vogue at the mine ere long. The company has one drill engaged in prospecting. When coal is reached on a land-owner's property, he is sent for so that he can see for himself what is taken out of the hole. Then a report is signed by the driller, the foreman and the owner of the land, so that no dispute can arise afterward.

J. E. Hawkins is the office manager at Bay City, Joseph Brown superintendent of the mine, and N. E. Dodge bookkeeper.

NEW IRON INDUSTRIES IN RUSSIA.*

In Southern Russia much attention is being given to the question of finding good and suitable deposits of iron ore for the requirements of its increasing iron industry in that part of the Empire. The Krivoy Rog deposits do not yield abundantly, and are, besides, in firm hands; but the researches for better and more convenient iron-ore deposits appear to be fairly successful. Deposits have thus been discovered close to Adshamki, in the Alexandrsk District, extending, so far as has been at present ascertained, to the villages of Pokrowsk and Klinzy. Rich deposits have also been found at Fedorowka, 40 versts from Nikolayew, on the borders of the River Bug. Extensive deposits have also been discovered at Seleny, in the Werchue-Dnieprowsk District, where about 6,400 dessiatines of land have been secured for exploitation. Huge deposits are found in this extensive area, more especially at the Waskowa Valley and at Narwina, on the left border of the Seloniaia. These ore fields will have connection with the new railway which is being built from the Koristowka station on the Charkow-Nicolaiew Railway, to the Piat-Chatka station on the Isaksagan Branch of the Iekaterine line. The station nearest the ore deposits will be that of Seloniaia. The whole of this territory has been let to a Russian syndicate for 22 years, with the right to build a railway to the station just referred to, a distance of about 1 verst.

Deposits of iron ore have further been discovered in the Dankowo District in the Government of Riasan. These have also been let to a company, which has already secured the contract of 10,000 dessiatines, and expect to acquire an additional territory of twice that extent. Also, on the Belgard estate, in the Iefremow District in the Government of Tula, large deposits of excellent iron ore have been discovered, the working of which has been transferred to Donetz Metallurgical Company, which intends to erect works for the utilizing of the ore on the spot. The company has undertaken during the first three years not to break less than 2,500,000 poods of ore annually, and from the fourth year not less than 7,500,000 annually, paying the owner 2 kopecks per pood. In the Liwny District of the Government of Orel, ore has been discovered over an area of 4,000 square versts. The ore is not particularly good, containing only some 45 per cent. iron; but it is considered sufficiently good for production of pig iron. Of a still inferior quality is some iron ore discovered at Ielissawetgrad, in the Government of Cherson, which averages only about 40 per cent. of iron. These recent and extensive findings of iron ore in Southern Russia have allayed the apprehensions of an impending ore famine.

New iron works and engineering establishments continue to be erected, although warning voices are at times heard that the thing may be overdone. The Bielanski Blast Furnace Company has erected blast furnaces in the Slawianoserbsk District on some land rented from the Bielanski Coal Mining Company. The company has also the right to carry on business as iron and steel masters and manufacturing engineers in other parts of the Empire.

Another undertaking, likewise with Belgian capital, is the Ateliers de Constructions, Forges, et Fonderies de Khartisk, which, likewise on rented land, is erecting various machine shops. Preparatory work for the building of a railway, which will, no doubt, be of much advantage to the iron industry, is at present being carried on by the Vladikavkas Railway Company, the contemplated line being one from Tschellabinsk-Orenburg-Zaryzin. This line will be the connecting link between the Siberian Railway and Southern Russia, and will undoubtedly give a new impetus to the metallurgical industry of the Southern Oural. The contemplated line passes through some of the richest deposits of magnetic and other kinds of iron ores, of manganese ore, coals, clay, etc., but which hitherto, on account of inadequate means of transport, have been compelled to remain more or less unexploited. The new line will be able to convey Siberian coke to the districts rich in minerals but poor in fuel, and a rapid development of metallurgical industry is looked for, navigable rivers in several industries affording additional transport facility.

The Ostrowice Iron Works had, during the last financial year, earned net profits of 1,228,684 roubles, or over 85 per cent. of the capital (1,500,000 roubles). The shareholders received a dividend of 40 per cent. The South Russian, Dnieprowski Metallurgical Company earned in the last financial year 4,132,054 roubles, or 83 per cent. of the capital (5,000,000 roubles). The shareholders received also in this case 40 per cent. dividend. These two companies are, of course, exceptions to the rule; most of the concerns in this branch in Russia give fair but by no means excessive dividends.

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.)

236.—Prisms for Polarizing Light.—J. L. M. writes that he has a very clear specimen of Iceland spar and wishes to make a polariscope analyzer and polarizer from it. He also says that he has seen reference to a "Razumovsky prism" which answers the same purpose as the Nicol, but is less wasteful of material in making, and wants advice. In reply we advise J. L. M. not to attempt making a Nicol prism unless he has means of cutting and grinding the mineral with exactness at definite angles, and has also some skill and experience at fine work, otherwise he will spoil his specimen to no advantage. We know of no book in English giving a full discussion of the Nicol prism and its various modifications, though articles on it may be found in various periodicals and magazines. Alfred J. Moses, in his "Characters of Crystals," p. 105, says: "A Nicol prism is made from a cleavage of calcite having a length about twice its thickness. The two small rhombic faces at 71° to the edge are

ground away and replaced by faces at 68° to the edge. The prism is then cut through at a plane at right angles both to the new terminal faces and to the principal section. The parts are carefully polished and cemented by Canada balsam. Various modifications of this prism have been made to decrease the cost and increase the field. The Foucault's prism uses a layer of air instead of Canada balsam and is cut at a different angle, requiring a shorter prism, but giving a smaller field. In the Hartnack prism, which is much used, the terminal planes are at right angles to the axis, the prism is shorter and the field reaches 42°. The Bertrand prism is of flint glass, with a high index of refraction. It is bisected by a plane at 76° 43' to the base, and between the two halves is a thin calcite cleavage, properly oriented. The field is about 45°." We advise J. M. L. to buy a Nicol from some dealer in optical supplies, or if he wishes his crystal cut, to send it to some such firm as the Bausch & Lomb Optical Company of Buffalo, N. Y.

We have never heard of the Razumovsky prism, but suppose it to be one of the numerous modifications of the Nicol to which Prof. Moses alludes.

237.—Supposed Infusorial Earth.—A. D.—The white powder is not infusorial earth, but is nearly pure calcium carbonate, leaving but little residue on solution in weak hydrochloric acid. Similar material is found in Michigan, and is used on an extensive scale in the manufacture of Portland cement. It is a marl.

238.—Sericite Schist.—H. B.—The soft grayish rock is a sericite schist. It was once a mica schist containing considerable pyrite. The mica has changed to sericite, the body of the rock to a talcy mineral and the pyrite to hematite. The rock originally may have been a shale. It is of little economic value, and we know of no market for it.

239.—Chlorite.—L. H. S.—The dark green crystals in the pieces of vein quartz are composed mostly of chlorite. The crystals have the crystalline form of hornblende, but not its hardness. The hornblende has partly changed to chlorite.

240.—Sand.—Veritas.—The "sand" contains considerable feldspathic material, and the few quartz grains present are not rounded. The material might be of use in the manufacture of brick or of pottery, but its value can be determined only by actual tests.

241.—Realgar.—We have received from the Mineral Creek Mining and Milling Company of Tacoma, Wash., a very pretty specimen of realgar—sulphide of arsenic. The company claims to have a large deposit of realgar and is installing machinery to develop its claims.

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.)

Carbonate of Soda.—Would you kindly inform me what the market price is for carbonate of soda, and also if there is a demand for carbonate of zinc at price quoted in the "Engineering and Mining Journal?" F. C. A.

Answer.—There is a demand for zinc carbonate at the prices quoted in our columns.

We do not give any quotation for carbonate of soda, as it is not sold in that form. Carbonate and sulphate of soda form the "natural soda," deposits of which are found in Wyoming and elsewhere, and are used as the raw material in manufacturing the commercial soda in its various forms.

Prices per Unit.—Would you kindly give me the meaning of quotations in units, as I have seen in your paper quotations of high-grade Western Blood quoted at \$2.15 and \$2.25 per unit f. o. b.? What is it per ton?—L. L.

Answer.—The usual quotation per unit is based on the percentage of the special element which gives value to minerals, etc., the unit being 1 per cent. To get the price per ton, the number of units must be multiplied by the price per unit. Thus, in the case you mention, the unit referred to is the unit, or percentage, of ammonia. If the content was 10 per cent., the price being \$2.20 per unit, the price per ton would be \$22; and so on.

Tin Ores.—Do you know of any place from which complex sulphide tin ores, containing antimony, arsenic, silver and lead, or any of them, can be obtained in large quantities?—S. V.

Answer.—In further answer to this question, which was first published in the "Engineering and Mining Journal" May 5th last, and to which several answers have already been received and published, Mr. C. W. Robbins writes from Custer City, S. Dak., as follows: "In answer to your correspondent, 'S. V.,' I wish to say that I have examined a property near Custer City, in Custer County, South Dakota, in which there is a vein 10 ft. in width in which the ore is a sulphide and carries, in addition to the gold and silver, tin, antimony and lead, together with 3 per cent. copper."

Uses of Magnetic Sand.—I desire information as to what uses magnetic sand has already been applied and to what use the separated magnetite can be put. If it can be used in any furnace, please state how. I enclose under separate cover a sample of the magnetite which I wish to introduce. This product has 99 per cent. magnetite and analyzes 72 per cent. iron with no impurities except trace of phosphorus and trace of sulphur; otherwise pure. Unlimited quantities are obtain-

*Abstract of article in London "Engineering."

able. Some way of using in the furnaces which does not require any agglomerating or lumping is desired. About what is its value?—R. A.

Answer.—If the magnetite obtained from your sand carries, as you say, 72 per cent. metallic iron, with only traces of phosphorus and sulphur, it ought to be good material for mixture with other ores in the blast furnace. Your best plan is to submit samples of it to some furnace managers. The value of the sand—if it proves acceptable—would depend very largely upon its location and the cost of transporting it to the points where it could be used.

Mesabi ores are for the most part fine and reach the consumer practically in the form of coarse sand. It is this which has been an objection to furnacemen, and which has caused the ores to bring a lower price than Old Range ores from the Lake Superior Region.

In the early history of iron making in this country the black sands have been used in making iron. In several places along the Atlantic Coast bar iron was made from these ores in charcoal forges. The objection to them has been that they usually contain a high percentage of titanium, which renders them useless for the blast furnace.

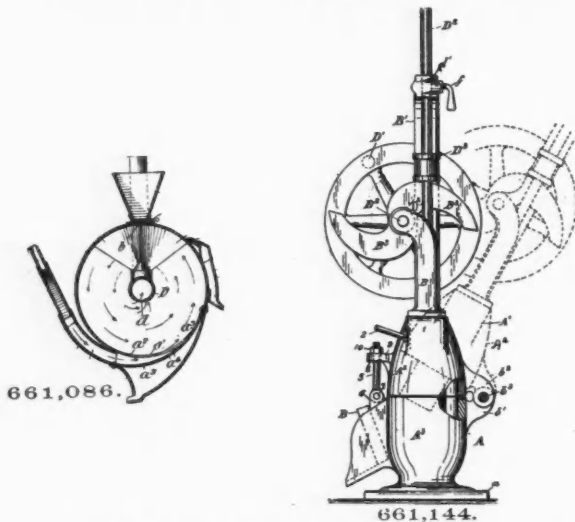
PATENTS RELATING TO MINING AND METALLURGY.

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 November 6th, 1900.

- 661,056. **FILTERING MATERIAL AND PROCESS OF MAKING SAME.** Max Jolles, Adolf Jolles and Julius Trenkier, Vienna, Austria-Hungary, assignors to Filterwerke Kuffler & Co., same place. The process consists in saturating an asbestos fabric with a solution of silicic acid or a silicate and a fluoride of the alkaline earths and rendering the coating insoluble and adherent to said fabric by means of heat.
- 661,074. **PROCESS OF EXTRACTING PRECIOUS METALS FROM THEIR ORES.** Henry J. Phillips, London, England, assignor to the Golden Link Consolidated Gold Mines, Limited, same place. The process consists in pulverizing the ores and subjecting the same in a closed vessel under heat to the action of vaporized chloride of sulphur.
- 661,080. **COAL SCREEN.** Hiram B. Sackett, Chicago, Ill. A combination of a screen portion, a regulating cut-off at the top thereof adapted to regulate the amount of coal flowing over the screen, a bagger removably attached to the lower end of the screen, a cut-off pivoted in said bagger, and means for holding the bag in place.
- 661,086. **ORE CONCENTRATOR.** Albert H. Stebbins, Little Rock, Ark. The combination of an outer cylindrical drum, a feed chute for feeding material to the inside of said drum, an exhaust cylinder centrally located in said drum, and having an opening therein on the side opposite the feed chute, an air-blast inlet extending the length of said drum and arranged substantially tangential thereto, and a discharge opening in the wall of said drum over which the blast is directed.
- 661,144. **ORE STAMP MILL.** Mark H. Hamm, Petaluma, and Henry R. Taylor, Oakland, Cal., assignors to the John Taylor & Company, San Francisco, Cal. The combination with the mortar comprising an upper and lower section, a hinged connection therebetween, of

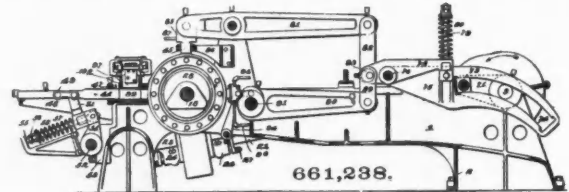


a stamp working within the mortar, the standards or uprights secured to and projecting from the upper section of the mortar, the stamp-stem extending through an opening in the upper section of the mortar, a tappet-cam secured to a cam shaft working in bearings of the uprights or standards, device for frictionally locking the stamp-stem, and of a water and an ore-feed opening formed in the upper section of the mortar.

- 661,109. **PROCESS OF MANUFACTURING PIPES.** Albert Schmitz, Dusseldorf, Germany. The process of manufacturing pipes with longitudinal partitions, which consists in placing a profiled bar upon a sheet-metal strip and simultaneously drawing both through a die, thereby causing the strip to form a tube around the bar.
- 661,184. **AMMONIA COMPRESSOR.** James T. Ludlow, San Francisco, Cal., assignor to the Vulcan Iron Works, same place. The combination of a casing, an adjacent cylinder, a piston therein, a guide chamber opposite said cylinder, a piston rod for said piston carrying a guide rod working in said guide chamber, said rod having an oil duct adapted to receive oil from said chamber and carry it to the drive connection, and power connections for driving said piston rod.
- 661,188. **PROCESS OF SEPARATING METALS FROM THEIR COMBINATIONS.** Anton Netti, Prague, Austria-Hungary. The process consists in causing a mercury electrode to continually fall freely by gravity in a plurality of finely-divided streams through the body of the electrolyte, and passing an electric current to the mercury

as cathode through an electrolyte containing a metal capable of combining with such mercury cathode.

- 661,193. **SUBAQUEOUS DREDGER.** William W. Priestley, Smartsville, Cal., assignor of one-half to Gustave A. Kornberg, San Francisco, Cal. In dredging apparatus, a revoluble barrel or tube provided with interior helical passages, adjustably mounted in slings and driven by traction of the same.
- 661,197. **CONVEYOR.** Sidney J. Sydney, New Orleans, La. The combination with a frame, of an adjustable arm carried at one end of said frame, conveyor baskets carried upon said arm and frame, means for transmitting motion to and supporting said baskets, an auxiliary feeding mechanism carried by the adjustable arm, and means for driving the same.
- 661,217. **ROTARY KILNS.** Paul O. von Krottnaurer, Berlin, Germany. The combination with the inclined rotary burning chamber, of means for the admission of the material to be burned situated at the higher end of said chamber, and the lower end of the same being open for the discharge of said material, a flame inlet situated at said lower end of the chamber, and a heat-refracting body extending longitudinally within said chamber.
- 661,238. **MACHINE FOR FORMING PULVERIZED MATERIAL INTO BRIQUETTES.** Thomas A. Edison, Llewellyn Park, N. J. The combi-



nation of a mold, a plunger co-operating therewith, a divided lever for moving said plunger, and a safety spring uniting the sections of said lever.

- 661,247. **PROCESS OF REVIVIFYING OLD PLASTER OF PARIS.** William R. Johnson, New York, N. Y., assignor to himself and George Nichols, Leicester, England. The method of revivifying plaster of paris by subjecting the same to two heatings and an intermediate wetting with acidulated water, the first heating effecting a more complete removal of water than the second, while the intermediate wetting serves to rehydrate the burnt plaster.
- 661,340. **MEANS FOR ELECTROLYZING LIQUIDS.** Albert R. Grever, Philadelphia, Pa. The combination with a receiver and a supply pipe connected therewith, of electrodes in the supply pipe in advance of said receiver, and electrical connections for said electrodes, together with a valve in said pipe, and means whereby the said connections are controlled by said valve.
- 661,362. **COMPOSITION FOR PAVING, ETC.** Henry F. Williams, San Francisco, Cal. A composition consisting of asphaltum, and lime sludge from purification of beet juice in sugar manufacture, the same being calcined limestone which has taken up carbonic acid in the purifying process.
- 661,401. **PROCESS OF STORING EXPLOSIVE GASES.** Edmond Fouche, Paris, France. The process consists in filling the receiver with a porous substance provided with numerous separate small bores or perforations, filling the pores and perforations of said substance with a suitable liquid, and then compressing the gas into the said receiver, whereby it will be absorbed by the liquid and be stored in isolated quantities in said substance.
- 661,406. **PROCESS OF HARDENING, PURIFYING AND TOUGHENING METALS.** Charles L. Leiby, Knoxville, Tenn., assignor by direct and mesne assignments to the Leiby, same place. The process consists in reducing metals to a molten state and introducing therein potassium nitrate, a cyanide and powdered silica.
- 661,407. **PROCESS OF MAKING METALS WELDABLE AND MALLEABLE.** Charles L. Leiby, Knoxville, Tenn., assignor by direct and mesne assignments to the Leiby Company, same place. The process consists in placing metals in a vessel with a compound of potassium nitrate and a cyanide in about the proportion of 1 lb. of potassium nitrate to 10 grains of cyanide, and of a quantity sufficient to immerse said metal when fused, and subjecting the whole to a heat sufficient to fuse said compound, and allowing said metal to remain in said vessel a period of time, subject to the chemical action of said compound.
- 661,443. **PROCESS OF PRODUCING ARTIFICIAL STONE.** Emery Coulon, Biaton, Belgium. A process which consists in crushing sand and lime to impalpable powder, mixing these materials and submitting the mixture to the action of electricity, the moistening effect of hot water and pressure by the latter equally to the top and to all sides of the block, the lateral inward pressure fully counterbalancing the downward pressure and preventing all disintegrating action while compressing the block.
- 661,445. **GAS PRODUCER.** Edward J. Duff, Liverpool, England, assignor of one-half to the United Alkali Company, Limited, of the same place. In a gas producer, a grate consisting of grids arranged in inverted V-form, bearings for the lower edges of the grids, a support against which the upper edges of the grids normally rest, a spindle adapted to be operated from outside the furnace, and means such as a projection or hammer on said spindle having freedom of movement between the upper ends of the grids and adapted upon rotation of the spindle to strike the grids and move them outwardly in opposite directions.
- 661,470. **ROLLING MILL.** Joseph Fawell, Pittsburg, and Joseph E. Schwab, Duquesne, Pa. In a rolling mill having in combination lifting mechanism independent of the roll-adjusting mechanism mounted on the roll housing, and means for detachably connecting the lifting mechanism to both rolls.

GREAT BRITAIN.

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

Week Ending October 13th, 1900.

- 19,421 of 1899. **ROCK DRILLS.** W. D. Jones, W. O. Pierce and W. M. Treglown, London. Method of rotating the drill of rock drills.
- 21,787 of 1899. **CRUCIBLE FURNACE.** A. Reynolds, Sheffield. A furnace for smelting, out of contact with furnace gases, consisting of a number of vertical tube crucibles.
- 24,659 of 1899. **COKE CONVEYOR.** M. Graham, Leeds. Conveying troughs on chains for conveying hot coke from ovens.
- 10,381 of 1900. **FUSE IGNITER.** A. Kuxten, Solingen, Germany. Igniters for blasting and mining fuses.

Week Ending October 20th, 1900.

- 21,252 of 1899. **HYDRAULIC COAL RAM.** J. Lacroix, Paris, France. Hydraulic machines for forcing down coal, etc.
- 12,599; 12,600 and 12,601 of 1900. **MAGNETIC SEPARATORS.** E. Gates, Chevy Chase, Maryland, U. S. A. Electromagnetic separators for diamagnetic substances, such as gold and silver, from quartz.

PERSONAL.

Mr. J. M. Gibson, mining engineer of Hamilton, Ontario, is in New York City.

Mr. L. D. Cloud, of the La Democrata Mine, Mexico, has returned there from Nogales, Ariz.

Mr. Richard Stanford is examining mines in Tuolumne County, Cal., for a New York company.

Mr. J. S. Hanna, of the Sacramento Mining Company, Eureka, Cal., has gone to Bloomington, Ill.

Mr. M. J. Heller, one of Capt. J. R. De La Mar's staff, has returned to San Francisco, Cal., from the East.

Mr. Richard A. Parker, mining engineer of Boston, Mass., is in San Francisco on professional business.

Mr. Henry C. Bratnober, mine expert, is in San Francisco, Cal., where he will probably make his home.

Mr. Elisha Hampton succeeds Mr. F. M. Manson as superintendent of the Banner Mine in Nevada County, Cal.

Mr. E. Milliken, of Milliken Brothers, New York City, builders of iron and steel structures, has gone to South Africa.

Mr. Herbert Murray, a California mining man, who has spent the past 2 years at Nome, Alaska, has returned to San Francisco.

Mr. Lawrence Harris, formerly of the Revenue Mine at Norris, Mont., who has been at Nome, Alaska, recently returned to Butte.

Mr. R. H. Flaherty, formerly manager of the Golden Star Mine at Mine Center, Ont., will take a lucrative position in Colorado.

Mr. T. H. Oxnan, ex-superintendent of the Bully Hill Mines, of Shasta County, Cal., has returned to San Francisco from France.

Mr. H. Gee, of the firm of Wilfley & Gee, concentrator men, of Washington Camp, Ariz., will visit the Gold Hill Mines of North Carolina.

