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The reputation of Leadville as a silver mining camp now seems in a fair way to be eclipsed by the development of its gold deposits. The extraordinary showing made on the Little Johnny gold property had attracted much attention, but it has been believed by many that the claim was simply a pocket which was not likely to show any extension beyond narrow limits. The telegram from our Leadville correspondent published in our news columns reports a most important discovery of gold ore in the Triumph shaft, on a claim adjoining the Little Johnny on the south. The ore is similar to that of the latter claim, but it is still uncertain whether the new find is a continuation of the older one, or a separate deposit. In any event the discovery is an important one and will greatly stimulate exploration. We congratulate our Leadville friends on the new discovery, and hope that the later career of the camp as a gold-producer will be quite as successful as its earlier one in silver.

AMERICAN ARMOR PLATES FOR RUSSIA.

It is a matter for congratulation that our American steel works have shown their ability to compete, without protection, with the European manufacturers. The Bethlehem Iron Company advises us that a bid which it had made to supply the Russian Government with heavy armor plate had been accepted. The contract is for the plates which will form the side armor of two new battleships—the "Petropavlosk" and the "Sevastopol"—and will require about 1,200 tons of plates 16 inches thick. As the acceptance of the bid was by cable, fuller details of the contract cannot be given until advices by mail are received.

The award has doubtless been influenced by the results obtained in tests of Bethlehem plates here and elsewhere. The Bethlehem Iron Company is now beginning to realize some of the results of its enterprise in establishing its armor-plate plant. It is a cause of national congratulation that one of our makers should have been able to secure such a contract in competition with the steelmakers of England, France and Germany, including such establishments as those of Krupp, of the Schneider Company at Creusot, of Cammells and others in England, which have had years of experience in the manufacture. We believe that this will not be the last contract of the kind coming to this country; and hope that it will be only the first of a long line of profitable orders.

GOLD EXPORTS AND CURRENCY REFORM.

Our financial column last week and to-day shows that gold exports on a considerable scale have been resumed at a season of the year when such shipments are not usual. Last week these exports were \$3,500,000, and while the amount this week is somewhat less, there seems to be no doubt that they will continue, and that the movement which marked the closing months of 1892 and prepared the way for the panic of 1893 will be substantially repeated. The gold reserve of the Treasury, which two weeks ago had been built up to \$110,560,000 by the proceeds of the bond issue, fell in one week to \$104,888,000, and to-day stands at \$93,210,400, showing a loss of \$17,349,600 in two weeks; that is, almost one-third of the gold nominally received for the bonds, and over one-third of the actual net gain of gold by the issue, have already gone, and there is no sign whatever that the outflow will be checked.

Under ordinary commercial conditions there is no apparent reason why gold should go out at the present time. In fact the so-called balance of trade is largely in our favor. The Treasury returns for the eleven months of the present year to November 30th show that our imports and exports have been as follows:

Table showing trade statistics: Merchandise exports \$740,220,285, Merchandise imports 610,215,499, Excess of exports \$130,004,786, Silver exports \$43,348,728, Silver imports 8,979,906, Total excess of exports \$164,373,608.

The silver exported, as we have heretofore explained, must be considered in the light of merchandise; it is sent abroad as such and sold at the market price. Our settlements with the world must be made in gold. But the figures above do not by any means express the whole account.

In addition to merchandise, our gold exports and imports for the eleven months have been as follows:

Table showing gold trade: Gold exports \$92,009,321, Gold imports 20,213,610, Excess of exports \$71,795,711, Add merchandise excess as above 164,373,608, Total balance \$236,169,319.

Why is it, then, that, with an apparent balance in our favor of over \$233,000,000, we should still be called upon for gold?

In a recent article (October 20th, 1894) we showed some of the reasons why we are called upon for a large amount of the excess in trade balance, and explained the payments required for interest on investments.

freight charges, money spent by travelers abroad, and other items. At that time our calculation was that these payments for the current year had been substantially met. We see no reason now to doubt the correctness of that estimate, and in the ordinary course of business the gold movement at the present time should be to, and not from, this country. That it is not so, is due to the withdrawal of foreign investments made through the sale of American securities held abroad, and the recall of the balances kept in New York and elsewhere by foreign bankers. These latter often amount to a very large sum, since there are usually better opportunities for investment and a better rate of interest here than abroad. At present, however, the great surplus of money held here seeking employment has forced down the interest rate on loans of all kinds to the lowest point on record and as low as European rates.

The main cause for the withdrawal of capital, however, is not the low rate of interest, but the loss of confidence due to the condition of our currency. There is a general impression, both abroad and at home, that it will be impossible for the government to maintain its credit, so far as the currency is concerned, much longer unless the conditions are materially changed. The whole enormous mass of our circulating notes is sustained by the gold reserve in the Treasury; and as long as this reserve shows daily diminution, as at present, it will be impossible to maintain confidence. The issue of bonds for gold, unavoidable as it was, is simply a temporary expedient, the absolute uselessness of which is shown by the figures given at the opening of this article.