Mr. Hartwig A. Cohen, general manager of Capt. J. R. De La Mar's interests on the Pacific Coast, is at the copper mines in Shasta County, Cal.

Mr. W. C. Brace, mining and metallurgical engineer of Denver, Col., has been in the Black Warrior District of Arizona on professional business.

Mr. W. G. Newman, of Union Copper Company fame, when last heard from was looking after mining interests in South America. He will return to New York shortly.

Mr. Herbert C. Hoover, the American mining engineer who had charge of the coal mines at Chi-Li, in the Province of Tien-Tsin, China, has returned to New York City.

Mr. Frank B. Turner, formerly owner of the Madisonian Mine in Montana, is at Prescott, Ariz., and will soon go to Kingman to examine some property in which he has lately become interested.

Mr. Arthur E. Light, chief engineer of the Gold Coin Mine, at Victor, Colo., is receiving much credit for planning the new building now being built on the site of those destroyed by fire over a year ago.

Mr. C. W. Pritchett, mining engineer, who, for the past 7 years, has been practicing his profession in the City of Mexico, has lately established himself in Denver, Colo., with office in the Mining Exchange Building.

Mr. Luther Wagoner, chief engineer of public utilities of San Francisco, Cal., has almost recovered from the accident which resulted in breaking his leg. Mr. Wagoner is part owner of the Francis Mine, in Mariposa County, Cal.

Messrs. C. A. Grasselli, Daniel Bailey and William J. Bever, of Cleveland, O., were in the Birmingham, Ala., district 3 or 4 days last week looking after their chemical plant about completed 5 miles below Birmingham, at Powderly.

Mr. A. J. Riley, mining engineer and superintendent of the Pratt Mines division of the Tennessee Coal, Iron and Railroad Company, is a member of the Alabama Legislature and chairman of the committee on Mining and Manufacturing.

Mr. H. J. Reiling, of Chicago, is in San Francisco, Cal. He was the first to build a successful gold dredging machine at Bannack, Mont. He is now having a dredge that was built by the Risdon Iron Works, of San Francisco, shipped to Western Africa.

Mr. H. Bow, mining inspector in the Rainy River District, has resigned his position with the Bureau of Mines to accept a position with

the Anglo-Canadian Gold Estates, an English syndicate operating in the Rainy River District under the management of Mr. Alan Sullivan.

Mr. J. C. Mabin, Jr., of New York, son of Mr. J. C. Mabin, the wealthy industrial stockholder, who is interested in the Sloss-Sheffield Steel and Iron Company, has gone to the Birmingham, Ala., district and accepted a position with that company in the engineering department.

Mr. S. E. Bretherton has returned to Denver, Colo., after several months' absence on professional business in Arizona and New Mexico. He has been appointed consulting engineer of the Kendrick-Gelder Smelting Company, which is at present building a smelter at Silverton, Colo.

Mr. C. G. Memminger, superintendent of the Palmetto and Tiger Bay phosphate companies in Polk County, Fla., has, it is said, resigned his position to accept one with a phosphate company in Tennessee. Mr. Memminger has constructed 2 of the largest phosphate plants in Florida.

Mr. F. D. Baker, mechanical engineer of Denver, Colo., has gone to South Chicago to superintend the erection of an automatic sampling mill for the American Smelting and Refining Company at that place. Mr. Baker is giving especial attention to the continuous automatic sampling of ores.

Mr. J. W. Copeland, of St. Paul, Minn., has gone to Denver, Col., where he will represent as exclusive sales agent there the same accounts as he has represented in St. Paul for the past 2 years. Among them are the Braeburn Steel Company, of Braeburn, Pa.; C. G. Hussey & Company, of Pittsburg, Pa., and others.

OBITUARY.

Henry Elling, a prominent citizen of Madison County, Mont., died in Helena on November 10th. He was born in Germany in 1842 and came to this country when a boy. He opened a store in Virginia City, Mont., in 1864, and by degrees became a wealthy man. He was interested in many mining properties.

J. H. Bowden, of Wilkes-Barre, chief engineer of the anthracite coal mining companies controlled by the Pennsylvania Railroad, died at Meadville, Pa., on November 16th. He was born at Pengeance, in Cornwall, England, in 1846, and came to this country when a small child with his parents. The latter settled in Tamaqua, Pa., where he was reared and received his elementary education. He was apprenticed to the machinists' trade at the shops of Carter & Allen at Tamaqua and completed his trade in Philadelphia, where he afterward attended a technical school, becoming a mechanical engineer. He came to Wilkes-Barre in 1869 and was made superintendent of the Wyoming Valley shops. In 1872 he formed a partnership with Major Irving A. Stearns under the firm name of Stearns & Bowden as general engineers. In 1873 he accepted the position of chief engineer of the Susquehanna Coal Company, and later became the chief engineer of all the coal companies connected with the Pennsylvania Railroad Company. He was borough engineer of Nanticoke, Pa., from the time of its incorporation until lately. He was one of the first members of the American Institute of Mining Engineers, and was a prominent member of the American Society of Mechanical Engineers.

Mr. Bowden held several patents, the most prominent being the Bowden self-oiling car wheel, now extensively used in the anthracite region. Mr. Bowden was a recognized engineer of great ability and was esteemed highly by the coal companies by whom he was employed. He recently completed, to be published in the forthcoming history of the Pennsylvania Railroad, an exhaustive record of the anthracite coal mining industry of Pennsylvania, as well as a history of all the coal companies now under the management of the Pennsylvania Railroad. This work he finished recently but did not live to see its publication. It comprises a record of the anthracite industry from the time of the first shipments to the year 1900.

Mr. Bowden was twice married and leaves a widow and 3 children.

George Clementson Greenwell died recently at his residence in Duffield, near Derby, England. He was an eminent mining and civil engineer, and was known as the author of Greenwell's "Mining Engineering," which, from the date of its first publication in 1850 to the present time, has been a standard work on coal mining. He was a member of the Institution of Civil Engineers, and a Fellow of the Geological Society; and was a past president of the Lancashire & Cheshire Coal Association, the North of England Institute of Mining and Mechanical Engineers (of which he was one of the founders), and of the Manchester Geological Society.

Mr. Greenwell was born at Newcastle-upon-Tyne on July 25, 1821. In 1837 he became a student at the University of Edinburgh, where he

remained until the beginning of April, 1838, and on June 2 following he was bound apprentice for 4 years to the Haswell Colliery. Mr. Greenwell entered upon the responsibilities of his profession in January, 1844, when he became resident viewer at Blackboy and West Auckland Collieries under Mr. T. E. Forster. In October, 1848, he received the appointment of viewer to Messrs. John Bowes and Partners, at Marley Hill and Crookbank Collieries in the county of Durham, to which duty the charge of Farnacres (afterward named Norwood) Colliery was added in 1849.

In this year, 1849, he published his well-known "Glossary of Terms Used in the Coal Trade of Northumberland and Durham," and, at the request of the Newcastle College of Practical Science, gave a series of lectures on mining. These lectures formed the nucleus of "A Practical Treatise on Mine Engineering," which was first published in parts, commencing in 1850, a second edition appearing in 1869, and a third edition in 1889. In 1852 Mr. Greenwell assisted in the formation of the North of England Institute of Mining Engineers. The first president was Mr. Nicholas Wood, and Mr. Greenwell was a member of the council. In 1853 he became sole manager of the collieries at Radstock, Somersetshire, belonging to the Countess of Waldegrave, where he remained until 1863, when he took the management of the Poynton and Worth Collieries, in Cheshire, belonging to the Right Hon. Lord Vernon. After 16 years at Poynton, Mr. Greenwell resigned his appointment as resident mining engineer, and devoted himself to consulting practice only.

In February, 1877, Mr. Greenwell removed to Tynemouth, Northumberland, where he continued to reside until the beginning of 1882, when he again removed to Duffield, Derbyshire, where he remained. His death brought to a close an active career of over 60 years as a mining engineer.

SOCIETIES AND TECHNICAL SCHOOLS.

Montana School of Mines.—The school trustees have recently received some good mineral specimens for the school cabinet. H. V. Winchell, geologist for the Anaconda Company, donated 2 specimens of feldspar, 3 fine quartz crystals, a fine specimen of graphic granite and 2 crystals remarkable for their size. Reynolds & McDowell, of Butte, donated some valuable specimens of malachites on native copper. The Anaconda Copper Company has donated the school an apparatus for cutting thin sections of rock, which has been used in some of the hearings that have taken place before the courts in suits that the companies were interested in. The faculty has decided not to purchase any private cabinet or collections that are not of practical value.

Montana Society of Engineers.—The regular monthly meeting of the society was held at Butte November 12th, with 12 members present. Charles H. Davis, of New York, was elected to membership.

The nomination committee reported the following to be voted on as officers for the ensuing year: For president, Frank L. Sizer, of Butte; for 1st vice-president, Aug. Christian, of Butte; for 2d vice-president, George T. Wickes, of Helena; for secretary and librarian, Richard R. Vail, of Butte; for treasurer, Joseph H. Harper, of Butte; for trustee, B. H. Dunshee, of Butte.

A general discussion relative to the place for holding the annual meeting in January, 1901, ensued, during which Anaconda, Missoula, Butte and Great Falls were mentioned as suitable places. President Blackford finally issued a call for a special meeting for November 24th to definitely settle the matter.

INDUSTRIAL NOTES.

The Charles Efros Trading Company of New York City has changed its name to the Charles Efros Steel Company.

The plant of the McMyler Hoisting Engine Works is to be removed from Cleveland to Warren, O., and work on the foundations for the new building will start at once.

The American Bridge Company is furnishing from its East Berlin, Conn., plant the steel work for power station No. 3 for the Hartford Electric Light Company at Hartford, Conn.

The Lycoming Calcining Co. is building a \$40,000 mill at Garbutt, N. Y., for the manufacture of stucco, which will be in operation in about 30 days. The company will obtain its gypsum from beds owned by J. W. Garbutt.

The Orford Copper Company, to do away with the many complaints about the fumes from its smelting plant at Constable Hook, N. J., will, it is stated, build a great chimney 40 ft. square at the base and about 400 ft. high.

The Powelton furnaces at Saxton, Bedford County, Pa., idle for nearly 10 years, have recently been rebuilt and will be put into blast.

The Saxton Furnace Company, Charles H. Scott, of Philadelphia, president, is operating them.

The Niagara Falls Power Company's initial installation in the new power station at Niagara Falls will consist of six 5,000-H. P. dynamos, and the contract for their construction has been awarded to the General Electric Company of Schenectady, N. Y.

The McKiernan Drill Company is to locate in Dover, N. J. The new concern has acquired the lease of a building. The work of putting in machinery will begin as soon as the place is vacated by the present occupant and the plant will be put in operation about January 1st.

All records for rod rolling in continuous turns were broken recently at the Rankin Works of the American Steel and Wire Company, Rankin, Pa., when the day turn turned out 500,660 lbs. of No. 5 rods. The night turn followed with 515,050 lbs., while the day turn next day made 533,710 lbs. This rod record is away above anything ever done in rod rolling.

The Gardner Electric Drill and Machinery Company is a new corporation with a capital stock of \$1,000,000, at Denver, Colo., which is arranging for the purchase of a site on which to build a plant for the manufacture of tools and machinery. The most important patents controlled by the company are those covering the Gardner electric rock drill and electric hammer.

The Iroquois Iron Works, South Chicago, Ill., is greatly enlarging its plant. A number of new buildings are being erected, including a boiler house, engine house and cast house; also coke and limestone bins, involving a large tonnage of structural steel and plates. All the steel frame construction and plate iron work was awarded to Wm. B. Scaife & Sons, Pittsburg, Pa.

The American Bridge Company has closed a contract with the North German Lloyd Steamship Company for the erection of 2 steel buildings on the banks of the river Weser at Bremen, Germany. The machine shop building will be 100 ft. wide, 300 ft. long and 2 stories high. The foundry building is 75 ft. wide and about 600 ft. long. Both buildings are designed after the best American practice. The contract has been secured by the American Bridge Company in competition with the best German bridge shops.

The Jackson Drill and Manufacturing Company, of Denver, Col., gives notice that the agreement of license from the Jackson Drill and Manufacturing Company, sole owners, for the manufacture and sale of the Jackson hand power rock drill, in eastern United States and foreign countries, heretofore held by the Thornton N. Motley Company, of New York City, is terminated. The company says that all persons are cautioned not to manufacture these drills; nor to purchase them, excepting directly or through authorized agents.

The Carnegie Steel Company of Pittsburg, Pa., has contracted with the new American Bridge Company to supply 5% of the steel needed for bridge building during a term of years. The contract is made on the same basis as that made with the Pressed Steel Car Company. The Carnegie company, it is said, refused to sell its Keystone Bridge plant until an agreement was reached on the furnishing of material. The Carnegie Company has used the Keystone Bridge Company to erect all its own bridges and steel structural buildings. This work will be turned over to the American Bridge Company.

The negotiations toward a reorganization of the Pratt & Whitney Company by the principals of the Niles-Bement-Pond Company are completed. The new company, who will retain the name of the Pratt & Whitney Company, is incorporated under New Jersey laws, with a capital of \$2,750,000, of which \$1,225,000 is to be 6% cumulative preferred stock and \$1,525,000 common stock. The original company was a Connecticut corporation, with an authorized issue of \$2,000,000 of 8% cumulative preferred stock and \$1,000,000 in common stock. Of the preferred only \$1,750,000 was issued. Holders of old Pratt & Whitney preferred stock receive 70% in new preferred stock and 30% in new common stock, the latter to be purchased by the Niles-Bement-Pond Company at \$10 per share, which price will also be paid for the original \$1,000,000 of Pratt & Whitney common.

The Colorado Iron Works, of Denver, Colo., is building some double-deck safety mine cages for the Portland Mine at Cripple Creek and has shipped to the Rocky Mountain Smelting Company at Florence, 2 large furnaces and a sampling plant. It is making a 36 by 60 copper matting furnace for Ladd & Tilton, of Idaho, and will supply all the accompanying equipment; and has taken from the Cochiti Reduction Works at Cochiti, N. M., an order for a complete 10-stamp mill. All the machinery for the Kendrick-Gelder pyritic plant at Silverton, Colo., has been shipped. Among other orders recently taken may be mentioned a set of 27 by

14 crushing rolls with elevators, screens, etc., for the Sunnyside Mining Company, of Georgia; a complete holsting plant for the Middlemarch Copper Company, of Arizona; a 36 by 68 silver-lead stack, with Nesmith patent water vaporizer, and an English cupelling furnace and equipment; a 48-in. round copper furnace for the Hoffman Smelting and Reduction Company with all attachments; a carload of water jackets for the Guggenheim plant at Aguas Calientes, Mexico; 11 sets of Bruckner roaster gears for the Globe Smelter in Denver, and a reverberatory matte storage furnace, for the Tezintlan Copper Company, Pueblo, Mexico. The firm is also turning out from 20 to 30 Bartlett concentrating tables per month, a number of which went recently to the Helena & Livingston Smelting Company at Helena, Mont.

TRADE CATALOGUES.

Williams Brothers, Ithaca, N. Y., have published an illustrated catalogue of more than 70 kinds of well-digging machines, operated by either horse-power or steam. This catalogue, they state, will be sent free to any one. These machines are said to be so simple that any person of ordinary mechanical skill can erect them, keep them in order and operate them either in the softest soil or through solid rock. They are mounted for traveling from field to field.

Flexible metallic tubing for technical purposes of all kinds in mines, mills or factories is described in a neat 16-page pamphlet published by Sharp, Klumph & Sisson, of Chicago, Ill. This tubing is stated to be made of hardened bronze and galvanized steel tapes, rolled in spiral form with overlapping edges. A packing is enclosed in the metal lap as rolled and is thus protected from internal or external wear while making the tubing perfectly tight. The tubing is said to be suited for conveying water, air, steam, oils or petroleum, and will stand pressure up to 350 lbs. per square inch. The tubing is also adapted to be used as armoring for electric wires.

A fine example of what a trade catalogue should be is that describing the electric and compressed air coal mining machinery made by the Jeffrey Manufacturing Company, of Columbus, O. This catalogue, No. 17, comprises 96 pages and was evidently compiled for the Paris Exposition, as it is printed in 3 languages—German, French and English. The illustrations are excellent, particularly those showing the Jeffrey self-propelling cutter at work in a 3-ft. seam of coal. Other illustrations show the loads hauled by Jeffrey electric locomotives—full specifications of the locomotives being given in tables. Electric pumps, drills and coke oven larries are also shown.

The Raymond roller mill is described in a catalogue, No. 2, issued by the Raymond Brothers' Impact Pulverizer Company, of Chicago, Ill. The company says that this mill is especially adapted for the reduction of all hard, refractory ores, cements, phosphate rock, ocher, graphite, talc, soapstone, limestone, marble, gypsum, coke coal, fuller's earth, barytes, copper, zinc, lead ores, carbon, glass, shale, slate, chalk, lime, burnt tile, sewer pipe, all burnt clays, dry clays, bauxite, cryolite, borate of lime, borax, sand, pumice stone, etc. When fine, dry pulverization is desired, the Albert Raymond vacuum separator is attached to the mill direct. With the 2 combined the entire product can be made any fineness required, and there will be no tailings or waste. The different degrees of fineness are obtained simply by reducing or increasing the air current.

Catalogue No. 96, published by the B. F. Sturtevant Company, of Boston, Mass., is a 132-page pamphlet describing the company's steel plate fans. The company states that the steel plate fan is now recognized as the standard type for general purposes of ventilation, heating and mechanical draft where a large volume of air is desired without excessive speed or pressure. The company manufacturers over 75 styles and sizes of these fans from 18-in. to 180-in. in diameter, adapted to all varieties of work. For mine ventilation the cone ventilating wheel may be used. The various types of fans are arranged to be driven by a pulley, by a steam engine or by an electric motor. The company calls especial attention to the various forms of steel plate electric fans which, it states, are constantly finding new adaptations as the use of electricity is extended.

Balances for assayers and chemists are shown in an illustrated pamphlet published by Wm. Ainsworth & Sons, of Denver, Colo., for whom John Taylor & Company, of San Francisco, Cal., are Pacific Coast agents. The balances made by the Denver firm range in finish and cost from a portable pulp balance having a sensibility of 1 mg. and priced at \$15 to a precision balance having a sensibility of 1-500 mg. and priced at \$300. Particular attention is called to the firm's button balances which contain several improvements, the most important being: (1) a new ad-

justing device—a 5-pointed star wheel mounted on a center edge back of the beam making it possible to place the rider over the center of the beam; (2) a new skeleton hanger very light and not liable to collect dust; (3) a rider rod lock that overcomes the annoyance of having the riders thrown off the arms or bent while covering or unlocking the balance. A list of users of Ainsworth balances contains the names of many of the foremost mines, metallurgical works and technical schools in this country.

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.

ARIZONA.

Graham County.

Arizona Copper Company.—This company reports the production of its mines at Clifton at 890 short tons of copper in the month of October.

Mohave County.

Mineral Park District work and prospects are reported better than for several years. Among the mines that are shipping are the Lone Star, Lady Bug and Home Pastime. The first named has recently installed a new steam hoisting and pumping plant and on the main lower level is working 3 shifts of men and in all other parts of the mine 2. The ore is of high grade character, and shipments are 4 car-loads a month. These are in that district also, 2 companies working and developing turquoise mines. The turquoise mine of James Haas has been in operation more than a year.

Gracey.—At this gold camp near Cottonwood land on the Colorado River is a new reduction works of 45 stamps capacity. The mine, it is said, has a ledge of ore from 20 to 30 ft. wide. Through this wide body of oxidized dirt are a number of stringers of rich ore, but all is milled together and averages about \$30 to the ton.

Maguire.—The California company which bought this gold mine 4 miles west of Kingman is having a 50-ton concentrating plant put in. The ores are free milling.

Occidental.—The strike of high-grade silver ore in this mine at White Hills, made 3 months ago, is said to continue as good as ever in size of ore body and richness.

Lucky Boy.—This mine has installed a gasoline steam pump and blower for the underground workings and increased the number of men at work. The main ore body, which is in a drift on the 300-ft. level, is said to average \$150 a ton by the car-load. T. B. Scott owns the mine.

Yuma County.

Goodenough.—This mine is near Tison Wells, about 25 miles east of Ehrenberg. The ore runs in silver and copper. The mine was worked as a silver proposition by a French company some years ago. About 15,000 ft. of development has been done to date. Chas. L. Eichelberger is one of the owners.

CALIFORNIA.

California State Miners' Association.—At the annual meeting of the San Francisco branch of this association last week, the following officers were chosen: President, Curtis H. Lindley; secretary, Charles G. Yale; treasurer, B. F. Lacy; executive committee: George H. Wallace, T. H. Mooser, George C. Sargeant; delegates to annual convention of the State Association: H. Neff, chairman; Thomas J. Barbour, E. A. Belcher, D. T. Cole, John Coleman, C. W. Cross, Tiley L. Ford, Curtis H. Lindley, Louis Glass, R. A. Grayson, E. E. Stoddard, T. Gottlieb, Joseph H. Mooser, C. H. Chase, F. A. Pierce, Thomas Price, S. C. Irving, A. J. Ralston, S. Mooney, John Rosenfeld, George Stowe, William Schaw, A. L. Taylor, Morris Falk, C. W. Kellogg, W. W. Montague, D. E. Hayes, M. H. Cook, John Birmingham, J. R. Folsom, H. T. Lally, E. A. Rix, W. A. Doble, Henry Taylor, Andrew Carrigan, George E. Dow, Philip Diersheimer, Willis G. Dodd, W. H. McCracken, J. F. Hough, L. C. Clark, A. W. Waller, George C. Sargeant, A. L. Scott, Julian Sonntag, J. F. Halloran, Charles G. Yale, S. J. Hendy, W. C. Ralston, J. O'Harron, L. N. Harris, George H. Wallace, B. T. Lacy.

Amador County.

(From Our Special Correspondent.)

Bellwether.—A small mill has been erected on this property, 1 mile north from Jackson.

Nome.—This mine, 7 miles from Sutter Creek, has been purchased by the Altaite Mining Company. The property, which prospects well, is to be developed.

Peerless.—The shaft is now down 500 ft., and sinking continues at this mine, 2½ miles south from Jackson. The prospects are said to be good.

El Dorado County.

(From Our Special Correspondent.)

O. S. Ford.—A small force of men are at work on this copper property, 3 miles southeast from Georgetown. Recently quite a large body of ore was cut in the supposed foot wall. The ore carries gold and silver.

Kern County.

(From Our Special Correspondent.)

Yellow Aster Mining Company.—This company has closed a contract with a San Francisco firm for a 100-stamp mill, to be erected at once.

Placer County.

(From Our Special Correspondent.)

Cash Rock.—At this drift mine near Forest Hill the management is prospecting the river with drillers, and claims to have encountered very rich gravel.

Eureka Consolidated.—The tunnel is now in 4,000 ft. in this drift mine, 3 miles north of Sunny South. The company owns about 6 miles of the Dick Channel. F. Chappellet, Jr., is superintendent.

Herman.—The 10-stamp mill at this mine, 6 miles north of Deadwood and 5 miles southeast from Westville, which was moved to the new site at the mouth of the tunnel, is running steadily. The property is opened up by several tunnels and cross-cuts. The tunnel connecting with the mill is 1,400 ft. long to one of the ledges, which is about 10 ft. wide and has been opened up for 140 ft. G. F. Stone is superintendent.

San Bernardino County.

(From Our Special Correspondent.)

Gold Mountain.—There are 75 men employed in the mine and mill on this property. The mill is run day and night, crushing about 140 tons every 24 hours. The ore is said to average \$5.50 per ton in gold. The mine is 5 miles northeast from Bear Lake. J. D. Spargo is superintendent.

Leoti.—Five tons of ore milled from this mine in the Dale District, yielded, it is said, about \$92 per ton in gold. The amount of ore on the dump is stated to be 800 tons. It is a cyanide proposition and the owners intend to erect a plant to treat the dump and the future output.

Shasta County.

(From Our Special Correspondent.)

William McDermott and W. B. Benham, of the Afterthought Mine, have filed a notice of a 3,000-in. water right of water from Little Cow Creek. The water will be used to generate power for mining and milling.

Copper King Group.—This property, which includes several adjoining claims near Copley, all having been developed under bond by J. Fillius for the past year is reported bonded to a Boston syndicate for \$130,000. A large body of rich copper ore is said to be in sight.

Gladstone.—This property, now owned by Roberts, McIntosh & Company, is being worked after remaining idle several years. The 20-stamp mill when repaired will start up. The property 5 miles northeast from French Gulch includes 9 mining claims.

Mountain Copper Company.—The strike at this company's mines at Keswick has been declared off by the miners, who have returned to work.

Sierra County.

(From Our Special Correspondent.)

York.—A shaft is being sunk in the upper tunnel of this mine, at the mouth of Snug Canyon. Cross-cutting from the lower tunnel will meet the line of this shaft. At 35 ft. in the shaft a rich ore body has been struck.

Trinity County.

(From Our Special Correspondent.)

Las Perlas.—The tunnel is now in 125 ft., and a cross-cut is said to show the ledge 30 ft. wide between well-defined walls, the main body being low grade. The high-grade streak is about 4 ft. wide, assaying over \$32 per ton in gold, while some bunches of very high grade are found near the foot wall. Extensive work is planned for the spring.

Last Chance.—This hydraulic mine is well equipped for the season's work on the Trinity River, 4 miles south of Junction City.

Tuolumne County.

App.—This property, worked by the Rawhide people, is increasing its mill from 20 to 60 stamps. The mine employs about 60 men, and is located in the town of Stent.

(From Our Special Correspondent.)

Blue Bird.—The tunnel at this mine, 1 mile west of the Buchanan Mine, about 11 miles from Sonora, is in 75 ft. and in the face of the tunnel there is 4 ft. of high-grade ore, besides 6 ft.

more of vein matter between the walls, all carrying gold.

Confidence.—A full force is now at work on this property 13 miles northeast from Sonora, with plenty of good ore in sight. The management expects a good run.

Crystalline.—Work at this mine, about 2 miles northwest from Quartz Mountain, is going on. The plant consists of a 30-H.-P. engine, an 80-H.-P. boiler and an air compressor, which is being moved to another part of the claim. The company intends to use oil for fuel.

Dutch.—At Quartz Mountain the 20 stamp mill is in operation, with 40 men busy.

Green Jumper Mining Company.—This company has purchased the buildings on the Excelsior and will remove them to its own mine, about 3½ miles above Sugar Pine, on the north fork of the Tuolumne River. Some very high-grade rock has been struck and the mine will probably develop into a valuable property.

Mount Vernon.—The new tunnel is now in 50 ft. and work is pushed. The prospects are very good. The old workings comprise several cross-cut tunnels driven in from the hanging wall. The property is 2½ miles northeast from Confidence.

COLORADO.

Clear Creek County.

(From Our Special Correspondent.)

Monarch Company.—Colorado Springs people have taken the group of claims controlled by this company, of which the Freeland is one and claim that machinery will be placed on Clear Creek and the tunnel continued ahead 1 mile to cut under the Freeland shaft. Fully 80 claims have been added to the group.

Stanley Consolidated Mining Company.—Manager Bell says that the proposed concentrating mill will not be erected until early next year. At 900 ft. drifts run to the south have opened the same class of mineral as was found in the upper workings. This is a lead and copper ore with gold and silver values and shows iron and zinc. Nearly all the drifts are in ore.

Sun & Moon Mining and Milling Company.—The shaft is down to 700 ft. and levels are being started. The streak of smelting ore is about 10 in. wide, with a much wider streak of concentrating ore. In the sixth level east the ore is running 6 oz. gold and 107 oz. silver. The values are in iron on the Minott Vein. Mr. J. W. Britton, of Cleveland, O., president, is inspecting the ore body and also examining the strike in the Newhouse Tunnel made over 1,000 ft. below the present mine workings. Mr. Britton has looked for tin in the Rockies for several years.

Gilpin County.

(From Our Special Correspondent.)

Ballard.—The past 10 months of development on the ore bodies of this gold producer on Breece Hill have made a large producing mine of what was only a claim a few years ago. At 422 ft., the lower level, drifts have been run to the limits of the claim in 4 directions and all are in ore. At 365 ft. they show 90 ft. of ore. Shipments are 40 tons daily. The shipments also include occasional shipments of bismuth ore to Europe. The bismuth streak is 5 ft. thick.

Catalpa-Crescent.—The shaft is down 500 ft., but work is at present carried on in the upper levels, from which 20 tons per day of good grade manganiferous iron is mined.

Bonanza.—This property is worked on the tributing system, and a good grade of milling and smelting ore is shipped. The smelting ore carries values largely in lead, with some zinc. F. A. Rank, Central City, is manager.

East Boston & Gilpin Gold Mining Company.—Daily shipments of milling ore are made, which give very fair results under stamps and a good streak of smelting ore has been opened up in the 300 east lot. The indications are that the company will sink on or about December 1st. T. J. Lott, Central City, is manager.

National.—A lift of 100 ft. has been completed and some very fair ore has been taken out in sinking which has been shipped to the mills. In the bottom of the shaft there is now a 10-in. streak of iron carrying values of \$60 per ton; another lift of 100 ft. will be sunk to make the shaft 600 ft. deep. Sherman Harris, Russell Gulch, is manager.

Rome-Gardner Gold Mining Company.—The lower or 800-ft. level is reported opening up well and milling and smelting ore is being taken out of the 6th and 7th levels. Some of the ore will be concentrated as a test at Idaho Springs. J. Bostwick, Central City, is manager.

Gunnison County.

Anthracite Coal Company.—This company recently incorporated under the laws of West Virginia by New York men with a capital of \$1,000,000, par value at \$10 per share. The officers are: W. E. Pedrick, president and treasurer; S. Halline, vice-president; R. L. Cerero, secretary. The directors are: W. E. Pedrick, Chas. C. Tegethoff, S. Halline, Wm. B. Skerton,

F. P. Hoffman. The company says that it controls over 6,000 acres of coalfields in this country, said to contain the most valuable deposits of anthracite west of Pennsylvania; also bituminous and coking coal in large quantities.

Lake County—Leadville.

(From Our Special Correspondent.)

Production.—The output the past week has averaged 2,500 tons per day of all classes of ore, the increased product being largely iron and zinciferous ores. The first of December will see several new producers on the list.

A. V.—This new shaft being put down by the Sheedy-Kountz syndicate is under way. The new plant of machinery is in place. This shaft is at the foot of Harrison avenue, a short distance from the Arkansas Valley Smelter downtown offices and goes after the extension of the Bohn and other ore shoots.

Castle View.—This Carbondale Hill property is steadily producing 35 tons per day of good iron ore. One stope has been driven 25 by 18 ft. into a body of iron ore, which averages 30% and in addition shows a streak of galena.

Highland Mining Company.—The new shaft on the old Highland Chief just west of the Ixex is down nearly 100 ft. and is to go down on the first contact, at least 400 ft.

Home Extension Company.—A new plant of machinery has arrived and is to be put in place. The shaft is down 400 ft.; it is in mineralized porphyry. The company has acquired title to considerable territory and has just secured a long lease from the city on the mineral under the streets and alleys within the territory acquired.

Josie.—Montana people have the new lease on this gold belt claim and are cutting stations at 400 ft., where the work of clearing out the old drifts which are badly caved will begin. A fine pumping plant is being put in.

Louisville.—After a long idleness this property on Iron Hill has resumed under the direction of Messrs. Arthur Nichols, formerly of the Maid, and J. H. Hughes. The water has been drained to the 650 ft. by pumping in adjoining mines and all work will be carried on above that level. The shaft is 1,000 ft. deep. Large iron bodies are exposed, from which shipments will be heavy. New development and prospecting will be carried on.

Modoc.—Extensive prospecting work is under way and the mine is shipping 30 tons daily of manganiferous iron.

Resurrection Gold Mining Company.—Shipments are heavy from No. 1 shaft. No. 2 shaft is 800 ft. deep, where stations have been completed and drifting for the main ore body is to start. The shaft is to continue downward. Immense ore bins and other accessories necessary for heavy shipments are completed.

Weldon Mining Company.—All damage by fire has been repaired, active work resumed in No. 2 shaft and shipments by rail will be steady after this week. The development work has opened up some wonderful ore bodies.

Mineral County.

Creede Shipments.—Ore shipments for the week ending November 10th were 108 cars, or 1,752 tons.

Alpha.—This Creede claim, owned by Motz & Peterson, is shipping several cars of ore monthly.

Bachelor.—This Creede mine is shipping 50 to 60 tons of silver ore daily.

Creede Quintet.—Coleman & Wheeler, who have a 3-years' lease on this group, have started a gang of men at work.

Commodore.—This Creede mine continues to increase its output. New electric machinery is in place and sinking below the tunnel is under way.

Saguache County.

Luis Land and Mining Company.—This company, which purchased Baca grant No. 4, is erecting a large mill near Crestone. Properties located on the grant and partially developed will furnish sufficient amount of ore to keep the mill operating. The company leases many of the mining claims of the grant.

San Juan County.

(From Our Special Correspondent.)

Galty Boy.—A cross-cut of 700 ft. is being driven by contractors, of which 100 ft. remain, but will be driven by December 1st.

Gladstone.—A cross-cut 450 ft. in length is being driven by Moyle Bros. to top this vein near Silverton, when shipments will be resumed.

Golden Horn.—This Silverton property is being examined by the Smuggler-Union people with a view of putting in a large force of miners and building a cyanide process.

Gold King Mining and Milling Company.—The mill is being connected with the American mine by a tramway, which is almost completed. No. 4 addition to the mill is completed, and machinery nearly all installed. These improvements will give the mill a capacity of 80 stamps.

Governor.—The Gold King Consolidated Mining Company has purchased this property from Henry Sherman and John Beal for \$1,700.

Jenny Parker.—A fair-sized streak of rich galena ore has been opened up in this property on Elk Creek, operated by D. Hogan. The owner some time ago refused \$10,000 for his claim.

Kendrick-Gelder Smelter. This new plant will shortly be blown in. The sampling department is already in operation and a large quantity of ore is in the bins.

Mazeppa Group.—A large vein of galena, with good gold and silver values, has been encountered in the 175-ft. tunnel.

Republican Group.—Negotiations are pending for a sale to an Eastern syndicate. Experts who have been conducting experiments say they are satisfied.

Robert Bonner.—C. L. Abbott, one of the owners, has taken a year's bond on this Silverton claim and will start men to work.

Silver Ledge.—A contract has been let to B. McIntyre et al. for driving a 300 ft. cross-cut.

Thunder-Keystone.—A 4-ft. vein of rich gray and yellow copper was recently opened in the main level. Arrangements are being made to put in a tramway.

Tin Cup.—Carver et al. have exposed a large vein of high-grade lead ore in this property, situated in Dry Gulch.

Washington.—The Quartz Mining and Milling Company has secured this Silverton property and has men at work, with Al. Kunkle as general manager.

Woods Investment Company.—This company has purchased 2 groups of claims worked all summer under bond on Bear Mountain. The price paid was \$16,000. Ed. Hollingsworth, John Rogers, F. J. Bawden and Moyle, Robbins, Anear and Klingler Brothers were the owners. The new owners will probably put in a large cyanide or chlorination mill.

Summit County.

Maximus.—This mine at Kokomo is shipping again. This property made regular shipments during the summer of high-grade gold and silver ore. Owing to the high altitude of the mine, 13,600 ft., it is a hard proposition to work. The lessees have to pay \$10 per ton to haul the ore. The vein is a fissure in granite. The pay streak is from 1 ft. to 18 in. wide, and runs high in gold and silver.

Teller County—Cripple Creek. (From Our Special Correspondent.)

Beacon Hill.—Ajax Gold Mining Company.—The control of this company is now in the hands of Messrs. Barbee and McDonald, and officers of the Mary McKinney Company. The property comprises 8 acres of patented ground on the south slope of Beacon Hill and is supposed to contain a continuation of the Mary McKinney vein. The new directors are W. S. Nichols, H. H. Barbee, T. P. Day, C. H. White and J. W. Graham. H. H. Barbee is vice-president and general manager.

Cameron Mines, Land and Tunnel Company.—A strike has been reported in a shaft 30 ft. deep on one of this company's numerous workings at Cameron. The strike is important, as it is outside of the present producing area.

Cripple Creek Columbia Mining Company.—Lessees Barbee and McDonald have purchased the control. A meeting has been called for December 17th, at which time it is understood the control will formally change hands. John Barbee has charge of the work on the Cripple Creek-Columbia, where there is a very good showing.

Elkton.—This mine started up on November 16th after its temporary close down to erect a new gallows-frame. The machinery is all in place, and the mine ready for large production. It is comparatively shallow considering the amount of ore that has been produced. The shaft will be sunk to 800 ft.

Fauntleroy Gold Mining Company.—A contract has been let for drifting on the vein recently cut in the Ophelia tunnel at 300 ft. from surface. The Williamson Brothers, leasing on the top 200 ft. of the Fauntleroy, are also shipping good ore. This company owns also the Mary D., 10 acres south of Victor, and part of the Garfield on Mineral Hill.

Moon Anchor Gold Mining Company.—This company has granted to H. G. Richards and associates a lease on the first and second levels of the mine within a radius of 50 ft. of the old Peachy shaft, through which the work will be carried on. A 30% royalty is required.

Moose Gold Mining Company.—The company has resumed work in the mine, and the shaft is now down 1,000 ft. Besides the Moose, the company owns the Ben Harrison, 8 acres, and the Trilby, 4 acres. The property is well equipped. There is also on the Trilby a shaft over 300 ft. deep.

St. Patrick Gold Mining Company.—A few months ago the St. Patrick claim was sold to Scotch and English capitalists. Since then work

on the property which lies in Victor has been actively prosecuted. The shaft is down 410 ft., and it is the intention of the company to sink to 600 ft. before starting levels.

Sunshine Gold Mining Company.—It is understood that a shipment of 2-oz. ore has been made from the Mattie Williams claim, situated on Galena Hill, outside of the recognized producing area.

GEORGIA.

White County.

White County Gold Mining Company.—This company has bought and is now operating the Thompson property. The shaft and other underground work are being pushed, and a 10-stamp mill is being put up. M. Blake, recently of Danlonega, is manager.

IDAHO.

Blaine County.

Red Cloud.—This mine at Hailey is reported to have produced \$100,000 in gold and silver this year.

Tipton.—This mine near Hailey has a shaft down 500 ft. and is said to show up nicely.

Custer County.

Lucky Boy.—A fall of rock in the shaft of this mine at Custer recently gutted the shaft and killed a station tender.

Idaho County.

Boston & Buffalo Idaho Consolidated Gold Mining Company.—A special meeting of the company will be held in Kittery, Me., December 3d. At this meeting it will be determined whether and in what manner the company will issue and negotiate 40 promissory 6% notes of \$1,000 each, payable January 1st, 1903, these notes to be secured by a mortgage of all the mines and property of the company.

Buffalo Hump District.—Clark & Sweeney are carrying on development on their claims and testing the ores in a 10-stamp mill. The claims are said to show some very good ore, but values are distributed irregularly. The Big Buffalo is best developed and about 40 men have been employed on it during this summer. The Vesuvius is not as well developed and about 20 men are employed. It is said to show a fairly large body of more even quality than that on the Big Buffalo. Besides the syndicate work there is some going on in other parts of the camp. At the Hump proper there are about 150 men. At Callender, the syndicate's town, there may be 180 residents, and at Concord, where the Boston & Buffalo-Idaho Company's claims are, there are about 25.

Little Giant.—On this mine near Warren there has been a large amount of development during the past year. Manager Hill has gone East but before leaving made all arrangements for development during the winter, to include prospecting new ground within the property as well as stopping in the several ore shoots now uncovered.

Mount Clemens & Idaho Company.—Jay A. Czizek, State mine inspector, is a large stockholder in these mines near Warren. Development is to continue all winter.

Silver King.—This property, in Warren, lately little heard of, has had very extensive development this year, and is reported showing up finely.

Jefferson County.

Elkhorn.—It is said that S. Gundaker has struck the lost vein in this famous old mine at Elkhorn, formerly worked by an English Company.

Shoshone County.

Morning Mining Company.—This company at Mullan is reported to have drifted from its No. 5 tunnel 2,000 ft. on a continuous ore which in places is 40 to 50 ft. wide. It is said to be the largest lead-silver body ever opened in the Coeur d'Alenes.

Owyhee County.

(From Our Special Correspondent.)

Poorman.—This property is equipped with a bucket tram 1 mile long, an excellent mill, and is 800 ft. deep. R. H. Britt is manager and F. A. W. Gerling superintendent. Men are drifting both ways on the vein from the bottom of the 350-ft. winze which connects with the long tunnel.

INDIANA.

Coal Miners' Strike.—More than 200 hoisting engineers and 7,000 miners in the State went out on November 13th as the result of the failure of the Indiana block and bituminous coal operators to sign the scale presented to them by the engineers. The operators were willing to pay the present scale until the convention of the United Mine Workers of America at Indianapolis in January, but the miners would not consent to this, though thus tacitly violating the agreement made last April.

MICHIGAN.

Copper—Houghton County.

(From Our Special Correspondent.)

Allouez.—A 6,000-lb. mass was recently found

in the lower levels of the new shaft on this property which is about 1,100 ft. deep.

Calumet & Hecla.—Articles of association showing the renewal of this corporation have been filed with the clerk of Houghton County. The present term expires April 13, 1901. The company was formed in 1871 by the union of the Calumet Mining Company, the Hecla Mining Company, the Portland Copper Company and the Scott Copper Company. The combined capital stock of these four companies at the time of union was \$1,200,000.

Centennial.—Work has stopped on the Osceola lode. The Kearsarge shaft is supplying about 220 tons of rock for the single stamp at the mill.

Old Colony.—This property is being developed in a systematic manner. On the northern part a shaft is down 65 ft. and 35-ft. drifts have been run to either side. The tunnel is in 1,400 ft. About 1,275 ft. from the mouth an amygdaloid lode was found and a shaft was sunk to 40 ft. from the bottom of the tunnel on the lode.

Osceola Consolidated.—A trestle is now under construction at the South Kearsarge location. It is to be 1,100 ft. long and will be used to tram the rock from No. 1 shaft to the rock house at No. 2.

Quincy.—It is stated that a new lode has been found on this company's property, but when questioned the officials stated that they have nothing to say regarding it.

Copper—Ontonagon County.

(From Our Special Correspondent.)

Mass Consolidated.—The crosscut from the 8th level has reached the Butler lode. This lode is characterized by heavy copper and stamp rock.

Globe.—This property will not be put on the market, as recently stated. It is controlled by John Stanton and lies about 10 miles south of Houghton, adjoining the Champion on the north and consists of 5 square miles of mineral land lying in a line east and west.

MISSOURI.

Jasper County.

(From Our Special Correspondent.)

Joplin Ore Market.—Lower grade ores have advanced from \$1.50 to \$2 per ton and 3 large sales were made last week at \$29 per ton by the King Jack on the land of the United Zinc Company, the Independence Mining Company, at Joplin, and the Three Friends Mining Company at Belleville. The Ajax and the Brookfield Mining Companies sold at \$28.50, an advance of 50c. per ton. The bulk of the Oronogo ore sold at \$28 per ton and the balance of the district ore according to quality. There has been no change in lead for the last 3 months and it brought \$23 per 1,000 lbs. Operators who produce ore assaying 60% and over refuse to accept less than \$30 for their ore and the greater part of the output of fancy-grade ore has remained in the bins for the past 3 weeks. Ore buyers succeeded in securing more cars last week than for some time and in consequence the zinc ore shipments were considerably larger than the previous week. None of the railroads entering Joplin are able to supply more than 50% of the cars needed for local traffic on account of the heavy shipments of grain.

Following is the turn-in by camps of the Joplin District for the week ending November 17th:

	Zinc lbs.	Lead lbs.	Value.
Joplin	2,265,710	433,500	\$40,558
Galena-Empire	1,258,860	123,630	17,949
Cartersville	1,504,310	330,620	25,556
Aurora	1,006,430	18,740	10,807
Belleville	345,540	.....	4,665
South Jackson	216,220	18,830	3,028
Webb City	481,930	56,080	7,073
Oronogo	660,630	.....	6,639
Cave Springs	180,840	12,690	2,643
Spring City	35,470	26,360	1,046
Central City	121,720	12,020	1,676
Granby	269,140	19,090	3,239
Spurgeon	150,660	50,760	2,521
Springfield	40,000	.....	560
Alba	218,370	.....	2,839
Carthage	185,410	.....	2,410
Stotts City	137,820	.....	1,964
Neck City	153,270	.....	2,069
Carl Junction	149,020	.....	1,925
Duenweg	100,230	10,340	1,390
Seneca	58,240	21,640	811
District total	9,539,820	1,134,890	\$142,119
Total 46 weeks.....	428,303,600	50,709,230	\$7,075,555

During the corresponding week last year top-grade zinc ore sold for \$32.50 per ton and lead for \$27 per 1,000 lbs. The lead sales were less than last week by 67,400 lbs., the zinc sales greater by 795,420 lbs., and the value greater by \$24,489. For the corresponding 46 weeks last year the lead sales were less by 8,283,142 lbs., the zinc sales greater by 21,115,410 lbs., and the value greater by \$2,672,206. As compared with the previous week, the lead sales were less by 24,130 lbs., the zinc sales greater by 860,560 lbs., and the value greater by \$9,558.