Under these circumstances there appears to be but one rational course to pursue. The foundation of our credit is not excelled in any country in the world. No one doubts the ability of the United States to pay, and in the markets of the world its interest-bearing bonds command as high a premium as those of any nation. The present trouble and impairment of confidence are due solely to the excessive amount of floating debt or demand notes outstanding. The plain and simple remedy is to fund that floating debt as rapidly as possible. The offer might be of long 3 per cent. bonds for currency to any amount which may be necessary to withdraw the superfluous notes from circulation. Gold would then come to the government through the custom-house receipts. The funding of the demand notes would remove the apprehensions now felt and would place the Treasury in a strong position. This, it seems to us, is the plain and practical course open, and until it is adopted the discussion of other measures will be useless.

An evidence of the kind of currency most abundant, or redundant, is found in the receipts at the New York Custom House, where a very large proportion of the total customs revenue is paid in. Naturally the payments made would be in that form of currency which was most convenient to the banks, and which they had the least desire to keep. In the year 1890 gold formed 91.8 per cent. of these receipts, but in 1891 the proportion of gold fell to 12.8, and in 1892 to 12.1 per cent. of the total, the place of coin being largely taken by the treasury notes issued under the Sherman act. For the year 1893 the payments were made, about 20 per cent. in gold coin and certificates, 25 per cent. in silver certificates, 32 per cent. in legal tenders, and 23 per cent. in Sherman act notes. For the eleven months of the current year the proportions have shown a marked change, being 52 per cent. in silver certificates, 30 per cent. in legal tender, and 14 per cent. in treasury notes, while the payments in gold have been less than 3 per cent. and 1 per cent. in silver.

These figures tell their own story. Until the redundant circulating notes are removed the Treasury cannot expect to increase its gold reserve from ordinary payments, while it must face a constant depletion of that reserve by the presentation of its demand notes for payment in coin. That this situation cannot continue very long is so clear that further comment is useless.

We showed briefly in our last issue that the Carlisle bill now before Congress is, if unaccompanied by other legislation, simply an inflation measure. Whatever its merits may be as a banking measure, it is useless to discuss them until some action is taken to meet the present emergency. The withdrawal of so much of the currency as is redundant would restore confidence, and this is the first and most pressing need. When provision has been made for this, the full substitution of bank notes for government notes will be in order.

#### THE UNITED STATES GEOLOGICAL SURVEY.

The readers of the "Engineering and Mining Journal" well know that this paper has always maintained the importance to the mineral industry of an efficient geological survey of the several States and territories, and has regarded with friendly and appreciative interest whatever good work has been done in this direction.

Several of the State surveys have, with quite insignificant means, accomplished very excellent results, less pretention, it is true, but more useful and infinitely less costly in proportion to work actually done than that of the United States Geological Survey. These facts have very naturally

attracted attention to the work, the management, and the general policy of the Survey, with the result of making more general the knowledge that its shortcomings and abuses have been in a large measure due to obvious lack of intelligent plan and control in the work undertaken, and to a very general inefficiency in its execution. Politics and "pulls" took the place of geological knowledge and honest work, and the Survey became much more distinguished for its skill in "lobbying" for enormous appropriations from Congress than for the quality or economy of the work it did. The favorable votes of Congressmen were secured by giving positions on the Survey to their friends or relatives, who were frequently incompetent to do efficient work and were sometimes positive disgraces to the Survey. For the same reason, work wholly foreign to the proper functions and scope of a geological survey were undertaken at heavy expense, because it was of interest or pecuniary benefit to legislators whose support was necessary to secure the very large appropriations the Survey asked for. So expensive and inefficient did it become, and so notorious were the scandals connected with it, that a few years ago it narrowly escaped abolishment, and that only when it was tacitly understood that there should be an entire change and reform in its administration.

About a year ago the change was decided upon and in June last it was announced that Mr. Charles D. Walcott had been appointed director. The "Engineering and Mining Journal," July 21st, thus referred to this fact and expressed its hopes and expectations of greatly improved results, while pointing out, in friendly admonition, some of the sources of inefficiency and complaint in the previous history of the Survey:

"It was natural that ambitious and enthusiastic men should magnify the importance of the subjects they were interested in, and thus gradually the field of labor of the United States Geological Survey became enlarged by researches into various departments of science and industry, some of which were but slightly and others not at all connected with its legitimate functions.

"It became absolutely necessary that a reorganization of the Survey be effected, that its work be systemized and confined to the legitimate functions of a geological survey; and that the excrescences that had grown up upon it be lopped off without regard to personal or political 'pulls.' Mr. Walcott, who has just been appointed director, has certainly many and probably all of the qualifications required to bring about this effective reorganization, and so systemize and limit the operation of the Survey as to enable it to successfully accomplish the great and useful work it was intended to perform, and which it is capable of doing. . . . It is indeed infinitely more important and more useful, both to the Survey and to the public, that the strictly geological work should be thoroughly well done and made available promptly, than that the publications of the Survey should give a smattering of information in every field of human knowledge.

"The resources of the Survey should not be scattered in doing such inappropriate and unnecessary work as preparing and publishing treatises on Comstock mining and miners; on the old lead smelting methods at Leadville; the technical condition of the steel industry; copper smelting; industrial chemistry as given in many of the papers of the division of chemistry and physics; salt manufacture; and the numerous technical and commercial articles on the production, manufacturing and marketing of the various minerals and their products given under the erroneous title 'The Mineral Resources of the United States.'

"It is quite safe to say that such investigations of industrial and commercial questions are not proper subjects for the work of a geological survey; and where equally good—not to say better—information on the same subjects is readily obtainable in the publications of the specialist technical periodicals, in the transactions of the scientific societies and in the treatises of experts and professional men, the preparation and publication of such material by the Geological Survey is not merely inappropriate—it is a waste of the public money.