Anderson.—Shellenberger & Brenner, of De Kalb, Ill., who recently purchased this mine on the Granby land in Chitwood Hollow, west of Joplin, have a new 125-ton mill nearly completed. J. B. W. Amsden will erect a 100-ton mill at once at his new mine in Possum Hollow, just

west of the Joplin City limits. He has a very large face of high-grade zinc ore and has over 500 tons of very rich crush stuff on the dump.

Blakey, No. 2.—8-hi mine on the Granby land west of the city limits of Joplin was sold last week to Edgar Allen, of Quapaw, Ind. Ter., for \$6,000.

A 200-acre tract in the Joplin District was sold to Chicago parties for \$20,000. A company will be formed to develop it but the purchasers refuse to make public the names of the incorporators of the company.

John Dermott, of Webb City, has purchased of Mack Thacker his 40-acre tract at Carthage, adjoining the Pleasant Valley mines on the south. The consideration was \$4,000.

Hayseed.—These mines at Carthage were sold last week by the sheriff for \$5,700. A manager who knew nothing of mining was sent out from Boston and succeeded in running the company in debt to the extent of \$19,000. The company was trying to run the property after the manager was discharged, by long-distance telephone, but the sheriff interrupted proceedings.

Preston & Loy.—Gen. Green B. Raum, of Chicago, has purchased this 8-acre tract at Ash Grove in Green County for \$50,000. There are 21 shafts on the ground all in ore and a new custom mill has been contracted for by General Raum. The deal was made through Jas. P. Rice, of Joplin.

The Missouri & Kansas Zinc Miners' Association will incorporate next week with a large capital and will resume operations, which have been partially suspended for several months. It is said that an independent smelter is contemplated by the association and a fund will be provided to either purchase the ore of members or to enable the association to advance money to those who wish to hold their ore when the smelters refuse to pay a price based on the assay value fixed by the quotations of spelter in St. Louis.

Washington County.

American Lead and Baryta Company.—This company has been formed in Baltimore, Md., to acquire 33,100 acres of mineral land in this county, 65 miles southwest of St. Louis. It is said that the land contains deposits of barytes, lead, zinc and iron. The capitalization will be \$10,000,000 in stock and \$1,250,000 in 5% bonds. The Baltimore Trust and Guarantee is promoting the deal.

MONTANA.

Beaverhead County.

(From Our Special Correspondent.)

Bannary Dredges.—The electric dredge has closed for the season. The Graeter and Montana Dredges will run until freezing weather stops them off. The season has been satisfactory.

New Departure.—This property near Dillon, belonging to the Estate of L. A. Brown, is being operated by his son, A. B. Brown. This is one of the old producers of the State and is a straight silver proposition.

Polaris.—This property, situated 40 miles from Dillon at Polaris, has been sold, it is announced, to M. J. Donahoe and W. F. Snyder, of Salt Lake, for \$250,000. The vendor was Carlisle Mason, of Butte, who, with J. J. Cusic, secured the property some months ago under a bond for \$25,000; then John Macginnis, vice-president of the Montana Ore Purchasing Company and ex-Governor Rickards became interested in the bond and a force of miners was set at work blocking out ore. It is estimated that fully \$500,000 is blocked out ready for milling. The ore is principally silver and will be treated by the pan process. The sale is practically for cash, all the payments are due in 60 days. The purchasers are acting for a syndicate of capitalists of Salt Lake. It is the intention to erect at the mine a chloridization plant in the spring. The new owners take possession of the property on November 20th.

Granite County.

(From Our Special Correspondent.)

Manganese Ore.—Carl Werngren, of Helena, has contracted with the Illinois Steel Company to ship to Chicago 5,000 tons of manganese ore from Phillipsburg. Three cars per day is going forward and will continue until the contract is filled. The ore averages close to 50% Mn. and is low in phosphorus. If this proves satisfactory to the steel people the shipments are liable to continue indefinitely, as the deposit seems large.

Royal Gold.—This property is in the hands of leasers. The 20-stamp mill is running on ore from the Royal Claim; 12 men are employed.

Jefferson County.

(From Our Special Correspondent.)

Basin Gold and Copper Company.—The property of this company, which comprises the Hope Mine and Mill, has been attached by H. L. Frank, of Butte, for an indebtedness of \$45,261. The claim, according to papers filed at Boulder, is based on the failure of the company to repay Mr. Frank the sum of \$22,739, which he ad-

vanced, and the further sum of \$22,522, claimed to have been due to M. L. Hewett, of Basin, for money advanced by him and for services rendered for the company as manager for 21 months ending December 30th, 1899, said claim being assigned to H. L. Frank by Hewett. Several months ago the "Engineering and Mining Journal" found occasion to criticize the flotation of the stock of this company in the East. Subsequent events have shown the correctness of that criticism.

Basin & Bay State Mining Company.—The directors have petitioned the District Court for authority to mortgage the property for \$300,000 to enable them to pay off the indebtedness and complete the building of the smelter and concentrator at Basin. Glass Brothers, who have a heavy claim against the concern, are opposing the application for the mortgage on the ground that their interests would be placed in jeopardy. The property is in the hands of F. C. Berendes, of Boulder, as receiver.

West Rumley.—This property, near Comet, is under bond and lease to Norval Stewart & Company, who are making a shipment of 400 tons of ore to the Peck-Montana Concentrator at East Helena. This mine was worked quite extensively in the 80's, and has produced over \$400,000.

Lewis & Clarke County.

Montana Mining Company.—The total output for October was: Gold, 2,130 oz.; and silver, 17,890 oz., obtained from 1,211 tons of ore crushed in the mills, and from 11,750 tons of tailings from the dams. The estimated realizable value of the produce of the crushings is \$21,000, and of tailings \$32,700, a total of \$53,700. The treatment of 11,750 tons of tailings cost \$14,688. The total expenses were \$41,300, leaving a net estimated income of \$12,400.

Madison County.

A New York syndicate has had experts examining quartz deposits on Grasshopper Creek, with the result that rich mineral has been discovered. Many of these properties have been bonded, 26 being bonded in one group. Among them are the Excelsior, the Dakota, the Golden Leaf and the Blue Grass mines. It is believed by local men that in the near future a 100-stamp mill may be set up.

Bowery Mining Company.—This mine at Silver Star is successfully worked by the Glass Brothers, managers, and 10 additional stamps are being added to the 10 now in operation.

Silver Bow County.

Moulton Mining Company.—This company has been paying \$20,000 per year and has paid all told \$400,000. It is one of the few mining companies that pays dividends without producing any ore. The company owns a water system which supplies Walkerville and Centerville and a number of mines with water, and though the mine and mill have been idle for a number of years, the water system pays regular dividends.

(From Our Special Correspondent.)

Amy & Silversmith.—This silver property, just west of the Moulton, is being worked under a lease; the ore is sent for treatment to Tacoma.

Gem.—H. L. Frank, who is working this mine, north of the Speculator, will sink to the 1,000-ft. level and from the bottom run a long cross-cut to the north to explore adjacent property. J. C. Adams has charge.

Smokehouse.—At a depth of 400 ft. the shaft encounters about 12 in. of copper ore, which is supposed to be a stringer from the main ledge. Sinking will continue probably 200 ft. further.

Two Sisters.—This property, northwest of Walkerville, is shipping about 200 tons per month to the Tacoma smelter.

Washoe Copper Company.—Suit for \$700,000 damages has been instituted against this company by Joseph A. Boyer as executor of the estate of Alfred Boyer, for trespass in extracting ores from beneath the surface of Block 12, Leggett & Foster addition.

NEVADA.

White Pine County.

Jupiter.—This group, at White Pine, belonging to L. S. Scott and W. J. Peters, of White Pine, has been sold to a company in which Byron E. Shear and E. P. Giroux, of Denver, Colo., are interested. The property is said to show 2 ledges of ore carrying principal values in copper, with some gold. Active development is in progress.

NEW MEXICO.

Senate and Bobtail.—The Smithfield Company, which has been holding under bond and lease these mines near Elizabethtown has purchased the entire property of both mines, paying \$10,000 cash. By the purchase the company saves considerable on the bond and lease. The machinery includes a mill. Frank Spurr is manager.

Dona Ana County.

Torpedo.—The pipes and connections have arrived at the mine, and pumping out the south shaft has begun. The new pump is giving entire satisfaction.

Santa Fe County.

Cochiti Reduction & Improvement Company.—Rebuilding the mill at Woodbury, about 6 miles from Bland, is well under way. It is expected that the mill will be ready by January 1st. The iron machinery has been shipped from the Colorado Iron Works, of Denver, and the cyanide tanks, of a capacity to treat 50 tons of ore daily, from Los Angeles. A force of carpenters from Denver is now at work. The works will include the pneumatic cyanide process. The company is working the Iron King and the Good Hope claims at Bland. In addition to treating the company's ores, the mill will do custom work.

Juras-Trias Copper Company.—Charles R. Clapp, treasurer of this company, with headquarters in Toledo, O., in company with Wm. Jenks, general superintendent, recently went to Copper City to examine the copper properties and look after the development work which is being carried on.

NORTH CAROLINA.

Cabarrus County.

(From Our Special Correspondent.)

Phoenix.—This sold mine is being opened again. It was at this mine Capt. A. Thies adopted his well-known chlorination methods. The mine has been a paying producer.

Whitney Reduction Company.—This mine near Gold Hill has erected a 10-stamp mill and concentrating plant; also a chlorination works. They are in successful operation and report says the mine shows rich ore at present.

Davidson County.

(From Our Special Correspondent.)

Southern Mining and Developing Company.—This company is operating a mine near Thomasville. Wm. Brown is in charge.

Guilford County.

(From Our Special Correspondent.)

Deep River.—This old mine is being operated under the management of Dr. W. F. Harrell, who has associated with him Simonds & Wainwright, chemists, of New York City. Mr. Wainwright visited the property on November 8th and 9th. They have a copper-gold ore.

Rowan County.

(From Our Special Correspondent.)

Gold Hill.—These mines, belonging to the Gold Hill Copper Company, with offices in the Empire Building, New York City, are making more history. W. G. Newman, president of the company, it is said, ran the mines in debt some \$30,000 and they are now under attachment and in the hands of Capt. W. Murdock Wiley, the receiver, who advertises to sell on January 28th, 1901. It is reported that the entire debt is over \$36,000 and it is thought the property will bring every cent of this, as thousands of tons of low-grade copper ore are standing in the mine. The mines were attached some months ago and as no effort has been made to operate the receiver deems it wise to sell.

OREGON.

Baker County.

Golden Eagle.—This mine is in the Greenhorn District. The main drift is in 600 ft., with 5 ft. of ore in the face of the drift. A steam pump and other new machinery have recently been installed.

Lane County.

Independence.—Dr. A. C. Greenlee has taken a bond on the Independence Claim in Wind Creek District, from W. R. King, consideration \$10,000; and a bond on the Otter Tail from Dr. E. M. Anderson. These claims adjoin the Trailer and Aberdeen properties, owned by Dr. Greenlee.

Lucky Boy.—This mine at Blue River made a very good clean-up recently. Since the sawmill was put into operation over 160,000 ft. of mining timbers have been sawed. The 10-stamp mill is running steadily day and night. A new tunnel will soon start to take ore out nearly 100 ft. below the upper level, and this tunnel can be extended into the mountain a distance of 2,700 ft., getting a perpendicular depth of about 1,800 ft.

Roberts & Jilson.—This mine at Henley is said to have produced \$600,000 since it put in its 10-stamp mill 2½ years ago. There are 140 men engaged in mining in that neighborhood, and nearly 100 of these are engaged about this mine.

Sunset.—Blazier's little 2-stamp mill has begun operations since the rains set in and is steadily at work crushing ore from this mine near Blue River.

PENNSYLVANIA.

Anthracte Coal.

Forest.—The strike of the 700 employees of this mine at Archbald, which has continued since last March, has been satisfactorily settled by a committee of the miners in conference with representatives of the New York, Ontario & Western Company, which bought the mine from the former owners last week. The strikers get near-

ly all the concessions demanded, a decrease in the weight of loaded cars, a check weighman at head of the shaft, and an increase of \$1 on rock yardage, with allowances for removing water and gob. The mine will resume work as soon as it can be put in shape. It is the 4th largest producer in the Lackawanna Valley, and last year in 213 working days sent out 314,000 tons.

Natalie.—No. 4 slope, near Shamokin, is to be worked again after lying idle 5 years. The slope is about 2 miles east of the Natalie Colliery.

Bituminous Coal.

Possibly the most important of the recent deals in coal lands is that consummated by A. H. Levy, of Hamilton, Canada, who secured options on 60 tracts. He has filed a bond for the purchase money to be paid after the titles are approved.

The New York Central Railroad, confident of a boom about Altoona, is running a 30-mile line into the region from Hillsdale to Indiana, tapping a field of great richness. The Pennsylvania is running a new line through the Blacklick region. The Buffalo, Rochester & Pittsburg Railroad, a feeder for the New York Central, has arranged to open up hitherto undeveloped territory in the Dubois region. Nearly 100,000 acres in that field are to be opened within six months. The big operating company in this field is the Rochester & Pittsburg Company, a concern which has been active in large purchases within the last two weeks. The new holdings of this company alone, secured in 2 weeks, are estimated to comprise a little less than \$500,000.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Lightning Creek.—A. S. Rothermell has found a strong ledge of free milling gold ore near Lightning Creek, 11 miles west of Custer. A force of men is developing.

Vigilante.—The Eastern management has wired F. W. Bush, superintendent, to pump out the lower workings and resume sinking. The shaft is down 325 ft., following down a 4-ft. vertical of copper and gold ore. The shaft will be sunk 200 ft. deeper.

Lawrence County.

(From Our Special Correspondent.)

New Cyanide Plant.—A company has been organized to build a cyanide plant near Crook City, on Whitewood Creek, in which to treat a large bed of Homestake tailings. An order has been sent in for 10 60-ton cyanide tanks. J. M. Ellis and J. M. Guisinger, of Lead, are the principal promoters. Other parties are making plans to erect cyanide plants along Whitewood Creek in the spring.

Big Four Company.—A new strike of gold ore is reported in this mine, in Deadwood Gulch.

Galena District.—The Bullion Mine is working with 15 men and the Galena Mining Company is employing 30 men at the Alert and Hoodoo mines.

Hidden Fortune.—Otto Grantz shipped this week 4 car-loads of ore from this mine in the North Lead District to Denver. Grantz has announced that he intends to sell his mining properties, owing to his age. He has stated that 2 deals are now pending, one with London parties and the other with C. D. Woods, of Colorado Springs.

Homestake Company.—It is stated that the company will erect another cyanide plant on the north side of Lead Hill, providing the new 1,000-ton plant is successful. The second plant will be about 2/3 the capacity. There is also a prospect that the company will erect another stamp mill. The Caledonia stamp mill is nearly ready for work. Steam has been turned on at the pumping station and water has been turned into the new ditch. Work is rushed on the repairing of the De Smet Mill, at Central City.

North American Tin Company.—A. J. Johnston, of Spearfish, has promoted this company, which controls a group of 17 claims. Philadelphia and New York City men are interested in the company.

Pennsylvania Company.—N. H. Shenck has sold to this company 9 claims; consideration, \$39,000. The company has started work and opened a rich vertical of gold ore. The location is at the mouth of Rutabaga Gulch, 5 miles west of Deadwood.

Shawmut Mining Company.—This company has started up its new 50-ton cyanide plant in Blacktail Gulch. The ore is a cement and is first run through a Huntington 30-ton mill. Edison Dewey, of Boston, is president.

Wasp No. 2.—The new cyanide plant, in Yellow Creek District, is running steadily on 50 tons per day, with a high extraction.

Pennington County.

(From Our Special Correspondent.)

Big Bend Company.—Work has been suspended at the Big Bend placer on Rapid River, owing to cold weather. Messrs. Roesler & Johnson have returned to New York City. The company's plant has worked since last May.

TEXAS.

El Paso County.

It is stated that Phelps, Dodge & Company, who now control copper mines at Nacosari, Sonora, just south of the Arizona line, and at Bisbee, Globe and Morenci, Arizona, are building from the junction of their Nacosari Bisbee mines to Lordsburg, N. M., where they will form a junction with their road from Morenci and connect, via a short link of the Southern Pacific, at Lordsburg, N. M., from where the company's line will build direct into El Paso. The smelting of ores will be discontinued at the mines and all the smelting ores and concentrates shipped to El Paso for treatment there where a large copper smelter will be built. The only ores treated at the mines will be low grade, which will be treated through leaching and concentrating. The company will also erect a converter at El Paso in which the matte from the smelter and leachers will be refined. It is said further that the company will buy ores in open market for its El Paso plant.

UTAH.

Piute County.

(From Our Special Correspondent.)

Annie Laurie.—In lower tunnel, 1,100 ft. from the mouth, the vein is cut, showing as good average values as above. Messrs. P. L. Kimberley and L. C. Huck visited the mine just after election. The mill will be in commission by the end of the year.

Aurora.—It is said exploration will continue all winter on the Aurora, which adjoins the Wedge. Where the vein is just cut it shows \$10.60 gold and 6 oz. silver across the face.

Bully Boy & Webster.—A shipment of concentrates was settled for recently which returned 42% lead, 35½ oz. silver, \$4.80 gold per ton. A sample lot of crude rock returned 18% lead, 16 oz. silver, \$1.40 gold. Manager Packard says he is pleased.

WASHINGTON.

Ferry County.

(From Our Special Correspondent.)

Republic Consolidated.—The mill is running about to its full capacity. After the ore is mined it is sent to the sampling mill in a car and dumped into a bin. From the bin it is drawn into cars and fed into a large crusher at the rate of 25 tons an hour. After crushing it is elevated to a revolving screen. All the ore that does not pass through it is deposited in a hopper, passes under rolls and is again screened. When of the desired size it is elevated to a receiving bin. When wanted it is drawn into a skip and elevated to the top of the mill, 400 ft. distant, by an aerial tram. Here it is deposited in another bin and drawn from this into revolving driers. It is then conveyed to rolls, ground still finer and fed to ball mills, where it is ground to a 60-mesh. The ore is carried to the roasting oven and moved by revolving shovels on endless chains. At the discharge end the red hot ore is elevated to a movable table on top of the oven and conveyed to an endless belt, which delivers the finished ore to a bin.

The ore from the time it is placed in the oven until it is discharged requires about 8 hours. From the bin it is drawn into cars and transported by rail to the cyanide tanks, where it is treated to from 6 to 8 days. Powdered zinc is used to precipitate the gold and silver held in solution. The precipitate is passed into a press and the liquid squeezed out, then treated to an acid bath, after which it is smelted and run into bars. The crushers and driers are handling 150 tons daily. The first bullion was expected by November 15th.

WYOMING.

Carbon County.

(From Our Special Correspondent.)

Beaver Creek District.—This section of the copper belt has come into prominence more rapidly this season than probably any other section. Outside of the Butte District, it will doubtless be the next to ship any considerable amount of high-grade ore. It is located about 10 miles southeast of Encampment and some 7 or 8 miles west of Collins on the direct road from Encampment to North Park, Colo. Among the most notable groups of claims is that owned by Messrs. Webber, Daniels & Holmes, upon which much work has been done, mainly by tunnel. Much of the ore is high grade. The Newsboy Group is owned by C. Henry and associates and has a large body of low-grade ore. The Evening Star Mine, owned by Bills and others, has a large vein a considerable portion of which runs high in copper. A carload has been shipped to a Denver smelter. A portion of this vein shows little copper, but yields well in gold. The well-known Woodson Brothers group of 14 claims near the Evening Star and Aetna have recently been stocked for \$1,000,000 under the name of the Bay Horse Copper Mining Company. Assays at 35 ft. in depth on the Bay Horse claim give good copper values and some gold.

Encampment District.—The section tributary to the town of Encampment and lying south-

east to and southwest of it, has made decided progress this year, due to the large amount of development, stimulated by the completion of a well-arranged concentrating plant at the Kurtz-Chatterton group on Copper Creek and the beginning of a large smelter adjoining the town site.

Creede.—The Creede, fraction and other claims southeast of the Michigan Girl and on the same vein have passed into the hands of the Creede Copper Mining Company. An unusually large shaft house has been erected on the Creede, and work will go on all winter.

Crescent Mining Company.—This company owns claims a short distance down the gulch from the Kurtz-Chatterton Mill, which were located by Mr. Avery, of Encampment, and are owned by him, Mr. Ryder, and others, of Chicago. The company has houses erected and is driving a tunnel into the Kurtz-Chatterton hill by hand drilling.

Gertrude.—This claim near Battle has erected a fine shaft-house.

FOREIGN MINING NEWS.

ASIA.

India—Mysore.

The output of the Colar Gold-field for October is reported at 41,834 oz. crude, being 884 oz. less than in September, but 2,039 oz. more than in October, 1899. For the 10 months ending October 31st the total was 409,831 oz. crude, against 364,412 oz. in 1899, showing an increase of 45,419 oz., or 12.5%. The total this year was equal to 368,848 oz. fine gold, or \$7,624,088.

CANADA.

British Columbia—Boundary District.

(From Our Special Correspondent.)