"The diversion of the work of the Survey to the investigation of the possible irrigation of the arid lands of the West, which, as in recent years absorbed so much of its means, has also been very frequently and severely criticised, and its wisdom may well be questioned.

At that time we had reason, in the statements of Director Walcott and of others, to believe that the duties of the Survey would be restricted to the proper work of a geological survey, and on this assumption we could expect vastly better work and greater economy in expenditures. The only authoritative public statement of the policy of the new director since made public is contained in the appropriations asked for in the present Congress and in an address Mr. Walcott made before the Colorado Scientific Society in Denver, Col., September 17th, and which was published the next day in the Denver "Republican." In this official statement we have evidence that the director has been "stampeded" by the "boomers" of the Survey, to use a Western expression, and instead of restricting the work to the legitimate functions of a geological survey he has not only adopted all the old excrescences, but has entered upon several new fields of work which have no proper place in the Survey, and which leave no stopping point short of the Geological Survey absorbing the duties of the Coast and Geodetic Survey, the United States Land Office, the Agricultural Department, and in fact any other duty which its officers or their friends may be interested, financially, scientifically or politically, in having investigated at the expense of the taxpayers of the country.

Take the following official program, does it leave out any field of human knowledge or investigation? Under it the Survey might absorb and perform all the work of the civil and mining engineers, the metallurgists, the industrial chemists, the teachers in our schools, etc., and if it can get the appropriations, it may eventually absorb the work of all these professions. It is indeed now one of the most objectionable practices in the Survey that it allows its members, who are receiving from the govern-

ment salaries for their full services, to continue their private practice and use their official positions to make professional fees:

Director Walcott says:

"There is one point that should always be borne in mind in considering the scope of the work, and that is that the Geological Survey is a bureau of research. Its work is the discovery of unknown facts and principles, and the scientific co-ordination of these and all known facts and inductions within the scope of its work, in such a form that they shall subserve both the use of the government and the people; the latter to include not only the farmer, prospector, miner, owner of lands, investor, mining and civil engineer, but the most highly trained students, teachers and specialists—in other words, the practical and theoretical man."

The following extracts from the same official program show how easy it is to lead up to the absorption of a new function. Under this policy there is no field of human investigation on the surface of the earth, nothing in the depths below nor in the heavens above, which may not come within the scope of our United States Geological Survey, if only Congress will make sufficient appropriations:

"In the great semi-arid region of the interior the maps were requested to aid in the development of their resources in artesian water and the application of drainage waters to irrigation. Severe criticism of the Survey has been made on account of the extent of the topographic surveys in the semi-arid region, but, when it is considered that the Geological Survey is a national institution, it is evident that the great interior has as just a claim for consideration as the mining regions of the mountain areas of the eastern and western sides of the continent. If water is their principal resource, then it should receive due attention in making the topographic map, along with the areas that possess mineral wealth in coal, metals, etc."

"The direction of the organic law of the Survey that the director shall have charge of the examination of the mineral resources and products of the 'National Domain' has been interpreted to mean a geological examination of the mineral resources and a statistical examination of the products of those mineral resources."

"The areal geologic maps of the area south of the great glaciated area in the central and eastern portions of the United States are practically soil maps, as the soils were formed by the decomposition of the rocks in situ. Within the glaciated area the geologic maps show the distribution of gravels, clays, etc., and they are of value to the students of the distribution of soils. The most direct bearing of the work is upon the question of artesian water supply. This brings us to the problem of the general water supply of the country."

"During the last session of Congress an appropriation was made for gauging the streams and determining the water supply of the United States, under the direction of the Geological Survey, including the investigation of underground currents and artesian wells in the arid and semi arid sections. The appropriation was too small for extended work, but it is hoped that it is a beginning of a thorough investigation of the water supply."

"Another field of work entered upon by the Survey, and one of great interest to farmers of the interior, and that is the geology of highways. The difficult question in the building of highways is the choice of materials, and it is in this special department that it is proposed that the Geological Survey shall give assistance. This can be done by establishing a laboratory for testing all road materials, including the quality of clays to be used in the manufacture of bricks for pavement where hard rocks are not available for macadamizing."

The appropriations called for under the old administration, and made in the last session of Congress (in addition to which it has received large amounts from the State legislatures), as compared with those asked for next year, and now before Congress in the "estimates" of the Treasury Department, are as follows:

	1894.	1895.
For salaries and general expenses, etc., including \$15,000 for preparing report of mineral resources.....	\$421,600	\$422,600
For salary of director and clerks, etc.....	31,390	33,390
For salary of executive officer.....	3,000	?
Rent.....	10,000	10,000
Engraving and printing monographs.....	35,000	35,000
In deficiency bill.....	1,000	?
	\$501,990	?
Stationery (an indefinite part of \$52,500).....	?	?
Land Office survey.....	?	\$75,000

From the foregoing official data it appears that the new administration of the Geological Survey not only proposes continuing the work which nearly all American engineers and geologists consider to be wholly foreign to its legitimate functions, but it proposes extending this field to take in many new departments. The enormous appropriation must, of course, go on growing as the new fields of work are organized.