Mother Lode.—Last March the British Columbia Copper Company, of New York, decided to add to the machinery already in use at its Mother Lode Mine. A cross compound Corliss condensing Ingersoll-Sergeant air compressor, with receiver intercooler. The high and low-pressure steam cylinders are to be 22-in. and 40-in. diameter respectively, the air cylinders of the piston inlet type, 19¼-in. and 32¼-in. respectively and 48-in. stroke, the machine to have a capacity of 30 to 40 drills. The company also ordered two 66 by 16 horizontal return tubular boilers, each 100 H. P. for 125 lbs. working pressure; a 54-in. by 12-ft. air receiver; a feed-water heater for 350-H.-P. boilers; 10 E 24 drills; 2 double-screw and 10 single-screw columns with arm and clamp; 2 iron safety platform cages, with safety device and shield roof; 2 6-ft. sheave wheels; 1,500 ft. of 1¼-in. wire rope, and 6 steel ore cars, with McCaskell wheels and axles. The greater part of this plant has now been received and some of it installed. The compressor will be ready in about 6 weeks. A large hoisting engine, ordered in June, is due to arrive this month. Ore shipments to the company's smelter began recently and more than 1,000 tons are now in the smelter ore bins. The ore is turning out well, bulk values being satisfactory, and development work at both 200 and 300-ft. levels showing plenty of ore available.

British Columbia—Vancouver Island.

Van Anda Mining Company.—According to press dispatches Harry W. Treat, who owns a proprietary interest in the stock of the Van Anda Mining Company, has bonded that copper property, comprising a mine and smelter, to New York and Chicago men for a large sum, stated to be as much as \$750,000.

British Columbia—West Kootenay District.

(From Our Special Correspondent.)

Rosland Ore Shipments.—The shipments of ore from Rosland mines for 10½ months ending November 15th amounted to 186,000 tons, valued at \$2,976,000 gross.

Bonanza.—According to the superintendent, S. W. Hall, the tunnel is in 67 ft. and has followed the ledge all the way. The walls are well defined with deorite on the hanging and porphyry on the foot. The pay streak is 3 ft. wide at the bottom and 18 in. at the top. The ore is a mixture of sulphides.

Rosland Chamber of Mines.—An association of mining men with this title has just been formed. J. B. McArthur and W. J. Whitesides have been respectively elected president and secretary pro tem.

West Kootenay Power and Light Company.—The management is about to increase its capacity by the addition of 10,000 H. P. It is proposed to sell the power at a lower rate than formerly.

Ontario—Lake of the Woods District.

(From Our Special Correspondent.)

Exploration Party No. 10, in charge of John McAree, of Rat Portage, one of the parties sent out last summer to explore Northern Ontario, returned to Rat Portage on November 12th. It

saw nothing but Lorientian rocks, excepting one or two narrow bands of Huronian.

There is high water now on all the lakes and streams of the Rainy River District, owing to the heavy rains in September and October. Navigation closing, many of the smaller craft being already laid up.

Ontario—Sudbury District.
(From Our Special Correspondent.)

The Mond Company is erecting a costly plant at Victoria Station, about midway between Whitefish and Worthington, on the "Soo" branch of the Canadian Pacific. The Mond Company's ores will all be smelted there, those from its Denison Mines being carried on an elevated wire rope tramway 2½ miles, and the ores from the Levack Mines brought over the Canadian Pacific a distance of over 50 miles.

COAL TRADE REVIEW.

New York. Nov. 23.
Anthracite.

There is such a brisk demand for anthracite from all consuming territories that the pressure on dealers is actually greater now than it was during the strike. Sales-agents and jobbers at both Eastern and Western points are overwhelmed with orders for immediate delivery and have much trouble making insistent purchasers understand why immediate delivery is impossible. Buyers fail to understand why cars should be in short supply unless they have strayed to soft-coal mines, and this supposition the soft-coal men contradict. As a matter of fact, cars are in short supply, there is a shortage of water at collieries in certain districts, and most of the floating labor at the mines drifted away during the strike. On top of these causes of diminished production the miners themselves are not working as efficiently as before the strike. The prospects are that it will take a few weeks yet to get things back to normal.

In the West, both in Chicago territory and at the head of the lakes, retail buying did not respond to the cold wave as was expected. Evidently many householders have stocked up pretty well or will burn soft coal this winter. The supplies on docks at Duluth are still scanty. Fair amounts are going up the lakes from Buffalo, but the movement is kept down by the heavy demand for immediate delivery from all inland points. In Chicago territory, likewise, stocks on docks are light and increase slowly. Lake receipts at Milwaukee are said to be nearly 300,000 tons less than to corresponding date last year. All-rail receipts at Chicago are light.

In the East jobbers and sales-agents find much trouble in satisfying demands for coal; in fact, are often unable. The retail trade responded quickly to cold weather. There is a lot of coal wanted east of Cape Cod and but little going forward. Buyers at Boston who talked of getting coal at their own terms when the strike should be declared off now talk differently. At New York retailers have advanced prices 50c. Wholesale prices are naturally firm, with little prospect of weakening for some time. We know of one cargo of a special size that sold at New York this week for 25c. above list prices.

Regular quotations for free burning white ash, f. o. b. New York Harbor port are: Broken, \$4; egg, \$4.25; nut and stove, \$4.50; pea, \$3; buckwheat, \$2.50.

Bituminous.

The pressure for coal in the Atlantic seaboard soft coal trade has increased during the past week, owing to the small amounts received by consumers. This limited supply is due chiefly to the very limited car supply at the mines. All classes of coal are affected more or less. Producers have sometimes been unable to get 50% of the cars they wanted during the week and but seldom 70%. The average car supply at the collieries has been about 60%. There is as yet no actual shortage of coal for early delivery, but unless the main-line roads provide more cars soon consumers may be pinched.

The far East is calling for considerable coal on old contracts, but there is no very heavy pressure for it, though fair amounts are going forward. Deliveries are limited not only by car supply, but by adverse weather interfering with the movements of coastwise craft. Along Long Island Sound there is a heavy demand for coal. Consumers there were getting all the lower grades they wanted and a fair tonnage of better grades when the sudden shortening of a car supply cut down shipments from the mines. New York Harbor trade is quiet. The outlying territory about New York is trying its best to stock up, but finds difficulty in doing this. All-rail trade is taking a fair amount of coal—all the better grades it can get and a fair proportion of the lower grades. Foreign trade shows a falling off in demand, though cargoes are going abroad steadily.

Transportation from mines to tide-water is irregular. Car supply at the collieries causes much complaint. Most producers get 40% less than the whole number of cars wanted. In the coast vessel market, vessels are very scarce, due to bad weather and adverse winds along

shore. We quote current rates for large vessels from Philadelphia as follows: Providence, New Bedford and the Sound, 65c.; Boston, Salem and Portland, 75c.; Wareham and Portsmouth, 80c.; Lynn, 85c.; Newburyport and Bath, 95c. @ \$1; Bangor, \$1.05 @ \$1.10; Gardiner, \$1 @ \$1.10 and towages; Saco, \$1.10 and towages.

Birmingham, Ala. Nov. 19.
(From Our Special Correspondent.)

The coal production is greater than ever, but there is demand for every ton mined. State Mine Inspector J. deB. Hooper, in his report reiterates his estimate of 8,500,000 tons. Last year the production was 7,484,778 tons. Labor troubles do not worry the district.

The Mississippi River barge line trade continues exceedingly active with no indications of a let-up in the next 5 or 6 months. Two boats are now working the barge line, besides the little tug boat which is working around the starting point, Greenville, Miss. The Southern Railway is behind the barge line and is guaranteeing delivery of the coal. Representatives of large dealers and consumers in Louisiana have been at Birmingham investigating as to coal production. Alabama coal is still proving satisfactory in Louisiana.

Chicago. Nov. 20.
(From Our Special Correspondent.)

Anthracite Coal.—The fact that there exists a scarcity of anthracite coal in this city is the main reason that prices have been maintained. The situation is favorable for the continuation of present prices all winter, while assertions are freely made that hard coal will go higher. The demand from all sources for the week was rather larger than the preceding week. Lots of the small dealers from out of town are practically out of hard coal and are fairly begging the shippers for further supplies, but are getting little. Prices are firm at \$6 for all sizes.

Bituminous coal has not been in much demand, many of the larger concerns having already placed their contracts, and the week's business has been mostly in small lots for those who buy about enough for actual wants. The main increase in the soft coal line has been in coal coming from West Virginia and Kentucky for domestic purposes. This line of coal has been very much in demand because of the high price on anthracite.

Cleveland, O. Nov. 21.
(From Our Special Correspondent.)

Between the scarcity of coal cars and the delays to the lake boats by the severe storms and dense fogs the coal shippers are in despair of being able to get much more of their product up the lakes this year than has already been sent. Last week the rates were about 25c. to all ports. The vessel owners have come into absolute possession of the market. To-day the rates from all south shore points to all upper lake ports have been fixed at 50c. and even at that the owners are not able to fill all of the demands that are made of them for tonnage. Coal cars also are getting scarcer and scarcer and whereas the railroads were able a short time ago to fill 80% of their orders for empties, the shippers are satisfied now with about 60%. The soft coal movement appears to be very light, but the shippers are not worrying much because they have exceeded in shipment the amount they hoped to have on the upper lake stock piles at the end of the year. The anthracite shipment is heavier and consequently Erie and Buffalo are drawing heavily on Cleveland's supply of tonnage. The sales of coal are now mostly for domestic purposes and the prices are unchanged.

Pittsburg. Nov. 21.
(From Our Special Correspondent.)

Coal.—The only change in the coal situation is the prospect of a rise in the rivers to-morrow, which will let on a lot of the coal tied up in the harbor. There are fully 30,000 bus. of coal loaded and ready to go to the Southern markets and the rains of the past few days have swelled the rivers and it is believed that fully 10,000,000 bus. can be sent out. There is a shortage of coal in the lower markets and it is possible that prices may advance. The Monongahela River Consolidated Coal and Coke Company, the river coal combination, has not made any announcement of an advance and it is probable that there will be no change. At the convention of the miners of the Irwin field last Saturday it was decided to leave the question of rate for mining coal for Eastern shipment to the national convention of the United Mine Workers, which will be held in January. The Pittsburg Coal Company, the railroad combination, is still behind in its deliveries. It will fill all its contracts for the Northwestern trade, the officials claim, and they will exceed last year by fully 500,000 tons.

Connellsville Coke.—There was an unexplainable falling off in the production last week of over 10,000 tons. Prices remain the same as last week—\$2 for furnace and \$2.25 @ \$2.50 for foundry. The outside producers are selling furnace at \$1.50 and foundry at \$1.75 @ \$2. Of the 20,960 ovens in the region, 14,926 are active and 6,034 are idle. The production last week was 143,573 tons, a decrease of 10,165 tons compared with the produc-

tion of the previous week. The shipments for the week aggregated 7,523 cars, distributed as follows: To Pittsburg and river tipples, 2,654 cars; to points west of Pittsburg, 3,237 cars; to points east of Connellsville, 1,632 cars. This is an increase of 288 cars.

Shanghai, China. Oct. 17.
(Special Report of Wheelock & Co.)

Coal.—Japan coal is unchanged; Welsh-Cardiff is weak, and Sydney Wollongong shows a moderate demand. Arrivals of all kinds of coal during the fortnight were 15,162 tons. We quote per ton: Welsh Cardiff, 27 @ 28 taels (\$17.98 @ \$18.65); Australian Wollongong, cargo, ex-go-down, 13 taels (\$8.66); and other sorts, 7.50 @ 8.50 taels (\$4.99 @ \$5.96); Chinese, Kaiping lump, 7.50 @ 10 taels (\$4.99 @ \$6.67); dust, 5 taels (\$3.33), and mixed, 5.50 @ 6 taels (\$3.66 @ \$4); Japan, all contracted for.

Kerosene Oil.—Very little has been done, and the market is very weak, principally due to tight money, two native banks having failed with large liabilities. Stocks are estimated at 1,005,000 cases American; 304,650 cases Russian, and 10,870 cases Sumatra; total, 1,320,520 cases. Quotations per cases are as follows: American Devoo's, 2 taels (\$1.34); Russian Batum Anchor Chop, 1.95 tael (\$1.30); Star & Crescent and Ram Chop, 1.91½ taels (\$1.28); bulk oil, in 2 tins, 1.81½ taels (\$1.22); Sumatra Langkat, bulk in 2 tins, 1.81½ taels (\$1.22).

Foreign Coal Markets.

Messrs. Hull, Blyth & Company, of London and Cardiff, report under date of November 10th that the coal market is weak, with little demand. Prices are: Best Welsh steam coal, \$4.80 @ \$5.16; seconds, \$4.68 @ \$4.80; thirds, \$4.32; dry coals, \$4.68; best Monmouthshire semi-bituminous, \$4.44 @ \$4.56; seconds, \$4.32; best small steam coal, \$2.40 @ \$2.46; seconds, \$2.16 @ \$2.28; other sorts, \$1.74.

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.

In freights from Welsh ports a rather steadier tone is manifest, especially to Mediterranean points. The rate from Cardiff to Marseilles is quoted at \$2.20; Genoa or Naples, \$2.34; Las Palmas, \$1.98; St. Vincent, \$2.16; St. Lucia, \$2.28; Buenos Aires, \$3.12; Rio Janeiro, \$3.48.

There is nothing new in the French trade; the strike in the Pas-de-Calais is still unsettled.

In Germany there is a strong feeling manifest against the coal syndicates, but it is doubtful whether this results in anything more than talk.

There is nothing new here with regard to export business. Inquiries continue to come in frequently, but no new contracts are reported. Freight to European ports are unchanged.

A charter from Philadelphia to Port Elizabeth, South Africa, is noted this week at 26s. (\$6.24) sailing in December. We also learn that a charter was booked abroad from Cardiff to Vera Cruz at 11s. (\$2.64), which is 1s. 6d. (36c.) less than was recently taken.

SLATE TRADE REVIEW.

New York. Nov. 23.

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. ville.	Bangor.	Bangor Ribbon.	Alb'n. of Jackson Bangor.	Chap'n Keys ne	Peach Bottom.	Sen Gr'n.	Unf'd Green.	Red.
24 x 14	6.50	3.50	3.00	3.00	5.10	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	.....	5.25	2.90	3.75	.....
22 x 11	6.50	3.75	3.25	3.00	4.00	5.25	2.90	4.00	.....
20 x 12	6.90	3.75	.....	3.00	.....	5.25	2.90	3.75	.....
20 x 11	6.80	.....	.....	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	.....	3.25	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	6.60	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	6.60	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	4.25	10.50
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

Another week of quiet, and demoralized prices by excessive competition. In the first half of this month the shipments from Slatington and Walnutport, Pa., were 14,740 squares roofing slate; 333 cases school slates and 1,340 crates blackboards.

The exports of slate from New York in October were valued at \$31,102, making a total for the 10 months this year of \$357,199, showing a

ly all the concessions demanded, a decrease in the weight of loaded cars, a check weighman at head of the shaft, and an increase of \$1 on rock yardage, with allowances for removing water and gob. The mine will resume work as soon as it can be put in shape. It is the 4th largest producer in the Lackawanna Valley, and last year in 213 working days sent out 314,000 tons.

Natalie.—No. 4 slope, near Shamokin, is to be worked again after lying idle 5 years. The slope is about 2 miles east of the Natalie Colliery.

Bituminous Coal.

Possibly the most important of the recent deals in coal lands is that consummated by A. H. Levy, of Hamilton, Canada, who secured options on 60 tracts. He has filed a bond for the purchase money to be paid after the titles are approved.

The New York Central Railroad, confident of a boom about Altoona, is running a 30-mile line into the region from Hillsdale to Indiana, tapping a field of great richness. The Pennsylvania is running a new line through the Blacklick region. The Buffalo, Rochester & Pittsburg Railroad, a feeder for the New York Central, has arranged to open up hitherto undeveloped territory in the Dubois region. Nearly 100,000 acres in that field are to be opened within six months. The big operating company in this field is the Rochester & Pittsburg Company, a concern which has been active in large purchases within the last two weeks. The new holdings of this company alone, secured in 2 weeks, are estimated to comprise a little less than \$500,000.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Lightning Creek.—A. S. Rothermell has found a strong ledge of free milling gold ore near Lightning Creek, 11 miles west of Custer. A force of men is developing.

Vigilante.—The Eastern management has wired F. W. Bush, superintendent, to pump out the lower workings and resume sinking. The shaft is down 325 ft., following down a 4-ft. vertical of copper and gold ore. The shaft will be sunk 200 ft. deeper.

Lawrence County.

(From Our Special Correspondent.)

New Cyanide Plant.—A company has been organized to build a cyanide plant near Crook City, on Whitewood Creek, in which to treat a large bed of Homestake tailings. An order has been sent in for 10 60-ton cyanide tanks. J. M. Ellis and J. M. Guisinger, of Lead, are the principal promoters. Other parties are making plans to erect cyanide plants along Whitewood Creek in the spring.

Big Four Company.—A new strike of gold ore is reported in this mine, in Deadwood Gulch.

Galena District.—The Bullion Mine is working with 15 men and the Galena Mining Company is employing 30 men at the Alert and Hoodoo mines.

Hidden Fortune.—Otto Grantz shipped this week 4 car-loads of ore from this mine in the North Lead District to Denver. Grantz has announced that he intends to sell his mining properties, owing to his age. He has stated that 2 deals are now pending, one with London parties and the other with C. D. Woods, of Colorado Springs.

Homestake Company.—It is stated that the company will erect another cyanide plant on the north side of Lead Hill, providing the new 1,000-ton plant is successful. The second plant will be about 2/3 the capacity. There is also a prospect that the company will erect another stamp mill. The Caledonia stamp mill is nearly ready for work. Steam has been turned on at the pumping station and water has been turned into the new ditch. Work is rushed on the repairing of the De Smet Mill, at Central City.

North American Tin Company.—A. J. Johnston, of Spearfish, has promoted this company, which controls a group of 17 claims. Philadelphia and New York City men are interested in the company.

Pennsylvania Company.—N. H. Shenck has sold to this company 9 claims; consideration, \$39,000. The company has started work and opened a rich vertical of gold ore. The location is at the mouth of Rutabaga Gulch, 5 miles west of Deadwood.

Shawmut Mining Company.—This company has started up its new 50-ton cyanide plant in Blacktail Gulch. The ore is a cement and its first run through a Huntington 30-ton mill. Edison Dewey, of Boston, is president.

Wasp No. 2.—The new cyanide plant, in Yellow Creek District, is running steadily on 50 tons per day, with a high extraction.

Pennington County.

(From Our Special Correspondent.)

Big Bend Company.—Work has been suspended at the Big Bend placer on Rapid River, owing to cold weather. Messrs. Roessler & Johnson have returned to New York City. The company's plant has worked since last May.

TEXAS.

El Paso County.

It is stated that Phelps, Dodge & Company, who now control copper mines at Nacosari, Sonora, just south of the Arizona line, and at Bisbee, Globe and Morenci, Arizona, are building from the junction of their Nacosari Bisbee mines to Lordsburg, N. M., where they will form a junction with their road from Morenci and connect, via a short link of the Southern Pacific, at Lordsburg, N. M., from where the company's line will build direct into El Paso. The smelting of ores will be discontinued at the mines and all the smelting ores and concentrates shipped to El Paso for treatment there where a large copper smelter will be built. The only ores treated at the mines will be low grade, which will be treated through leaching and concentrating. The company will also erect a converter at El Paso in which the matte from the smelter and leachers will be refined. It is said further that the company will buy ores in open market for its El Paso plant.

UTAH.

Plute County.

(From Our Special Correspondent.)

Annie Laurie.—In lower tunnel, 1,100 ft. from the mouth, the vein is cut, showing as good average values as above. Messrs. P. L. Kimberley and L. C. Huck visited the mine just after election. The mill will be in commission by the end of the year.

Aurora.—It is said exploration will continue all winter on the Aurora, which adjoins the Wedge. Where the vein is just cut it shows \$10.60 gold and 6 oz. silver across the face.

Bully Boy & Webster.—A shipment of concentrates was settled for recently which returned 42% lead, 35½ oz. silver, \$4.80 gold per ton. A sample lot of crude rock returned 18% lead, 16 oz. silver, \$1.40 gold. Manager Packard says he is pleased.

WASHINGTON.

Ferry County.

(From Our Special Correspondent.)

Republic Consolidated.—The mill is running about to its full capacity. After the ore is mined it is sent to the sampling mill in a car and dumped into a bin. From the bin it is drawn into cars and fed into a large crusher at the rate of 25 tons an hour. After crushing it is elevated to a revolving screen. All the ore that does not pass through it is deposited in a hopper, passes under rolls and is again screened. When of the desired size it is elevated to a receiving bin. When wanted it is drawn into a skip and elevated to the top of the mill, 400 ft. distant, by an aerial tram. Here it is deposited in another bin and drawn from this into revolving driers. It is then conveyed to rolls, ground still finer and fed to ball mills, where it is ground to a 60-mesh. The ore is carried to the roasting oven and moved by revolving shovels on endless chains. At the discharge end the red hot ore is elevated to a movable table on top of the oven and conveyed to an endless belt, which delivers the finished ore to a bin.

The ore from the time it is placed in the oven until it is discharged requires about 8 hours. From the bin it is drawn into cars and transported by rail to the cyanide tanks, where it is treated to from 6 to 8 days. Powdered zinc is used to precipitate the gold and silver held in solution. The precipitate is passed into a press and the liquid squeezed out, then treated to an acid bath, after which it is smelted and run into bars. The crushers and driers are handling 150 tons daily. The first bullion was expected by November 15th.

WYOMING.

Carbon County.

(From Our Special Correspondent.)

Beaver Creek District.—This section of the copper belt has come into prominence more rapidly this season than probably any other section. Outside of the Butte District, it will doubtless be the next to ship any considerable amount of high-grade ore. It is located about 10 miles southeast of Encampment and some 7 or 8 miles west of Collins on the direct road from Encampment to North Park, Colo. Among the most notable groups of claims is that owned by Messrs. Webber, Daniels & Holmes, upon which much work has been done, mainly by tunnel. Much of the ore is high grade. The Newsboy Group is owned by C. Henry and associates and has a large body of low-grade ore. The Evening Star Mine, owned by Bills and others, has a large vein a considerable portion of which runs high in copper. A carload has been shipped to a Denver smelter. A portion of this vein shows little copper, but yields well in gold. The well-known Woodson Brothers group of 14 claims near the Evening Star and Aetna have recently been stocked for \$1,000,000 under the name of the Bay Horse Copper Mining Company. Assays at 35 ft. in depth on the Bay Horse claim give good copper values and some gold.

Encampment District.—The section tributary to the town of Encampment and lying south-

east to and southwest of it, has made decided progress this year, due to the large amount of development, stimulated by the completion of a well-arranged concentrating plant at the Kurtz-Chatterton group on Copper Creek and the beginning of a large smelter adjoining the town site.

Creede.—The Creede, Fraction and other claims southeast of the Michigan Girl and on the same vein have passed into the hands of the Creede Copper Mining Company. An unusually large shaft house has been erected on the Creede, and work will go on all winter.

Crescent Mining Company.—This company owns claims a short distance down the gulch from the Kurtz-Chatterton Mill, which were located by Mr. Avery, of Encampment, and are owned by him, Mr. Ryder, and others, of Chicago. The company has houses erected and is driving a tunnel into the Kurtz-Chatterton hill by hand drilling.

Gertrude.—This claim near Battle has erected a fine shaft-house.

FOREIGN MINING NEWS.

ASIA.

India—Mysore.

The output of the Colar Gold-field for October is reported at 41,834 oz. crude, being 884 oz. less than in September, but 2,039 oz. more than in October, 1899. For the 10 months ending October 31st the total was 409,831 oz. crude, against 364,412 oz. in 1899, showing an increase of 45,419 oz., or 12.5%. The total this year was equal to 368,848 oz. fine gold, or \$7,624,088.

CANADA.

British Columbia—Boundary District.

(From Our Special Correspondent.)

Mother Lode.—Last March the British Columbia Copper Company, of New York, decided to add to the machinery already in use at its Mother Lode Mine. A cross compound Corliss condensing Ingersoll-Sergeant air compressor, with receiver intercooler. The high and low-pressure steam cylinders are to be 22-in. and 40-in. diameter respectively, the air cylinders of the piston inlet type, 19¼-in. and 32¼-in. respectively and 48-in. stroke, the machine to have a capacity of 30 to 40 drills. The company also ordered two 66 by 16 horizontal return tubular boilers, each 100 H. P. for 125 lbs. working pressure; a 54-in. by 12-ft. air receiver; a feed-water heater for 350-H.-P. boilers; 10 E 24 drills; 2 double-screw and 10 single-screw columns with arm and clamp; 2 iron safety platform cages, with safety device and shield roof; 2 6-ft. sheave wheels; 1,500 ft. of 1¼-in. wire rope, and 6 steel ore cars, with McCaskell wheels and axles. The greater part of this plant has now been received and some of it installed. The compressor will be ready in about 6 weeks. A large hoisting engine, ordered in June, is due to arrive this month. Ore shipments to the company's smelter began recently and more than 1,000 tons are now in the smelter ore bins. The ore is turning out well, bulk values being satisfactory, and development work at both 200 and 300-ft. levels showing plenty of ore available.

British Columbia—Vancouver Island.

Van Anda Mining Company.—According to press dispatches Harry W. Treat, who owns a proprietary interest in the stock of the Van Anda Mining Company, has bonded that copper property, comprising a mine and smelter, to New York and Chicago men for a large sum, stated to be as much as \$750,000.

British Columbia—West Kootenay District.

(From Our Special Correspondent.)

Rossland Ore Shipments.—The shipments of ore from Rossland mines for 10½ months ending November 15th amounted to 186,000 tons, valued at \$2,976,000 gross.

Bonanza.—According to the superintendent, S. W. Hall, the tunnel is in 67 ft. and has followed the ledge all the way. The walls are well defined with deorite on the hanging and porphyry on the foot. The pay streak is 3 ft. wide at the bottom and 18 in. at the top. The ore is a mixture of sulphides.

Rossland Chamber of Mines.—An association of mining men with this title has just been formed. J. B. McArthur and W. J. Whitesides have been respectively elected president and secretary pro tem.

West Kootenay Power and Light Company.—The management is about to increase its capacity by the addition of 10,000 H. P. It is proposed to sell the power at a lower rate than formerly.

Ontario—Lake of the Woods District.

(From Our Special Correspondent.)

Exploration Party No. 10, in charge of John McAree, of Rat Portage, one of the parties sent out last summer to explore Northern Ontario, returned to Rat Portage on November 12th. It

saw nothing but Lorientian rocks, excepting one or two narrow bands of Huronian.

There is high water now on all the lakes and streams of the Rainy River District, owing to the heavy rains in September and October. Navigation closing, many of the smaller craft being already laid up.

Ontario—Sudbury District.
(From Our Special Correspondent.)

The Mond Company is erecting a costly plant at Victoria Station, about midway between Whitefish and Worthington, on the "Soo" branch of the Canadian Pacific. The Mond Company's ores will all be smelted there, those from its Denison Mines being carried on an elevated wire rope tramway 2½ miles, and the ores from the Levack Mines brought over the Canadian Pacific a distance of over 50 miles.

COAL TRADE REVIEW.

New York.
Anthracite.

Nov. 23.

There is such a brisk demand for anthracite from all consuming territories that the pressure on dealers is actually greater now than it was during the strike. Sales-agents and jobbers at both Eastern and Western points are overwhelmed with orders for immediate delivery and have much trouble making insistent purchasers understand why immediate delivery is impossible. Buyers fail to understand why cars should be in short supply unless they have strayed to soft-coal mines, and this supposition the soft-coal men contradict. As a matter of fact, cars are in short supply, there is a shortage of water at collieries in certain districts, and most of the floating labor at the mines drifted away during the strike. On top of these causes of diminished production the miners themselves are not working as efficiently as before the strike. The prospects are that it will take a few weeks yet to get things back to normal.

In the West, both in Chicago territory and at the head of the lakes, retail buying did not respond to the cold wave as was expected. Evidently many householders have stocked up pretty well or will burn soft coal this winter. The supplies on docks at Duluth are still scanty. Fair amounts are going up the lakes from Buffalo, but the movement is kept down by the heavy demand for immediate delivery from all inland points. In Chicago territory, likewise, stocks on docks are light and increase slowly. Lake receipts at Milwaukee are said to be nearly 300,000 tons less than to corresponding date last year. All-rail receipts at Chicago are light.

In the East jobbers and sales-agents find much trouble in satisfying demands for coal; in fact, are often unable. The retail trade responded quickly to cold weather. There is a lot of coal wanted east of Cape Cod and but little going forward. Buyers at Boston who talked of getting coal at their own terms when the strike should be declared off now talk differently. At New York retailers have advanced prices 50c. Wholesale prices are naturally firm, with little prospect of weakening for some time. We know of one cargo of a special size that sold at New York this week for 25c. above list prices.

Regular quotations for free burning white ash, f. o. b. New York Harbor port are: Broken, \$4; egg, \$4.25; nut and stove, \$4.50; pea, \$3; buck-wheat, \$2.50.

Bituminous.

The pressure for coal in the Atlantic seaboard soft coal trade has increased during the past week, owing to the small amounts received by consumers. This limited supply is due chiefly to the very limited car supply at the mines. All classes of coal are affected more or less. Producers have sometimes been unable to get 50% of the cars they wanted during the week and but seldom 70%. The average car supply at the collieries has been about 60%. There is as yet no actual shortage of coal for early delivery, but unless the main-line roads provide more cars soon consumers may be pinched.

The far East is calling for considerable coal on old contracts, but there is no very heavy pressure for it, though fair amounts are going forward. Deliveries are limited not only by car supply, but by adverse weather interfering with the movements of coastwise craft. Along Long Island Sound there is a heavy demand for coal. Consumers there were getting all the lower grades they wanted and a fair tonnage of better grades when the sudden shortening of a car supply cut down shipments from the mines. New York Harbor trade is quiet. The outlying territory about New York is trying its best to stock up, but finds difficulty in doing this. All-rail trade is taking a fair amount of coal—all the better grades it can get and a fair proportion of the lower grades. Foreign trade shows a falling off in demand, though cargoes are going abroad steadily.

Transportation from mines to tide-water is irregular. Car supply at the collieries causes much complaint. Most producers get 40% less than the whole number of cars wanted. In the coast vessel market, vessels are very scarce, due to bad weather and adverse winds along

shore. We quote current rates for large vessels from Philadelphia as follows: Providence, New Bedford and the Sound, 65c.; Boston, Salem and Portland, 75c.; Wareham and Portsmouth, 80c.; Lynn, 85c.; Newburyport and Bath, 95c. @ \$1; Bangor, \$1.05 @ \$1.10; Gardiner, \$1 @ \$1.10 and towages; Saco, \$1.10 and towages.

Birmingham, Ala. Nov. 19.
(From Our Special Correspondent.)

The coal production is greater than ever, but there is demand for every ton mined. State Mine Inspector J. deB. Hooper, in his report reiterates his estimate of 8,500,000 tons. Last year the production was 7,484,778 tons. Labor troubles do not worry the district.

The Mississippi River barge line trade continues exceedingly active with no indications of a let-up in the next 5 or 6 months. Two boats are now working the barge line, besides the little tug boat which is working around the starting point, Greenville, Miss. The Southern Railway is behind the barge line and is guaranteeing delivery of the coal. Representatives of large dealers and consumers in Louisiana have been at Birmingham investigating as to coal production. Alabama coal is still proving satisfactory in Louisiana.

Chicago. Nov. 20.

(From Our Special Correspondent.)

Anthracite Coal.—The fact that there exists a scarcity of anthracite coal in this city is the main reason that prices have been maintained. The situation is favorable for the continuation of present prices all winter, while assertions are freely made that hard coal will go higher. The demand from all sources for the week was rather larger than the preceding week. Lots of the small dealers from out of town are practically out of hard coal and are fairly begging the shippers for further supplies, but are getting little. Prices are firm at \$6 for all sizes.

Bituminous coal has not been in much demand, many of the larger concerns having already placed their contracts, and the week's business has been mostly in small lots for those who buy about enough for actual wants. The main increase in the soft coal line has been in coal coming from West Virginia and Kentucky for domestic purposes. This line of coal has been very much in demand because of the high price on anthracite.

Cleveland, O. Nov. 21.

(From Our Special Correspondent.)

Between the scarcity of coal cars and the delays to the lake boats by the severe storms and dense fogs the coal shippers are in despair of being able to get much more of their product up the lakes this year than has already been sent. Last week the rates were about 25c. to all ports. The vessel owners have come into absolute possession of the market. To-day the rates from all south shore points to all upper lake ports have been fixed at 50c. and even at that the owners are not able to fill all of the demands that are made of them for tonnage. Coal cars also are getting scarcer and scarcer and whereas the railroads were able a short time ago to fill 80% of their orders for empties, the shippers are satisfied now with about 60%. The soft coal movement appears to be very light, but the shippers are not worrying much because they have exceeded in shipment the amount they hoped to have on the upper lake stock piles at the end of the year. The anthracite shipment is heavier and consequently Erie and Buffalo are drawing heavily on Cleveland's supply of tonnage. The sales of coal are now mostly for domestic purposes and the prices are unchanged.

Pittsburg. Nov. 21.

(From Our Special Correspondent.)

Coal.—The only change in the coal situation is the prospect of a rise in the rivers to-morrow, which will let on a lot of the coal tied up in the harbor. There are fully 30,000 bus. of coal loaded and ready to go to the Southern markets and the rains of the past few days have swelled the rivers and it is believed that fully 10,000,000 bus. can be sent out. There is a shortage of coal in the lower markets and it is possible that prices may advance. The Monongahela River Consolidated Coal and Coke Company, the river coal combination, has not made any announcement of an advance and it is probable that there will be no change. At the convention of the miners of the Irwin field last Saturday it was decided to leave the question of rate for mining coal for Eastern shipment to the national convention of the United Mine Workers, which will be held in January. The Pittsburg Coal Company, the railroad combination, is still behind in its deliveries. It will fill all its contracts for the Northwestern trade, the officials claim, and they will exceed last year by fully 500,000 tons.

Connellsville Coke.—There was an unexplainable falling off in the production last week of over 10,000 tons. Prices remain the same as last week—\$2 for furnace and \$2.25 @ \$2.50 for foundry. The outside producers are selling furnace at \$1.50 and foundry at \$1.75 @ \$2. Of the 20,960 ovens in the region, 14,926 are active and 6,034 are idle. The production last week was 143,573 tons, a decrease of 10,165 tons compared with the produc-

tion of the previous week. The shipments for the week aggregated 7,523 cars, distributed as follows: To Pittsburg and river tipples, 2,654 cars; to points west of Pittsburg, 3,237 cars; to points east of Connellsville, 1,632 cars. This is an increase of 283 cars.

Shanghai, China. Oct. 17.

(Special Report of Wheelock & Co.)

Coal.—Japan coal is unchanged; Welsh-Cardiff is weak, and Sydney Wollongong shows a moderate demand. Arrivals of all kinds of coal during the fortnight were 15,162 tons. We quote per ton: Welsh Cardiff, 27 @ 28 taels (\$17.98 @ \$18.65); Australian Wollongong, cargo, ex-go-down, 13 taels (\$8.66); and other sorts, 7.50 @ 8.50 taels (\$4.99 @ \$5.96); Chinese, Kaiping lump, 7.50 @ 10 taels (\$4.99 @ \$6.67); dust, 5 taels (\$3.33), and mixed, 5.50 @ 6 taels (\$3.66 @ \$4); Japan, all contracted for.

Kerosene Oil.—Very little has been done, and the market is very weak, principally due to tight money, two native banks having failed with large liabilities. Stocks are estimated at 1,005,000 cases American; 304,650 cases Russian, and 10,870 cases Sumatra; total, 1,320,520 cases. Quotations per case are as follows: American Devoo's, 2 taels (\$1.34); Russian Batum Anchor Chop, 1.95 tael (\$1.30); Star & Crescent and Ram Chop, 1.91½ taels (\$1.28); bulk oil, in 2 tins, 1.81½ taels (\$1.22); Sumatra Langkat, bulk in 2 tins, 1.81½ taels (\$1.22).

Foreign Coal Markets.

Messrs. Hull, Blyth & Company, of London and Cardiff, report under date of November 10th that the coal market is weak, with little demand. Prices are: Best Welsh steam coal, \$4.80 @ \$5.16; seconds, \$4.68 @ \$4.80; thirds, \$4.32; dry coals, \$4.68; best Monmouthshire semi-bituminous, \$4.44 @ \$4.56; seconds, \$4.32; best small steam coal, \$2.40 @ \$2.46; seconds, \$2.16 @ \$2.28; other sorts, \$1.74.

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.

In freights from Welsh ports a rather steadier tone is manifest, especially to Mediterranean points. The rate from Cardiff to Marseilles is quoted at \$2.20; Genoa or Naples, \$2.34; Las Palmas, \$1.98; St. Vincent, \$2.16; St. Lucia, \$2.28; Buenos Aires, \$3.12; Rio Janeiro, \$3.48.

There is nothing new in the French trade; the strike in the Pas-de-Calais is still unsettled.

In Germany there is a strong feeling manifest against the coal syndicates, but it is doubtful whether this results in anything more than talk.

There is nothing new here with regard to export business. Inquiries continue to come in frequently, but no new contracts are reported. Freights to European ports are unchanged.

A charter from Philadelphia to Port Elizabeth, South Africa, is noted this week at 26s. (\$6.24) sailing in December. We also learn that a charter was booked abroad from Cardiff to Vera Cruz at 11s. (\$2.64), which is 1s. 6d. (36c.) less than was recently taken.

SLATE TRADE REVIEW.

New York. Nov. 23.

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'ville.	Bangor.	Bangor Kibbourn.	Alb'n, or Jackson Bangor.	Chap'n, or Key's no.	Peach Bottom.	Sea Gr'n.	Unfed'g Green.	Red.
24 x 14	6.50	3.50	3.00	3.00		5.10	2.90		
24 x 12	6.60	3.50	3.00	3.00	3.80	5.25	2.90		
22 x 12	6.60	3.50	3.25	3.00		5.25	2.90	3.75	
22 x 11	6.50	3.75	3.25	3.00	4.00	5.25	2.90	4.00	
20 x 12	6.90	3.75		3.00		5.25	2.90	3.75	
20 x 11	6.80			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	15.50
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	3.00		5.25	2.85	4.00	10.50
16 x 9	7.00	4.25		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	6.60	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	6.60	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	4.25	10.50
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

Another week of quiet, and demoralized prices by excessive competition. In the first half of this month the shipments from Slatington and Walnutport, Pa., were 14,740 squares roofing slate; 333 cases school slates and 1,340 crates blackboards.

The exports of slate from New York in October were valued at \$31,102, making a total for the 10 months this year of \$357,199, showing a

decrease of \$372,704, as compared with 1899. The exports of roofing slate this year were 55,300 squares, as against 132,250 squares in 1899; a decrease of 76,950 squares in 1900. The total movement of mill stock in the same 10 months this year was valued at \$55,905, showing a falling off as compared with last year.

IRON MARKET REVIEW.

NEW YORK, Nov. 23, 1900. Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending				From	
	Nov. 24, 1899.		Nov. 23, 1900.		Jan., '99.	Jan., '00.
	F'ces.	Tons.	F'ces.	Tons.	Tons.	Tons.
An'racite & Coke.	258	282,775	171	267,950	11,805,154	12,341,467
Charcoal.	29	7,375	30	8,150	250,522	341,235
Totals..	287	290,150	201	216,100	12,055,676	12,682,702

Business continued very active in foundry and basic pig, though Bessemer is still dull. In billets and finished material there have also been large transactions. In fact the general belief is that there is a large business in sight; though there is an impression also that it is a trade which will not stand much rise in prices.

The railroads seem to have taken the new activity in the trade seriously and to have accepted the current price for steel rails. Some large orders have been placed, both by Eastern and Western roads.

Export business is quieter, in view of the somewhat uncertain conditions of the trade in England and Germany.

Birmingham, Ala. Nov. 19.

(From Our Special Correspondent.)

The iron market continues quite active and the furnacemen are pleased with the prospects. The statement is made that the furnace companies sold the first 10 days of this month more iron than they can manufacture during the whole month, and it is believed that this statement is true. Though some furnaces now in blast will shortly need repairing, other furnaces which have been idle some time are being put in condition. It is believed that before the end of this year the greater part of the surplus iron on the yards here will have been moved off or disposed of.

The Tennessee Coal, Iron and Railroad Company has declared the third advance in quotations, making this advance 25c. on the ton.

Finished iron and steel are better also, and the mills are doing better than for some little time. Four of the 12 open-hearth furnaces at the Ensley steel plant are in operation and preparations are being made for 2 more to go into blast the coming week. At the steel wire and rod works at Ensley the company is behind with its orders and is running the plant nights. The rolling mills at Bessemer, Birmingham and Gate City continue to work steadily.

The following quotations are given: No. 1 foundry, \$11.50@12.50; No. 2, \$10.50@11.50; No. 3, \$10@10.50; No. 4, \$9.50@10; gray forge, \$9.50; No. 1 soft, \$11.50@12.50; No. 2, \$10.50@11.50.

Rumors concerning changes in the directorate of the Tennessee Coal, Iron and Railroad Company continue to be circulated, but nothing definite is known.

Buffalo. Nov. 21.

(Special Report of Rogers, Brown & Co.)

The large volume of business in foundry and forge iron which sprung into existence about three weeks ago, continues without abatement, and as one by one the furnaces producing iron find their books loaded with orders which afford little if any margin of profit, prices are marked up until there is in this field an advance ranging from 50c. to \$1.50 per ton, according to the brand and grade under consideration. The closing days of canal navigation are marked by an unusual rush of shipments by that route, temporarily absorbing the shipping facilities of local furnaces. Altogether the trade is in a healthy condition and if prices do not go to a prohibitive level through an excessive demand, there is every prospect for a heavy consumption on a large scale. There is sufficient confidence in these conditions to induce a number of the larger buyers to seek to cover their requirements for the first half of the coming year. We quote below, on the cash basis, f. o. b. Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$15.50; No. 2, \$15; Southern soft No. 1, \$16; No. 2, \$15.50; Lake Superior charcoal, \$18; coke malleable, \$14.50.

Chicago. Nov. 20.

(From Our Special Correspondent.)

Pig Iron.—The large demand noticed for pig iron in this market for the past month or two still continues. The furnace companies have had another very satisfactory week, the sales of iron to foundrymen footing up at least 30,000 tons. Some of the idle furnaces hereabouts are being blown in and production will soon be very much augmented. The furnaces report but small stocks at present. There has been some cutting

of prices, mainly by the smaller concerns, but quotations are now firmer. Quotations on pig irons are as follows: 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, \$15.35@15.60; No. 2, \$14.35@14.60; No. 3, \$13.85@14.35; Southern, No. 1 soft, \$15.35@15.60; No. 2 soft, \$14.35@14.60; Lake Superior charcoal, \$17@17.50; local coke foundry, No. 1, \$15@15.50; No. 2, \$14.50@15.50; No. 3, \$14@14.50.

Cleveland, O. Nov. 21.

(From Our Special Correspondent.)

Iron Ore.—A few wild cargoes of ore appearing at Duluth and a few more in prospect at Escanaba has caused a flurry in the lake freight market. This, together with the entire absence of boats caused by the severe storms and the consequent delays, has stiffened the rates very materially. Whereas owners were content, recently, with 50c. from all ports, a charter has recently been made from Duluth at 75c. and vessel men are now demanding \$1 from all points, with a show of getting it if conditions do not change soon on the lakes, all boats at present being storm-bound. The conditions as to prospective ore sales have not changed, but the outlook for future prices is better. All price negotiations will be postponed until the market conditions are more settled. In the meantime association prices are quoted as follows: Bessemer, \$5.50; non-Bessemer, \$4.25, and Mesabi ores on a basis corresponding to the non-Bessemer. The movement of ore from the lake stock piles to the furnaces is increasing.

Pig Iron.—Sales have been extraordinarily heavy. The stock piles have been lowered greatly in the last week and the capacity of the furnaces is now filled for some time to come, some furnacemen refusing to take further orders. Prices on foundry irons remain at \$14.50 for No. 1 and \$14 for No. 2. Basic irons have advanced to \$13, several large orders being taken. The Bessemer market is still dull.

Finished Material.—The sales of plates have been so heavy recently that many of the mills now announce that their capacity is covered for from five to six months ahead, those which are still open to orders being the exception. The price remains firm at 1.35c. This week the American Ship-Building Company closed for 10,000 tons of plates which were ordered conditionally before the election. The same conditions prevail in structural material. Bars have advanced to 1.25 and large sales have been made on that basis. One order for 10,000 tons of steel rails has been placed by an electric line at \$26, the association price, thereby practically settling the dispute over the price as far as this territory is concerned.

Old Iron.—There has been a very much heavier business in scraps this week than at any period in the last six or eight months. The business that has been holding off for the last half-year seems to be unloading itself now, with the result that prices are stiffening. The following quotations might be made: Old Iron rails, \$18; stove cast, \$8; machinery cast, \$12; No. 1 wrought, \$13.

Philadelphia, Pa. Nov. 22.

(From Our Special Correspondent.)