The Survey cost the United States Government (or the taxpayers) more than half a million dollars this year, and the appropriations called for for next year exceed those of last. There is an effort made to place the Land Office survey under the Geological Survey with a new appropriation of \$75,000 for the work (page 249 of Estimates book).

The particular work of the Survey, which has received perhaps the most general criticism for its inaccuracy, is the topographical surveying. It would seem therefore especially out of place to put the land surveys under the Geological Survey.

We invite correspondence upon these important subjects, and desire to receive the views of geologists and engineers on the following questions:

1. What are the proper functions of a geological survey?
2. Should the United States Geological Survey be charged with the surveys of the United States Land Office?
3. Should it make the topographical or geodetic surveys?
4. Should the Geographical Survey be "a bureau of research," such as described above by its director?
5. Should it enter on surveys and an investigation of the irrigation question, the gauging of streams, etc.?

6. Should it spend the public money in collecting and publishing technical reports on questions of mining, metallurgy and statistics?

7. Should it undertake to investigate and advise as to the building of highways; the materials for brickmaking; the testing of materials for roadmaking, etc.?

8. Should the members of the Survey be allowed to carry on private practice as engineers, chemists, etc., and receive fees while drawing government salaries?

The manner in which the Survey gets and spends its money, and the quality and cost of the work it does, are matters which call for attention hereafter. We have great pleasure in saying, however, that Director Walcott has introduced many administrative reforms in the Survey, and that there have always been some able and industrious geologists upon its staff who are capable of doing, and have done, good work in the legitimate field of a geological survey.

#### NEW PUBLICATIONS.

NOTES ON METALLURGICAL ANALYSIS. By N. W. Lord, E. M. Published by the author. Columbus, O. Pages 101. Price \$1.25.

This valuable little textbook is a credit to its author, Professor Lord, in its concise treatment of the subjects, its eminent practicability and the excellent arrangement. A fault too often found in textbooks for students, and one which has happily been avoided in this excellent work, is that the methods which the students are directed to use are the older ones which, while sure, are frequently so extremely slow as to be altogether impractical in industrial works. Again, more than one method is seldom given other than by mere mention, so the student is in ignorance of it or any special advantage which may be obtained by its use under certain conditions. Professor Lord avoids these faults by giving fully, yet most concisely, the standard method used industrially, and further describing as much as need be any useful modification of it: and in addition to this in giving the various references where full information can be obtained.

It is unnecessary to enter into a detailed description of the manner in which the subject is treated. Every word means something, and the fact that the ground has been so thoroughly covered in 100 pages is in itself sufficient testimony as to the manner of its preparation. The work deserves the highest commendation, and will be found useful alike to the student and the practicing chemist.

THE ORE DEPOSITS OF THE UNITED STATES. By James F. Kemp, A. B., E. M., Professor of Geology in the School of Mines, Columbia College. Second edition. Revised and enlarged. New York and London: The Scientific Publishing Company. Pages 343; illustrated. Price \$4.

The exhaustion of the first edition of this excellent work in a little over a year, and the prompt appearance of a second edition, show that it supplied a real want in the literature of this country.

The second edition has been revised and considerably enlarged, containing some 50 pages of new matter as well as a number of additional illustrations, the whole being brought down to date.

The introductory portion of the work, consisting of 70 pages and giving a general account of the nature and classification of ore deposits, is undoubtedly the best succinct presentation of the subject in the English language and must be of especial value for purposes of instruction in the various colleges and technical schools where the book is used. The most notable additions to this portion of the work in the second edition consist of a résumé of Posepny's recent work on the origin of the deposits and an account of the recent work of Vogt and others, on the action of the magmatic concentration of certain constituents of igneous rocks in giving rise to valuable deposits of ore.

The body of the work is made up of brief descriptions of the ore deposits of all parts of the United States, and Professor Kemp in his cheerful way, considering Canada already as good as annexed, has included descriptions of certain of the more important ore deposits of the Dominion, especially those of the great nickel deposits of the Sudbury District. These descriptions, though in most cases necessarily brief, are accompanied by such abundant references to the literature of the subject that any one interested in any particular class of deposits, or even in any particular deposit, may, if he wish to continue his studies, at once ascertain where the more important papers bearing on these are to be found. The book thus not only serves the purpose of beginners, but is of the greatest value to more advanced workers as well.

The most substantial additions to the descriptive portion of the work are in connection with the treatment of iron ores, of the geology of the Sierras and of nickel and cobalt. In this case of the iron ores a description of the extensive deposits of bog and lake ores in the Three Rivers district of the Province of Quebec is added. These deposits, have been worked continuously since the times of the French régime having, in recent years, been smelted in considerable quantity. The specular ores of Missouri are also described, and a more extended treatment accorded to the wonderful deposits of the Mesabi district, from which important shipments had not been made when the first edition of the work appeared.

Professor Kemp has also added a chapter on the various nickel deposits of South America, dealing especially with those of the Sudbury District, now the largest producers of nickel in the world. After a careful examination of these Sudbury deposits, Professor Kemp states his belief that they have resulted, as held by Vogt, from the concentration of the pyrrhotite, which is one of the constituents of the dioritic rock in which they occur, which concentration took place during the cooling of the fused magma. The Gap mine in Lancaster County, Pa., as pointed out, belongs to the same class of deposits. Much new material has also been incorporated presenting the results of recent work and investigation in connection with various gold ores, bauxite deposits and zinc ores.