Pig Iron.—The advance in prices made has every appearance of permanency except that consumers are ordering with extreme caution, especially in foundry irons. In fact, while the pig iron market shows elements of undoubted strength elsewhere, in eastern and middle Pennsylvania this is lacking. Since Monday quite a number of moderate-sized orders have been booked at good prices, but in cases where top prices as compared to other markets were asked, sales were not made. Until there are some stronger evidences that iron should be dearer the advances will be limited to 25c. or 50c. No. 1 foundry, \$16.50@17; No. 2, \$15.75@16.25; No. 2 plain, \$15@15.25; standard gray forge, \$14@14.50; ordinary, \$13@13.50; basic, \$14.

Billets.—The established price of \$19.75 is accepted, but not without misgivings in some quarters as to its permanency.

Merchant Bar.—Several influences have recently combined to improve the market. Prices have advanced, especially on the deliveries now being asked for. We are promised a large amount of business in car building iron soon. The store demand continues to improve. Vehicle requirements also have broadened out. The mills are doing well. Prices, 1.35@1.50c.

Pipes and Tubes.—A good deal of new work is now appearing and the prices quoted show that it is possible to make advances, particularly where promptness of delivery is an element. But late deliveries are to be had at concessions just now, though manufacturers say these may be suddenly withdrawn. The market has a decidedly strong undertone and some big contracts are now being figured on.

Sheets.—Orders under advisement for about a month, in the shape of options, were placed this week. Business in sheet iron of any kind is not

now being sought for except at full prices. No. 19 is 2.30c.; No. 28, 3.40c.

Merchant Steel.—Large Eastern consumers have submitted propositions for merchant steel supplies for the winter and spring on a basis which virtually amounts to concessions, but which are in fact summer quotations.

Plates.—A large amount of business has been placed in plate mills within a short time. The probability of lower quotations has been disposed of. This branch of the trade is strong and the mills are well filled with work. Quarter-inch, 1.40@1.50c.; universals, 1.40c.; shell, 1.50@1.60c.; flange, 1.70@1.80c.

Structural Material.—Heavy orders are being placed at all mills and some recent buyers who imagined their orders could be filled very quickly were surprised this week by being told they would have to wait their turn. Prices are more likely to advance than decline in view of the price of raw material and the probability of further advances, but for which builders, by the way, consider there is no justifiable reason. Angles, 1.65@1.75; beams and channels, same.

Steel Rails.—The placing of orders during the past few days for over 200,000 tons in the various steel mills is given to-day as a reason why the railroad companies might as well discontinue their fruitless opposition to the \$26 rate fixed.

Scrap.—There is something like a revival of the flurry of last year for scrap in certain quarters. Choice railroad is \$17@17.50; steel axles, \$17.50; heavy steel scrap, \$14@15; cast borings, \$7.50@8; machinery cast, \$14@14.50; No. 2 light scrap, \$11@11.50; old car wheels, \$17.

Pittsburg, Pa. Nov. 21.

(From Our Special Correspondent.)

The only feature of the iron and steel market this week was the heavy sales of foundry and forge iron. Prices are firmer than last week and the sales extended throughout the first half of 1901. Fully 15,000 tons of foundry and forge iron were sold during the week, while not more than 1,500 tons of Bessemer pig iron was sold. The Bessemer Furnace Association has not yet fixed the prices for next year's delivery, but sales are 50c. a ton higher than last week, the quotations ranging from \$13.90 to \$14.50 delivered at Pittsburg. A large number of inquiries have been received for Bessemer iron and the association will hold a meeting soon to determine the rate. As already told in this paper, the price will not be less than \$14 at the Valley furnaces according to the present outlook, which makes the price \$14.50 delivered at Pittsburg. Foundry No. 2 is fully \$1 a ton higher this week on the maximum quotation of last week and gray forge is 25c. a ton higher. There is no change in the steel market with the exception of bars, which have advanced. Bessemer steel billets will continue at \$19.75, Pittsburg, for the present and there is no indication of an advance. All prices on structural material are firm and the demand continues good. The mills in this district have enough orders on hand at present to keep them busy for many months. The question of wages has been fixed at all the steel plants, the Mingo works of the National Steel Company being the last, where negotiations were pending for several days between officials of the Amalgamated Association and representatives of the company. The works had been idle since June 30th, when the last scale expired. The company offered a reduction, owing to the improved machinery introduced which enabled the workmen to increase the tonnage.

The Carnegie Steel Company has commenced to ship 10,000 tons of structural shapes and plates to be used in the construction of dock piers for the Mexican Southern Railroad at Tampico, Mex. The material at the time the order was placed was approximately \$400,000 at the mills here. All the bi-monthly examinations of sales of iron, sheets and tin plate for the months of September and October on which the wages for November and December are based were made during the week. Owing to the low prices that ruled before election wages in the rolling and tin-plate mills are reduced, but the sheet workers' wages remain unchanged. The puddlers are reduced to the base of the scale, which is \$4.75 a ton and the wages of the finishers are cut 4%, but are still 4% above the base. The wages of the tin-plate workers are reduced to the base, which is a cut of 8%, due to the reduction in the price of tin plate by the combination of from \$4.65 to \$4 a box. The base of the sheet scale is 3c. a pound and as sheets have not been selling above that price for several months, the wages of the workers will continue. The wages of the puddlers and finishers in the rolling mills may be advanced on the first of the year, as the price of bar iron on which the wage scale is based has been advancing since the first of the month. There will be no change in the wages of the tin plate workers, as the American Tin Plate Company announced during the week that the rate of \$4 a box will continue until April 1st.

Pig Iron.—Owing to the failure of the Lessemer Furnace Association to fix the price of Bessemer iron, the sales this week were small, not

more than 1,500 tons having been sold. The price was an improvement over last week, ranging from \$13.90 to \$14.50 a ton delivered in Pittsburgh. The sales of foundry and gray forge iron were unusually heavy, aggregating 15,000 tons. No. 2 foundry iron sold at \$14.75@15.50, Pittsburgh, and gray forge \$13.10@13.25.

Steel.—There is no change in Bessemer steel billets, the price remaining at \$19.75, Pittsburgh, but few sales were made. Steel bars have advanced \$1 a ton and are quoted this week at 1.25@1.30c. Tank plates remain at 1.35c.

Sheets.—There is a good demand for sheets, but prices are not any better than the rates that have ruled for the past month. No. 27 is still quoted at 2.80c, and No. 28 at 2.90c. Galvanized sheets are 75% off, with 15c. for freight allowance.

Ferro-manganese.—The leading producer dropped the price \$10 a ton this week and 80% domestic in large lots is quoted at \$65 and small lots at \$75.

New York. Nov. 23.

The local iron market is decidedly more lively, with prices firmly held. In foreign trade we note shipments of \$19,000 worth of manufactured steel and \$10,000 worth of pumping machinery to India; shipments of \$10,000 worth of manufactured iron and \$27,000 worth of electrical railroad material to Cuba.

Pig Iron.—There is a firm tone to the market and the volume of business is good. We quote for Northern irons, tidewater delivery: No. 1 X foundry, \$17.25@17.75; No. 2 X, \$15.50@16; No. 2 plain, \$15@15.25; gray forge, \$14.50@14.75. For Southern irons on dock, New York, No. 1 foundry, \$15.50@15.75; No. 2, \$14.50@14.75; No. 3, \$13.75@14.25; No. 4, \$13.25@13.75; No. 1 soft, \$13.50@13.75; No. 2, \$14.25@14.50.

Bar Iron and Steel.—Demand has improved decidedly. Prices are up 10 points. We quote common bars at 1.30c. for large lots on dock; refined bars, 1.40c.; soft steel bars, 1.30c.

Plates.—The pool is maintaining prices firmly. Business is fair. We quote for large lots at tidewater: Tank, 1/4-in. and heavier, 1.50c.; shell, 1.55c.; flange, 1.60c.; marine, 1.70c.; universal, 1.50c.

Structural Materials.—Demand shows improvement. We continue to quote large lots at tidewater: Beams, 1.65c.; channels, 1.65c.; angles, 1.30c.; tees, 1.70c.; zebs, 1.65c.

Steel Rails and Rail Fastenings.—A number of large sales are reported and there are inquiries from abroad, but mostly for small lots. Light rails are selling between \$25@30. Standard sections are quoted at \$26. Splice bars are 1.30@1.35c.; spikes, 1.45c.; fish plates, 1.30c.; bolts, 2.05@2.25c.

Cartagena, Spain. Nov. 3.

(Special Report of Barrington & Holt.)

Iron and Manganiferous Ores.—During October 9 cargoes of iron ore have been shipped from this port, 6 being of manganiferous ore and 3 of dry ore. Since our last report the position of the iron ore market has shown more activity and a few contracts for dry ore and manganiferous ore have been made. The high freights that so much have hindered shipments are now going down and when same has come down to their usual figures many shipments are expected to be made, as there are still large quantities remaining of contracts with delivery this year. With regard to new contracts, sellers do not seem inclined to contract for next year's delivery at prices anything lower than the average figures paid during this present year. Last week everything in this mining district took a stoppage owing to rain and floods, and much damage was done to mining properties in general.

For iron ores quotations are: Ordinary 50% ore, 7s. 3d. @ 7s. 9d. per ton; low phosphorus—under 0.03%—7s. 6d. @ 8s.; extra-low phosphorus—under 0.015%—8s. 6d.; special ore, 9s.; specular ore, 60%, 11s.; lump magnetic ore, 60%, 12s. 6d. For manganiferous ores prices are: No. 1, 20% Mn and 20% Fe, 15s. 3d.; No. 1 B, 17% Mn and 25% Fe, 12s. 3d.; No. 2, 15% Mn and 30% Fe, 12s.; No. 3, 12% Mn and 35% Fe, 9s. 9d. All prices are per ton, f. o. b. shipping port; buyers to pay any new tax that may be levied.

METAL MARKET. New York. Nov. 23. Gold and Silver.

Gold and Silver Exports and Imports At all United States ports in October and year.

Metal.	October.		Year.	
	1899.	1900.	1899.	1900.
GOLD.				
Exports	\$379,752	\$428,925	\$33,257,590	\$53,005,470
Imports	8,542,254	9,810,832	42,810,675	45,915,798
Excess	\$8,162,502	\$9,381,957	\$9,553,085	\$7,089,672
SILVER.				
Exports	4,683,226	6,093,119	43,421,657	53,595,010
Imports	2,321,695	2,966,356	25,045,790	33,117,506
Excess	\$2,361,531	\$3,126,763	\$18,375,867	\$20,477,504

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 23d, 1900, and for years from January 1st, 1900, 1899, 1898, 1897.

Pe-riod.	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	\$12,558	\$11,371	\$666,120	\$693,547	E. \$27,427
1900..	36,659,638	10,070,685	35,452,313	4,391,973	E. 57,049,343
1899..	11,645,849	13,726,982	26,018,947	3,411,057	E. 20,529,757
1898..	7,773,023	95,781,148	20,426,941	2,942,881	E. 60,527,965
1897..	29,708,806	13,515,582	42,222,980	2,782,164	E. 55,634,059

Exports and imports of gold were in small parcels, to and from different ports. Imports of silver were from Mexico and the West Indies; exports went chiefly to London.

The United States Assay Office in New York reports the total receipts of silver at 176,000 oz. for the week. Total since January 1st, 4,518,000 oz.

Average Prices of Silver per oz. Troy.

Month.	1900.		1899.		1898.	
	Lon'd'n Pence.	N. Y. Cents.	Lon'd'n Pence.	N. Y. Cents.	Lon'd'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	56.02
May.....	27.56	59.96	28.15	61.23	26.31	56.98
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	61.63	27.15	58.89	28.05	60.08
October....	29.58	63.83	28.70	57.98	27.90	60.42
November..			27.02	58.67	27.93	60.60
December..			27.21	58.99	27.45	59.42
Year.....			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	4.34	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	4.57	4.15	5.32
Nov.....	16.49		28.51		4.575		4.64	
Dec.....	15.85		25.88		4.04		4.66	
Year.....	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, 16.55c.; for June, 16c.; for July, 16.16c.; for August, 16.58c.; for September, 16.69c.; for October, 16.64c.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars.....	\$.50 1/2	\$.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.

Business continues to develop much activity, though there has been some reaction in the stock markets. The demand for money abroad, however, continues strong enough to keep rates at a point where gold shipments are not probable at present.

The silver market has not been very firm. Offerings have been placed at slight concessions through the week, and the closing is rather dull, with small business.

The United States secretary of legation at Lima, Mr. Neill, under date of October 13th, 1900, transmits copy and translation of a new monetary law issued on the same day by the Peruvian Government. The importance of this measure at the present time, says Mr. Neill, consists in the fact that the gradual rise in the value of silver, which has been going on during the last few months, may continue until 10 soles exceed the value of a pound sterling; the approved project tends to maintain the equivalent value between the national silver and gold moneys, as 10 soles silver to £1 Peruvian gold coin. The text of the law follows:

"Article 1. The Peruvian pound is legal tender of full cancellatory power, equivalent to 10 soles silver.

"Art. 2. The coining of half-pounds is here-

with authorized, subject to the conditions established by the executive.

"Art. 3. The English pound sterling has the same value as the Peruvian gold pound, until otherwise decided by Congress."

Indian exchange is steady at 15.94d. per rupee, with a large demand for Council bills in London. No silver is going forward on Government account just now, though considerable quantities are being shipped by private parties.

The statement of the United States Treasury on Wednesday, November 21st, shows balances

Imports and Exports of Metals.

Port.	Week, Nov. 21.		Year 1900.	
	Expts.	Impts.	Expts.	Impts.
New York.				
(N. Y. Metal Exchange.)				
Aluminum.....long tons		1	137	88
Antimony ore.....				2,668
" regulus.....				1,800
" ore.....				1,500
Chrom. ore.....				17,690
Copper, fine.....	1,097	259	91,687	246
" matte.....	180		3,939	50,261
" ash.....				98
Ferro-Chrome.....				31
Ferro-mangan'ise.....				710
Iron ore.....				21,477
" pig, bar, rod.....	882	10	18,642	6,135
" pipe.....	487		13,618	157
" plates, sheets.....			1,016	18
Lead.....	1,775	675	70,730	61,049
" ore.....				9,700
" cross.....				24
Manganese ore.....				9,492
Metals, old, scrap.....	290	4	4,942	6,194
Composition.....	321		3,414	385
Nails.....	178		17,625	5,393
Nickel.....			2,173	108
" ore, matte.....				5,393
Rail'd material.....	625	75	6,886	5,818
Rails, old.....			7,774	518
Spiegeleisen.....				3,377
Steel bars, plates.....	2,681	181	46,518	15,891
" rails.....	316		59,389	176
" wire.....	592		26,921	78
" not spec'd.....	1,362	30	14,069	2,631
Tin.....		585	5	22,893
" and black plates.....	28	353	28	32,932
" dross.....				442
" ashes, skim.....				745
" ore.....				1,165
				13,304
Baltimore.				
(Special Correspondence.)				
Chrom. ore.....long tons		3,000		6,730
Copper, fine.....	608		35,804	4,364
" matte.....				155
Ferro-manganese.....				4,900
Iron pig, bar, etc.....	110	125	4,900	22,531
" ore.....		7,116		3,4,290
" pyrites.....				37,475
Manganese ore.....				117,913
Metals, old & Rails.....				568
Nails.....	58		1,504	
Pipe, iron & steel.....	7		5,457	
Silicon.....				85
Spiegeleisen.....				1,131
Steel, bars, etc.....	2,467	66	40,808	4,264
" wire.....			919	157
" rails.....	750		74,555	
Tin.....				295
" and black plates.....		145		3,110
Philadelphia.				
(Week ending Nov. 17.)				
Antimony.....long tons				14
Chrom. ore.....				3,650
Copper, fine.....	95		3,989	
" ore.....				35,595
" pyrites.....				100
Iron, pig.....				1,355
" ore.....				13,120
" pyrites.....				270, 95
Manganese ore.....				87,455
Spiegeleisen.....				77,326
Tin.....				4,153
" and black plates.....		3		618
Zinc.....				2,593
" ore.....		750		5,057
Total United States.				
Articles.	Sept. 1900.		Year, 1900.	
	Expts.	Impts.	Expts.	Impts.
Antimony.....long tons		202		1,208
Copper, fine.....		80		1,753
" ore.....				35,595
" pyrites.....				100
Iron, pig.....				1,355
" ore.....	10,425	11,785	126,151	54,394
" pyrites.....	42,888	4,876	168,432	59,542
" pyrites.....	16,259	59,995	37,026	697,297
Iron & steel plates.....	4,539	105	33,728	4,793
Iron & steel rails.....	33,132	2	294,411	991
" wire.....	3,880	154	59,155	1,338
Lead, in all forms.....	9,004	9,362	65,219	74,636
Manganese ore.....				247,548
" and oxide.....		21,193		3
Nickel.....				2,030

In excess of outstanding certificates as below, comparison being made with the statement of the corresponding day last week:

	Nov. 14.	Nov. 21.	Changes.
Gold.....	\$94,810,561	\$92,962,923	D. 1,847,638
Silver.....	8,910,193	7,449,741	D. 1,460,452
Legal tenders.....	10,201,808	10,747,473	I. 545,665
Treas. notes, etc....	107,592	93,251	D. 14,341
Totals.....	\$114,060,154	\$111,253,388	D. \$2,806,766

Treasury deposits with national banks amounted to \$96,751,929, showing a decrease of \$472,668 for the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House for the week ending November 17th—gives the following totals, comparison being made with the corresponding weeks in 1899 and 1898:

	1898.	1899.	1900.
Loans and discounts.....	\$693,765,499	\$679,762,209	\$787,846,100
Deposits.....	786,432,900	736,836,900	859,670,100
Circulation.....	15,971,100	16,462,300	30,677,500
Reserve:			
Specie.....	159,353,600	136,778,300	158,852,500
Legal tenders.....	53,922,000	47,118,900	58,734,800
Total reserve.....	\$213,275,600	\$183,897,200	\$217,587,300
Legal requirements.....	196,608,225	184,209,225	209,917,525
Balance, surplus.....	\$16,667,375		\$7,669,775
Deficit.....		\$312,025	

Changes for the week, this year, were increases of \$2,189,600 in loans and discounts, \$5,578,300 in deposits, \$2,595,800 in specie, \$2,612,500 in legal tenders, and \$3,063,725 in surplus reserve; a decrease of \$28,200 in circulation.

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

Banks.	1899.		1900.	
	Gold.	Silver.	Gold.	Silver.
N.Y. Ass'n.....	\$136,778,300		\$158,852,500	
England.....	159,504,265		159,500,250	
France.....	377,764,295	\$233,469,645	463,522,605	\$221,933,905
Germany.....	1,629,000,000	61,970,000	125,510,000	64,655,000
Spain.....	68,000,000	69,270,000	68,985,000	81,800,000
Aus.-Hun.....	153,785,000	52,245,000	190,480,000	48,495,000
Neth'ld's.....	17,205,000	28,920,000	21,370,000	27,275,000
Belgium.....	14,700,000	7,350,000	14,250,000	7,125,000
Italy.....	77,320,000	7,215,000	77,080,000	8,380,000
Russia.....	427,800,000	22,060,000	353,555,000	30,250,000

The returns of the Associated Banks of New York are of date November 17th, and the others are of date November 16th, 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 November 8th, 1900, are reported by Messrs. Pixley & Abell's circular as follows:

	1899.	1900.	Changes.
India.....	\$4,597,025	\$5,436,307	I. 839,282
China.....	1,158,682	1,953,016	I. 794,334
The Straits.....	265,596	742,316	I. 476,730
Totals.....	\$6,021,303	\$8,131,639	I. \$2,110,336

Arrivals for the week, this year, were £198,000 from New York, £4,000 from Chile, and £4,000 from Australia; total, £206,000; all bar silver. Shipments were £126,000 in bar silver to Bombay and £44,050 to China; total, £170,050.

Receipts of specie at San Francisco by water for the 10 months ending October 30th were:

	Gold.	Silver.	Totals.
Coin.....	\$17,556,612	\$624,950	\$18,181,562
Bullion.....	259,898	1,720,285	1,980,183
Totals.....	\$17,816,505	\$2,345,235	\$20,161,740

The receipts were from the following sources: Mexico, \$2,513,255; British Columbia, \$123,578; Central America, \$40,985; Australia, \$12,465,205; China, \$7,845; Japan, \$4,672,151; South America, \$2,108; Hawaiian Islands, \$336,613.

The foreign merchandise trade of Great Britain for the 10 months ending October 31st is given by the Board of Trade returns as below:

	1899.	1900.
Imports.....	\$400,134,971	\$427,646,786
Exports.....	272,274,361	296,244,112
Excess, imports.....	\$127,860,608	\$131,402,674

The increase in imports was £27,511,815, or 6.8%; in exports £23,969,748, or 8.8%. The movement of gold and silver for the 10 months was as follows:

	Imports.	Exports.	Excess.
1900.....	\$22,494,739	\$13,555,900	Imp. \$8,938,839
1899.....	29,358,071	18,210,915	Imp. 11,147,156
Silver:			
1900.....	10,704,917	11,258,900	Exp. 553,983
1899.....	10,825,263	11,799,891	Exp. 974,628

Of the silver imported this year £9,195,216, or 85.9%, was from the United States. This includes a considerable quantity of Mexican silver refined here.

Other Metals.

Daily Prices of Metals in New York.

November.	Sterling Exchange.	Silver.		Copper.			Lead.		Spelter.	
		Fine oz.	London.	Lake.	Electrolytic.	London.	Tin.	cts.	N. Y.	St. L.
17	4.84 1/2	64 1/2	29 1/2	16 1/2	16 1/2	28 1/2	4.32 1/2	4.30	4.12 1/2	
19	4.84 1/2	61	29 1/2	16 1/2	16 1/2	28 1/2	4.32 1/2	4.30	4.12 1/2	
20	4.8 1/2	61	29 1/2	16 1/2	16 1/2	28 1/2	4.32 1/2	4.32 1/2	4.15	
21	4.84 1/2	63 1/2	29 1/2	16 1/2	16 1/2	28 1/2	4.32 1/2	4.35	4.15	
22	4.84 1/2	63 1/2	29 1/2	16 1/2	16 1/2	28 1/2	4.32 1/2	4.35	4.15	
23	4.84 1/2	63 1/2	29 1/2	16 1/2	16 1/2	28 1/2	4.32 1/2	4.35	4.15	

London quotations are per long ton (2,240 lbs.) standard copper which is now the equivalent of the former 22 1/2 lbs. 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 unchanged. Consumption both here and abroad continues very large. A fair export business is reported this week, mostly for early shipment, indicating again that manufacturers abroad are not well covered. A good domestic business has also been done. We quote Lake copper at 16 1/2 @ 16 1/2 c.; electrolytic in cakes, wirebars and ingots at 16 1/2 @ 16 1/2 c.; in cathodes at 16 1/2 @ 16 1/2 c.; casting copper at 16 1/2 c.

The market for standard copper in London has again improved. It closed last week at £72 2s. 6d. for spot, £72 17s. 6d. for three months, and opened this week 2s. 6d. higher. On Wednesday it advanced to £72 12s. 6d. for spot, £73 7s. 6d. for three months, and it closes at £72 13s. 9d. for spot, £73 5s. for three months.

Statistics for the first half of November show an increase in the visible supplies of 600 tons. Refined and manufactured sorts we quote: English tough, £75 5s. @ £75 15s.; best selected, £73 10s. @ £79; strong sheets, £86; India sheets, £83 @ £84; yellow metal, 7d.

The steamer "Afridi" arrived at New York this week with 3,896 ingots of copper from Japan.

Imports of copper into Great Britain for the 10 months ending October 31st were, in long tons:

	1899.	1900.
Copper ore.....	101,986	88,713
Matte and precipitate.....	69,461	73,174
Fine copper.....	49,812	60,925
Equivalent, fine copper.....	94,742	106,383

The total equivalent fine copper shows an increase of 11,641 tons, or 12.3%. Of the imports this year 1,052 tons ore, 6,850 tons matte and 24,347 tons fine copper came from the United States.

Tin.—The market has been active, with heavy purchases on the part of consumers generally. Tin for early delivery is again rather scarce and arrivals in the near future are small. A further premium on spot tin can, therefore, be expected. At the close we quote spot tin at 29c., December delivery at 28 1/2 c.

The London market, which closed last week at £128 5s. for spot, £127 for three months, opened 10s. lower, and on Tuesday declined further 7s. 6d. On Wednesday, however, a sharp advance took place to £128 for spot, £127 for three months, which was followed on Thursday by a further advance to £129 for spot, £127 17s. 6d. for three months. At the close the quotations are £129 for spot, £128 5s. for three months.

Imports of tin into Great Britain for the 10 months ending October 31st were, in long tons:

	1899.	1900.
Straits.....	16,205	20,165
Australasia.....	2,532	2,415
Other countries.....	3,724	4,234
Total.....	22,461	26,874

The increase this year was 4,433 tons, or 19.7%. Exports of tin were 15,721 tons, against 15,331 tons last year.

Lead.—There is no change in the market, a good business being done from day to day at last prices. The ruling quotations are 4.32 1/2 @ 4.37 1/2 c. New York, 4.22 1/2 @ 4.32 1/2 c. St. Louis. Our cables report the market for Spanish lead as somewhat lower at £17 1s. 3d., with English lead 2s. 6d. higher.

Imports of lead into Great Britain for the 10 months ending October 31st were, in long tons:

	1899.	1900.
Spain.....	81,185	71,610
United States.....	26,487	34,372
Australasia.....	48,673	46,290
Other countries.....	9,453	12,453
Totals.....	165,798	164,760

The total this year shows a decrease of 1,038 tons, or 0.6%. The lead credited to the United States is chiefly Mexican lead refined here in bond.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is unchanged, 4.22 1/2 c. being the price for Missouri metal, 4.25c. for chemical lead and

4.32 1/2 c. for argentiferous lead. Trading appears to be of a retail character only.

Spanish Lead Market.—Messrs. Barrington & Holt write from Cartagena, Spain, as follows: The average price for silver during October was 15.50 reales per ounce. The average price of lead was 95.94 reales per quintal on wharf, equivalent to a price of £16 5s. 3d. per ton of 2,240 lbs., f. o. b. Cartagena, at an average exchange of 33 pesetas to £1. The export of pig lead during the month has been 1,337,418 kgs. to Marseilles; 600,000 kgs. to Manchester; 443,342 kgs. to Cuernon; 306,718 to London; total, 2,687,478 kgs.

Spelter.—The market has been active. Producers, generally, are well sold, and metal for early shipment is not plentiful. Somewhat higher prices have been paid, and we quote the market as 4.15c. St. Louis, 4.35c. New York.

The foreign market is unchanged, good ordinaries being quoted at £19 5s., specials 5s. higher. Imports of spelter or metallic zinc into Great Britain for the 10 months ending October 31st were 58,400 tons, against 58,791 tons last year, showing a decrease of 391 tons, or 0.7%, this year.

Spanish Zinc Ore Market.—Messrs. Barrington & Holt write from Cartagena, Spain, as follows: The only shipments of zinc ore that can be reported in October are 1,700,000 kgs. blende to Antwerp, Belgium.

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

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

Quicksilver receipts at San Francisco in October were 1,735 flasks; for the 10 months ending October 31st they were 16,992 flasks, against 19,367 last year, and 19,462 in 1899. These receipts do not include quicksilver shipped East or to consumers directly from the mines, but only that coming into the San Francisco market. Shipments from San Francisco by sea for the 10 months were: Siberia, 7; China, 1,000; Australia, 100; Central America, 1,214; Mexico, 3,796; British Columbia, 11; Washington, 5; New York, 20; total, 6,153 flasks, against 9,309 in 1899; showing a decrease of 3,156 flasks, or 33.9% this year.

Imports of quicksilver into Great Britain for the 10 months ending October 31st were 478,983 lbs. (3,812,184 lbs., 1899). Exports were 1,566,097 lbs. (1,872,505 lbs., 1899). This shows an excess of exports this year of 1,087,109 lbs., against an excess of imports amounting to 1,939,679 lbs. in 1899.

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

	Per lb.	Per lb.
Aluminum.....	33 @ 37c.	
No. 1, 99% ingots.....	31 @ 34c.	
No. 2, 99% ingots.....	42c. up	
Rolled sheets.....	20 @ 23c.	
Alum.-bronze.....	33 @ 39c.	
Nickel-alum.....	\$2.25	
Bismuth.....	1.00	
Chromium (over 99%).....	50c.	
Copper, red oxide.....	\$1.00	
Ferro-Molyb'dum (50%).....	80c.	
Ferro-Titanium (10%).....	80c.	
Ferro-Titanium (20%).....	\$1.00	
Ferro-Tungsten (37%).....	32c.	
Magnesium.....	\$2.75 @ \$3	
Manganese (over 99%).....	\$1.05	
Mangan' Cop. (2% Mn).....	32c.	
Mangan' Cop. (3% Mn).....	38c.	
Molyb'denum (Best).....	\$1.45	
Phosphorus.....	50c.	
American.....	70c.	
Tungsten (Best).....	80c.	

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

LATE NEWS.

Mr. Henry F. Lefevre, mining engineer for the New York & Honduras Mining Company, has just arrived in New York from San Juanico, Honduras.

(From Our Special Correspondent.)

Pittsburg, Pa., November 22d.—Big coal tows started for the Southern markets at daylight on a light barge stage of water which had been anticipated for a week. A greater rise is expected, and, encouraged by reports of rainfall at the headwaters of the Allegheny River, the Monongahela River Consolidated Coal and Coke Company hope to send 10,000,000 bush. to the South within 48 hours. The engineers have gone on a strike for higher wages and this has inconvenienced the company in sending out all the towboats ready for service. The engineers who have been secured are not members of the organization.

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 630.)

New York.

Nov. 23.

Heavy Chemicals.—Improved demand. Export orders for domestic bicarb. soda were booked at 87½c. per 100 lbs. f. o. b. works, and for home consumption at \$1.16@1.12½ f. o. b. works for ordinary grades. Bleaching powder shows large 1901 trading. German brands selling at \$1.85.

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%.	70@75		
48%.	75@80		
Caustic Soda, high test.	\$1.70@1.75		
powd., 60%.	2.75@3.00		
70@74%.	2.85@3.25		
85%.	3.25@3.50		
Sol Soda, "conc."	60@70		65@67½
1.12½@1.75			1.75
Bicarb. Soda, 1.12½@1.25			1.37½@1.75
"extra", 3.25@3.50			
Bleach Pdr., Eng. prime.			1.87½@2.00
other brands.			1.75@1.85
Chl. Pot. Cryst. powd.	8.50@8.75		9.37½@9.50
			9.50@9.75

Acids.—Business in acetic acid is good. Oxalic is quiet. Sulphuric is in larger demand. Exports of blue vitriol are better.

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°	\$3.87½
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	5.87½@6.00
Aqua Fortis, 42°	4.50	Sulphuric, 66°	1.20
Muriatic, 15°	1.20	Sulphuric, 60°	1.05
Muriatic, 20°	1.35	bulk 50° ton	14.00
Muriatic 22°	1.50		

Brimstone.—Imports at New York this week were 5,559 tons to be delivered principally on contract. Expected arrivals during the month are the vessels "Aquila" with 1,150 tons, "Pontiac" 1,200 tons, "Starlight" 3,850 tons, "Largo Bay" 3,000 tons, and the "Picqua" with 1,500 tons, a total of 10,700 tons. Best unmixed seconds on spot have sold at \$22 per ton, while shipments are worth \$21@21.25. Best thirds are quoted at \$2 per ton less.

Pyrites.—Market continues good. Prices are unchanged. We quote as follows: Mineral City, Va., lump ore (basis 42%), \$4.75 per long ton and fines \$4.20. Charlemont, 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.—Almost at a standstill, owing to the unwillingness of consumers to purchase at present prices. Shipments of sulphate of ammonia from Great Britain to the United States in October amounted to 673 long tons, against 518 tons last year. Arrivals of sulphate of ammonia are held at \$2.82½@2.85 per 100 lbs. Blood is worth \$2.10@2.15 per unit, f. o. b. Chicago; tankage, 9@20%, \$1.95 and 10c. f. o. b. Chicago; Calcutta bone-meal, regular, \$23 per ton, and "off" grades \$20; domestic steamed ground bone, \$18.50 @ \$19.50 per ton, as to purity. Shipments of potash salts on the Elbe are active before navigation closes.

Nitrate of Soda.—Quiet. Quotations are unchanged at \$1.82½@1.85 per 100 lbs., according to position. In the 10 months ending October 31st Europe imported 948,300 long tons of nitrate of soda and delivered to consumers 1,016,300 tons. Loadings on the West Coast of South America for Europe on November 1st were 149,044 tons, making the visible supply to that date 544,300 tons.

Messrs. Jackson Brothers, of Valparaiso, Chile, write us as follows under date of October 20th: Little interest was shown in nitrate of soda during the first week of the fortnight, some few transactions being made in 95% at 5s. 6d. alongside for October-December deliveries and at 5s. 5d. for January-February. Advices received from Iquique state that the total productive capacity of the "oficinas" had been agreed on the basis of about 31,273,000 qtls. The majority of producers retired from the market awaiting the result of the meeting on October 20th and the few sellers raised their limits to 5s. 7d. steamer terms for October-November deliveries of 95%, at which a few parcels changed hands to cover immediate wants. Buyers on the whole show little inclination to pay the advance, more so as freights are stiffer. The production during September reached 2,478,000 qtls., making a total

for the 9 months of 23,516,000 qtls., against 22,216,000 qtls in 1899, or, say, an increase of 1,300,000 qtls. The consumption of the world during the same period is advised as 25,521,000 qtls., being 618,000 qtls. less than that of last year. We quote October-December 95% at 5s. 6½d. and 96% at 5s. 8d., both ordinary terms sellers. The price of 5s. 6½d., with an all-round freight of 36s. 3d., stands in 7s. 11¼d. per cwt. net cost and freight without purchasing commission. Sales for the fortnight were 390,000 qtls. by first hands and 52,000 qtls. by second hands, making a total of 442,000 qtls.

Phosphates.—Very quiet. Prices nominally unchanged here, but abroad they are easier.

Phosphates.	Per Ton F. o. b.	C. i. f. U'n'd Kingdom or European Ports.	
		Unit.	Long ton.
*Fla. hard rock (77@80%)	\$7.50@8.00	8¼@8¼d	\$12.87@13.28
*Fla. land pebble (68@73)	4.35	7¼@7¼d	10.15@10.50
*Fla. Peace River (58@63)	3.00@3.50	6¼@7¼d	7.50@8.70
*Tena. rock 78% export.	3.50@3.75	7¼@7¼d	11.31@11.70
†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	6¼d	8.10
Algerian, rock... (63@70%)		7@7¼d	9.38@10.05
Algerian, rock... (58@63)		6¼@7¼d	8.10@8.70

*Fernandina. †Mt. Pleasant. ‡At mines. §On vessels, Ashley River.

Liverpool.

Nov. 14.

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

While the market for heavy chemicals seems quiet, there has been more doing than has appeared on the surface, if we are to judge by the Board of Trade export returns for the month ending October 31st, which are as follows: Total shipments to all quarters, including United States, alkali, 334,253 cwts.; bleaching powder, 132,458 cwts. Shipments to United States alone, alkali, 37,021 cwts.; bleaching powder, 86,511 cwts. As compared with the corresponding month of last year there is a marked increase in exports, especially in bleaching powder. While the exports of alkali to several markets, including the United States show a decrease as compared with October, 1899, this falling off is much more than offset by the very heavy exports to Canada, which are almost doubled. In the case of bleaching powder the exports both to United States and other quarters show a marked increase, possibly owing to buyers anticipating their requirements in view of the higher range of values for 1901 deliveries.

Soda ash is in request and dearer for Leblanc makes, which are scarce. Quotations vary according to export market, but the range for tierces may be called about as follows: Leblanc ash, 48%, £5 12s. 6d. @ £5 17s. 6d.; 58% £6 2s. 6d. @ £6 7s. 6d. 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 demand 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 selling at full prices, and although not active there is a steady trade passing. We quote range 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 firm at £6 10s. @ £7 per ton, net cash, for hardwood as to market.

Chlorate of potash is without special feature and quiet at 3¼d. per lb., net cash.

Bicarb. soda is moving off at £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 markets.

Sulphate of ammonia is a shade firmer at £11 @ £11 2s. 6d. per ton, less 2½% for good gray 24@25% in double bags f. o. b. here.

Nitrate of soda, while only meeting with a moderate inquiry on spot, is firm at £8 10s. @ £8 15s. per ton, less 2½% for double bags f. o. b. here, as to quality.

Messina, Sicily.

Nov. 1.

(Special Report of Emil Fog & Sons.)

Brimstone.—Prospects of the acceptance of the contract proposed by the Anglo-Sicilian Company are very poor, not 10% of the mine owners having adhered to it. To intimidate proprietors the Anglo-Sicilian Company began selling large quantities daily reducing prices. The low prices tempted at first speculators, several large steamer cargoes being sold to the United States, notwithstanding the high freights. But the company continuing to sell, a general panic seized those interested. What if the Anglo-Sicilian Company should make good their threat and really wind up the company! Financially, and also politically (disturbances and strikes among the miners), the consequences would be ruinous. A meeting took place at Caltanissetta, and all those present accepted unanimously the new contract as proposed and the company consented to extend the date for

adhesion till the end of November. But the adherents do not yet number 80% of the total producers, which is the minimum fixed by the company. The question is not settled yet and the future is still unsettled; yet prices recovered about 3s. Should the new contract be confirmed prices will certainly rise. Stocks are 20,000 tons less than last year. An increased consumption is expected. We quote, per long ton, f. o. b.: Best unmixed seconds, 74s.; best thirds, 65s. 6d.; refined block sulphur (100%), 78s. 6d.; refined roll sulphur, in casks, 85s. 6d.; sublimed flow-ers (extra pure), in bags, 93s.; sublimed superior, 90s. 6d., and sublimed current, 89s. Freights are 9s. to New York or Philadelphia.

MINING STOCKS.

Complete quotations will be found on pages 627 and 628 of mining stocks listed and dealt in at:

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

New York.

Nov. 23.

Large trading is reported in Amalgamated Copper on curb at \$98¼@96¼, in anticipation of listing the company's securities on the New York Stock Exchange. Anaconda was also largely dealt in on 'change at \$52¼@51, closing around \$52. British Columbia is up on sales to \$20%. Tennessee Copper made a sale at 18¼% and transactions in Union of North Carolina are reported on curb at \$4¼@4¼. Arlington Copper of New Jersey is said to have sold at \$6¼@7. Efforts to interest the public in the Arlington Mine are being made by the company giving an excursion to the property on November 24th.

American Smelting and Refining common shares were very strong in anticipation of an early dividend; quotations on sales rose to \$54¼, but later declined to \$51¼. The preferred shares sold at \$96@97½.

Horn Silver of Utah sold at \$1.25@1.20, and Daly at \$1.15.

Quicksilver preferred of California brought \$8½, and Standard \$3.20.

Colorado sales included Isabella at 72c., Anaconda 52c., Mollie Gibson 26c., Gold Dollar 24@26c., Little Chief 18c., Alamo 12c. and Pharmacist 12c.

Subscriptions to 36,000 shares in the Trinity Copper Company are being diligently solicited in New York at \$25. This company is capitalized at \$6,000,000, which is divided into 240,000 shares of \$25 par value. The property is located in Shasta County, California, and the principal owner and president of the company is Thomas W. Lawson, whom Boston people ought to know pretty well.

Boston.

Nov. 22.

(From Our Special Correspondent.)

Our boom is now in full swing, and we have what Boston people love to call a "broad" market. The engineering has been successful and prices are going up all round. To some extent this is the upward movement which all the exchanges have shown; to a larger degree it is the work of a certain interest. When that party is active, it is well to stand from under.

Naturally the great attraction and the show part of the market were found in the Amalgamated group. Amalgamated itself sold up to \$98, while Boston & Montana was quoted at \$320; Anaconda, \$52; Parrot, \$51½; Arcadian, \$27; Butte & Boston jumped to \$92½ on the announcement of the dividend.

The lake coppers showed a good business, but less inclination to boom. Calumet & Hecla was \$825; Tamarack, \$293½; Osceola, \$79; Wolverine, \$46½@47; Atlantic, \$28. The smaller Lake stocks were in very good demand and showed improvement in prices. Utah Consolidated sold at \$35.

The gold stocks were in fair demand, Centennial-Eureka selling at \$26½, while United States Mining was \$12@12½; Cochiti, \$10; Melones, \$14.

In the general list Montana Coal and Coke sold at \$7½. Dominion Coal was quoted at \$42½; Dominion Steel at \$30; New England Gas and Coke at \$15@15½.

The declaration of a \$5 dividend by the Butte & Boston Company is a "coup" which will doubtless affect a certain class of buyers, though the judicious take the whole business at what it is worth. It is really immaterial what the amount of the dividend might be.

The Adventure Mining Company has called \$1 a share, payable December 20th.

The advertisements of Lawson's new Trinity Copper Company, which appear in all the Boston and New York papers, are attracting attention. People who know something about Shasta County properties in California are wondering at the \$6,000,000 capital stock, and some do not hesitate to say that if two ciphers were knocked off we would be getting nearer to actual values. Nevertheless, as I have said before, people have short memories and there are still many who will follow Lawson's lead and buy his stocks.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing company names, locations, par values, and prices for various dates from Nov. 16 to Nov. 22.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing company names, par values, and prices for various dates from Nov. 15 to Nov. 21.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing company names, par values, and prices.

Total sales, 1,028,646

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, Cal., listing company names, locations, par values, and prices.

CALIFORNIA OIL STOCKS.

Table of California oil stock quotations, listing company names, par values, and prices.

* Producers' Oil Exchange, San Francisco. Total sales, 27,472 shares.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, Pa., listing company names, par values, and prices.

Total shares sold, 36,123. Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia.

SALT LAKE CITY, UTAH.

Table of stock quotations for Salt Lake City, Utah, listing company names, par values, and prices.

TORONTO, ONT.

Table of stock quotations for Toronto, Ont., listing company names, par values, and prices.

Total shares sold, 66,550.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing various companies and their prices from Nov. 10 to Nov. 16. Includes a sub-section for 'Colorado Springs Mining Stock Exchange' at the bottom.

DENVER, COLO.

Table of stock quotations for Denver, Colo., listing various companies and their prices from Nov. 10 to Nov. 16.

Official Quotations Denver Stock Exchange. Total sales, 269,900 shares.

SPOKANE, WASH.

Week Nov. 15.

Table of stock quotations for Spokane, Wash., listing various companies and their prices for the week of Nov. 15.

PARIS.

Oct. 31.

Table of stock quotations for Paris, listing various companies, countries, products, and prices as of Oct. 31.

LONDON

Nov 9

Table of stock quotations for London, listing various companies, countries, authorized capital, and prices as of Nov 9.

MONTREAL, CANADA.

Table of stock quotations for Montreal, Canada, listing various companies and their prices for the week of Nov. 19.

MEXICO.

Nov. 9.

Table of stock quotations for Mexico, listing various companies, shares, and prices for Nov. 9.

DIVIDENDS.

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

Table with 12 columns: Number, Name and Location of Company, Authorized Capital Stock, Shares Issued (No., Par Val), Dividends (Paid, Total to Date, Latest Date, Amt.), Number, Name and Location of Company, Authorized Capital Stock, Shares Issued (No., Par Val), Dividends (Paid, Total to Date, Latest Date, Amt.).

COAL, IRON AND OTHER COMPANIES.

Table with 12 columns: Number, Name and Location of Company, Authorized Capital Stock, Shares Issued (No., Par Val), Dividends (Paid, Total to Date, Latest Date, Amt.), Number, Name and Location of Company, Authorized Capital Stock, Shares Issued (No., Par Val), Dividends (Paid, Total to Date, Latest Date, Amt.).

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

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

Table listing various chemicals, minerals, and rare elements with their current wholesale prices. The table is organized into columns for different categories such as Abrasives, Borax, Calcium, Magnesium, Silver, and others. Each entry includes the material name, its measurement unit, and the price per unit.

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

Table listing rare elements such as Barium, Beryllium, Boron, Cadmium, Cerium, Chromium, Cobalt, Didymium, Erbium, Germanium, Glucium, Indium, Iridium, Lanthanum, Lithium, Magnesium, Molybdenum, Niobium, Osmium, Palladium, Potassium, Rhodium, Rutherfordium, Ruthenium, Selenium, Silicon, Sodium, Strontium, Tantalum, Tellurium, Thallium, Thorium, Titanium, Uranium, Vanadium, and Zirconium, along with their prices.

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 Nov. 21. 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.