In conclusion it may be said that the work is an excellent one and will prove in the future, as in the past, to be of the greatest service not only in our colleges and technical schools, but to all who are interested in the mineral resources and development of the country.

## BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review on another page of the Journal.

- Western Australia: Blue Book for the Year 1893.* Perth, Western Australia; Government Printer. Pages, 330.
- New Zealand: Mines Statement; 1894.* Hon. A. J. Cadman, Minister of Mines. Wellington, New Zealand; Government Printer. Pages, 28.
- The Armor-Plate Question.* By Capt. W. H. Jaques. New York; reprinted from the "Engineering Magazine." Pamphlet, pages 28; illustrated.
- Western Australian Year-Book for 1892-1893.* Malcolm A. C. Fraser, Registrar-General. Perth, Western Australia; Government Printer. Pages, 275; with map.
- Introduction to Chemical Analysis for Beginners.* From the Sixth German Edition of Prof. Dr. Fr. Rudorff. By Chas. B. Gibson and F. Menzel. Chicago, Ill.; The W. T. Keener Company. Pages 118.
- Western Australia in 1893.* By Francis Hart. Perth, Western Australia, and London, England; Government Printers. Pages, 276; illustrated by maps of the Colony and numerous photogravures and sketches.
- Business Forms, Customs and Accounts, for Schools and Colleges. Also book of blank forms.* By Seymour Eaton. Published by the author, and sold by the American Book Company of New York, Cincinnati and Chicago. Pages, 111. Price complete, \$1.50.
- Statistique Generale des Richesses Minerales et Metallurgiques de la France et des Principaux Etats de l'Europe: Consistance des Principales Mines et Usines; 1894.* Par E. de Villars. Paris, France; Vve. Ch. Dunod & P. Vicq. Pages, 251.

## CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested. Letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

## The Increased Flow of Water in Mines at Night.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I would like to call the attention of your readers to some singular facts that have fallen under my notice in past years, hoping that they may be confirmed by the experience of others.

The caves that frequently take place in the old and abandoned parts of mines occur more frequently about midnight than at any other time. Of course I do not refer to caves from the roof of a level wherein a trainman may be pushing his car, and thus cause some little jar, or the caves which sometimes follow the blasting throughout the mine.

Another peculiar fact is the increased flow of water to a mining pump at night, making it necessary to run the pump somewhat faster.

Undoubtedly both of these effects are caused by the position of the sun on the other side of the globe, thus increasing to a slight degree the force of gravity.

I have somewhere read of the observed increase of power in a water wheel at night—over daytime—which confirms the proof of cause.

Of course when the sun and moon are both on the other side of us, the "pull" would be much greater, and it would be interesting to have some careful records kept where steady pumping is done, so as to compare facts and theory.

B. H. LOCKE.

DENVER, Dec. 1, 1894.

## Circulation, Gold and Prices.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The French have a proverb, "From the collision of ideas light springs." Referring to your number of September 29th and your Denver correspondence, your antagonists seem to persist that the "bad times" are due to a want of "money." In 1868-69 and the following year things in the United States were "booming," and the whole circulating medium was, say, \$400,000,000 greenbacks, of which a goodly quantity was in the United States Treasury, deposited there by the national banks, besides, say, \$350,000,000 national bank notes. I do not pretend to be exact as to the figures, but say 800 million in all, or less than \$20 per capita. To-day, by your issue of October 6th, there is in circulation \$1,655,038,982, or say \$25 per capita, and business is dead. Now as to the price of gold causing a decline in prices: At the time above mentioned the country was on an inflated paper basis, so we cannot take that time as a standard for labor. But to go back before the war, say 1850, when there was a gold inflation, labor of all kinds was paid much less than it is paid now. If gold is dearer, why should not labor be cheaper? As to the situation of labor and capital: In 1850 about 7% on bond and mortgage was what the capitalist got for his money. To-day he gets just half, while labor gets double. So much for the oppression of labor by capital.

CICERO BROWN.

HAVRE, France, Oct. 30, 1894.

## The Mineral Industry, Vol. II, 1894.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: . . . I wish . . . to express my high appreciation of . . . the "Mineral Industry," which is the standard work of its class here as well as in the United States. I only wish that the financial department of a United States Consulate were so arranged as to permit a consular officer to fully indulge his appetite for works of that class. . . .

FRANK H. MASON,

United States Consul-General.

FRANKFORT-ON-THE-MAIN, Germany, Nov. 27, 1894.

## FROM "THE BLACK DIAMOND," CHICAGO, ILL.

. . . It deals in the most ample and copious manner with the mining statistics, technology and trade of the United States and other countries from the earliest times to the end of 1893, and as such is a most valuable compendium of useful knowledge. The greatest care has been exercised in its compilation, and an enormous amount of work has been entailed thereby. Nothing more can be said than that it is a work which should be in the possession of every scientific man, practical or theoretical.

## THE NEW MINING LAW OF NEW YORK.—II.

Specialy Written for the Engineering and Mining Journal by E. W. Raymond.

Last week I gave in these columns an outline of the recent legislation in this State concerning mineral deposits upon public and private lands, showing that by chapter 745 of the laws of 1894 all previously existing safeguards of the rights of landowners had been swept away, while the property of the State had been recklessly granted without remuneration to mining speculators. It is my present purpose to indicate who is responsible for this outrage and folly, and what should be done about it.

1. Chapter 745 was originally introduced in the Senate, January 9, 1894, by Mr. Harvey J. Donaldson, of Ballston Spa, representing the 18th senatorial district, which comprises the counties of Saratoga, Schenectady, Montgomery, Fulton and Hamilton. The latter county, in particular, includes a very large area of the State lands in the Adirondack region, and its senator may be presumed to know something about the interests of the State in that region, and the private interests likely to affect them. Moreover, Mr. Donaldson was a member of the Senate Committee on General Laws, to which the bill he introduced was immediately referred. That committee, having this bill before it, reported favorably another bill (Chapter 317, laws of 1894), which was passed in April last, to take effect October 1, 1894, and now constitutes (so far as it was not abrogated before it went into effect at all) Article XI. of Chapter XI. of the General Laws. As I have elsewhere shown, this act, while open to criticism on grounds of general policy and in some of its details, still provides important safeguards for private rights, and requires a royalty of 2% on the product of mines (other than those of gold or silver) on the public land, while it gives to the Forest Commission and the Commissioners of the General Land Office a preliminary control over the operations of locators, which might be so exerted as to protect both the State and its citizens against wanton spoliation.

2. It is incumbent on all the members of the Senate Committee on General Laws to explain how it came to report with unanimous approval not only Chapter 317, but also Chapter 745, which abrogates its essential provisions, and why the earlier, less mischievous act was passed to take effect October 1st, and the later, more mischievous one, to take effect immediately. It is evident from the record that Mr. Donaldson's bill, as introduced in January, had been considerably changed before it was reported, with amendments and a new title, in March. But the latter report officially declared to have been unanimous, was not objected to by Mr. Donaldson, who, moreover, moved and voted for the bill on its final passage. He is, therefore, responsible for the bill as passed; and explanations from him are clearly in order, concerning the motives which influenced him to advocate it. This does not, however, by any means release from responsibility the other members of the committee; and I therefore give the names of all of them, viz.: Charles W. Stapleton, Morrisville; Cuthbert W. Pound, Lockport; Frederick D. Kilburn, Malone; Wm. H. Reynolds, Brooklyn; Thomas C. O'Sullivan, New York; Joseph C. Wolff, New York, and Charles L. Gray, New York. It is but fair to add that the bill was twice passed by the Senate, first on March 28th, and again, as amended in a single particular by the Assembly, on April 26th. On the first occasion Senator Reynolds, of the above committee, voted against it, without giving, so far as I can discover, his reasons. He may therefore have been absent from the committee, or opposed to the bill, when it was there considered. Of the other members of the committee, Messrs. Stapleton, Pound and Kilburn voted for the bill. On the second occasion the amended bill was passed unanimously, on motion of Mr. Donaldson, and Messrs. Donaldson, Stapleton, Pound, Kilburn, O'Sullivan and Wolff were recorded in its favor, Messrs. Reynolds and Gray being absent or not voting.

3. Less directly responsible, but still responsible, are the members of the Senate who voted for the bill; and behind them in diminishing degrees of blameworthiness come the absentees, whose neglect of duty permitted its passage. When a single vigorous protest might have defeated it; the members of Assembly, who carelessly accepted it from the other house and returned it with a single amendment (of which I shall speak presently), and finally, the Governor, who, after holding the bill from April 27th to May 22d, signed it at last, apparently without noticing its extraordinary character.

I am not concerned to distribute the degrees of censure justly deserved by all these persons. Wholesale indictments have little effect. It is only when the chief responsibility can be brought home to a small number of offenders, or, better still, to one, that the arraignment is effective, upon either the accused or the public. In this case, it seems clear that the careless approval, by Senate, Assembly and Executive, of this pernicious bill was primarily due to the favorable report of it from the Senate Committee, the absence of outspoken protest from any member of that committee, and, above all, to the remarks of Senator Stapleton, which I quote from the stenographer's report:

"This bill has been before the Committee on General Laws for nearly two months. The only change this bill makes in the existing law is entirely for the benefit of the landowner. It simply provides that locators and prospectors may enter upon lands and stake out claims, upon doing which they must file with the Secretary of State a certificate of location. Also that an order may be procured from the county court or Supreme Court compelling them to file an undertaking to pay any damages that may arise or accrue to the landowner, or deposit a sum of money for that purpose.

"This bill also differs in one other respect from the existing law. As the law now stands there is nothing to prevent one man from locating on top of another's claim. This proposed law prevents that, and gives the right to the first locator. These are the only changes from the original law.

"The committee were unanimously of the opinion that the law ought to pass for the benefit of people who desire to locate mines in this State.

"I withdraw my request to be excused from voting, and vote aye."

These remarks, made during the vote, on the parliamentary pretext of a request to be excused from voting, constituted the whole of the debate on the bill. It is not surprising that, accepting such uncontradicted assurances from a leading member of a leading committee, the Senate indolently voted for the bill, or that, thus indorsed, it passed easily through the Assembly, and escaped the critical scrutiny of the Governor. Yet every statement made in that speech concerning the character of the bill was untrue. The bill makes no change "for the benefit of the landowner"; it does not provide "that locators may enter upon lands and

stake out claims before filing a certificate of location"; it does not provide that "an order may be procured" compelling locators to give security for damages. The previously existing law did not leave it possible for one man to locate "on top of another's claim." Finally, the changes specified (and misrepresented) by Senator Stapleton are not the only ones made in the existing law. He suppressed mention of the radical changes I have pointed out, of which I need recall here but three: The abolition of all royalty to the State; the unconditional grant of the right of entry on private lands without any preliminary legal proceedings whatever, and the practical revocation of the authority and control of both the Forest Commission and the Commissioners of the Land Office.

The circumstances call very loudly for an explanation from Mr. Charles W. Stapleton.

4. Inquiry is also in order as to the private schemes benefited by this bill. It would be interesting in the first place to know the history of the solitary amendment made in the Assembly, which consisted in the insertion in two places of the simple phrase "except garnets," the effect of which was to exempt this one mineral from the operation of the law. As garnets are not metallic ores, they belong, under this act, as under all preceding ones, by implication, at least, to the landowner. This amendment, therefore, affects only the garnet deposits on State lands. What was its purpose and what is its effect, I will not now pause to inquire. But light may perhaps be shed on both these questions by further information as to its source.

But more important would be the inquiry concerning such mines as are not exempted, but included by the terms of this act. To assist this inquiry I shall furnish next week a list of all the notices of discovery filed with the Secretary of State from February 23d to November 9th, 1894, giving the names of the alleged "discoverers," locality of the alleged "mines," and the metals claimed.

5. If, in any of these cases, it should appear that entry upon private lands has been claimed or exercised without the consent of the landowner, it is highly desirable that a case should be made up at once, to test the constitutionality of Chapter 745. Personally, I think it is unconstitutional, in granting an easement upon private property, for uses not public and without due process of law; and in this opinion I am supported by eminent lawyers to whom I have submitted the question. It is probable, therefore, that a private landowner, whose rights have been invaded under Chapter 745, could, by contesting this point, not only successfully protect himself, but also deliver from actual or threatened injustice all the landowners of the State.

6. The above remedy, however, would be effective only as regards private lands. The squandering of the mineral resources of the public lands of the State, contemplated by Chapter 745, is not unconstitutional, but simply wicked and foolish. To meet this mischief, a bill should be passed as soon as possible, by the next Legislature, repealing Chapter 745 of the laws of 1894. This would not leave to the State of New York a rational, symmetrical and complete mining code; but it would do away with the immediate and worst evil of the existing law, and would restore to the Commissioners of the Land Office the discretionary power conferred by Chapter 317 of the same year, in the exercise of which they could at least prevent outrageous invasions of private rights, and protect to some degree the property of the State. A well-considered and comprehensive statute, covering the whole subject of mining rights, would still be desirable; but it would not be wise to wait until such legislation could be perfected before removing the actual wrong and peril involved in Chapter 745.

#### THE RAINY LAKE GOLD DISTRICT

Specially Written for the Engineering and Mining Journal.

The newest gold field of the Province of Ontario, that of the Rainy Lake district, was the subject of a mineralogical examination during the past summer by the Bureau of Mines. Dr. A. P. Coleman, mineralogist to the Bureau, had charge of the work of exploration, and the party under his guidance was in the field for nearly three months. Rainy Lake district, as is well known, is in the far western portion of the province, and the gold-bearing area extends north from the Minnesota boundary to a distance yet undetermined, but certainly beyond the line of the Canadian Pacific Railway, and in all probability many miles north of the track. A result of the exploration has been to prove that in the district south of the C. P. R., an area of at least 200 miles long and over 50 wide, shows free gold at short intervals in greater or smaller proportions. The geology of the region was studied and carefully mapped by Andrew C. Lawson, of the Dominion Geological Survey, in 1885, 1886 and 1887, and the results were published in the Survey's report for the last mentioned year. No topographical survey of the country has ever been made, and Lawson's excellent map remains the only one for the guidance of prospectors and explorers. As it shows a portion of the gold-bearing area which runs down into the State of Minnesota it is in demand by American as well as Canadian gold seekers. The mineral features of the district received comparatively little attention from Lawson, and indeed the existence of gold seems to have been quite unknown to him, though from the identity of the so-called "Keewatin" rocks of the region with those in the neighborhood of Lake of the Woods, in which gold was found, he inferred the probable presence of the metal. The first discoveries were, however, made in the fall of 1893. Dr. Coleman's examination of the district being the first scientific one from a mineralogical point of view, the results of his work are important, as throwing light on the probable value and permanence of this latest addition to the gold fields of the continent.

The whole region consists of two great groups of rocks—Laurentian and Huronian. A feature of geological interest and practical importance to the miner is the fact that the gneissoid Laurentian rocks, not generally regarded as eruptive, come up through the green Huronian schists, which at one time probably formed a great sheet, covering all the rocks beneath. These Laurentian bosses have thus enfolded between them the schists, and, as a consequence, the latter are found throughout the whole of the district in a position nearly perpendicular. It is in the schists, hornblende, chloritic and other, that the gold is principally found in quartz veins, which, in the majority of cases, are bedded veins. True fissure veins are rare, though by no means unknown. The district, indeed, so far as discovery and development have yet revealed, seem to

present, as a characteristic feature, the occurrence of gold in bedded, not fissure, veins. What bearing this will have on the value of the field it is, of course, impossible to say: but the results of experience in other parts of the world has been to show that, as a rule, bedded veins do not present so persistent and certain bodies of ore as fissure veins.

In the vicinity of Shoal Lake is situated the Wiggins property, on which are several true fissure veins which can be traced for a mile, the largest one being 5 ft. wide at some points. Some extremely rich specimens have been taken from this location and development work is now going on. The indications are that there is a continuous and valuable body of ore here. An interesting fact is that the veins on this property are in eruptive granite, a formation not generally found associated with gold-bearing rock. The Little American mine, which is in Minnesota, about three miles south of the international boundary, is the only mine in the district at which actual milling operations are being carried on. A five-stamp mill is at work and gold bricks are being turned out. A run of 30 tons of ore in 48 hours gave a yield of about \$500 worth of gold and about half a ton of concentrates. The ore is largely free milling, but there is a not inconsiderable proportion of sulphides in which the gold is of course more refractory.

North of the Rainy Lake district proper lies the Lake Manitou country, where the geological and mineralogical conditions are very similar; in fact the latter region may be considered a continuation of the former. Some extraordinarily rich specimens have come from the upper part of Manitou Lake, and several true fissure veins have been found, 6 or 8 ft. wide at points. The gold-bearing area extends north of the Canadian Pacific Railway, and the prospectors, who have been overrunning the region south of the line all summer, have begun to turn their attention to the northern tract, which will probably be the scene of considerable activity next year.

With respect to the field in general, Dr. Coleman thinks that many of veins will not justify large development work, but that some of the ore bodies located will probably prove to be large and continuous, and will give important results. It would be an extraordinary circumstance if in a territory so large, throughout which gold is found in so many places, some deposits were not discovered of great extent and value. Custom mills erected at various points would serve a very useful purpose in affording the means of utilizing the ore found in the smaller veins, which, though rich, is not in sufficient quantity to warrant the erection of separate plants. A curious fact is that wherever galena is found free gold is also found, though the relationship between the two minerals is not very apparent.

The facts already ascertained are sufficient to justify the hope that a large and important gold-producing industry may ere long take its rise on the now lonely shores of Rainy, Manitou, Shoal and other lakes of northwestern Ontario. Communication with the outer world is as yet difficult and tedious, the route being via the Canadian Pacific Railway to Rat Portage, and thence by steamer through Lake of the Woods and up the Rainy River to Fort Frances, at the foot of Rainy Lake, where a fall prevents further navigation. At this point on both sides of the river towns are springing up, and it is proposed to turn the immense water power here to industrial advantage. Rainy Lake is a large body of water with an extremely irregular and very long coast line—almost as long as that of Lake Ontario. This fact very much facilitates travel and exploration.

The forest fires which devastated parts of the Western States during the drought of last summer did not spare the Rainy Lake country. Destructive conflagrations burned up large quantities of pine and other timber, and filled the whole district with smoke, so that it was often difficult to see more than a few feet away. Deplorable as is this waste of timber, these severe fires leave the country in better shape for the prospector, in clearing away the tangled maze of small timber and leaving the rock better exposed to view.

A large number of mining leases have been taken out from the Crown on properties in the Rainy Lake region, and speculation in lands is active. Complaints are heard, as in all newly opened mining districts, that a few individuals are trying to monopolize the best lands, but the mining laws of the Province, while liberal, do not regard with favor any attempts of this kind, and would-be monopolists are not likely to find the scene of operation a satisfactory one.

Some Black Hills History.—To day (November 17th), says the Deadwood "Pioneer," is the anniversary of the location of the first mining claim taken up on Deadwood Gulch, the notice of which read as follows:

"We, the undersigned, claim for mining purposes 900 ft. up this gulch from this notice, and 300 ft. below said notice for discovery. Located November 17th, 1875.

FRANK S. BRYANT,  
WILLIAM H. CODER,  
WILLIAM CUDNEY."

Said notice was written on a blazed spruce tree immediately opposite what is now known as Sawpit Gulch, about the middle of Deadwood, which at that time had no name. It was supposed then that to make a placer discovery it was necessary to first find gold and next to find bedrock. As the center of the creek was very springy, a place was selected near the south side of the gulch; part of the 16th and the forenoon of the 17th were spent getting to a point of high bedrock. Good prospects were found, and as a snowstorm was coming the above notice was hurriedly written when we pulled down the creek to our cabin on Whitewood Creek, situated out in the middle of the flat opposite Spruce Gulch. On November 16th, 1875, the first gold found in quartz in the Hills was discovered. This discovery was made on the divide between Deadwood and Sawpit gulches about 250 or 300 yds. above the old Rhoderick Dhu mine. The Rhoderick Dhu lode has since been relocated, and is now known as the Columbia, and the claim on which the free gold in white quartz was found upon the date before mentioned was afterward located and named the Erin. The piece of quartz showing the gold was taken to camp and crushed between two rocks and panned. The result was three nice colors of bright yellow gold—that was the instance of the first gold quartz crushing in the northern Black Hills.

THE MINERAL AND METAL PRODUCTION OF SWEDEN IN 1893.

From the official report of the mineral, metallurgical and coal industries of Sweden in 1893 which has just been issued, the following notes are abstracted:

The total production of magnetic iron last year in Sweden amounted to 1,481,487 metric tons raised from 341 mines, whereas in 1892, when 353 mines were being worked, the entire output was only 1,291,933 tons. As regards the yield of ore in ratio to the output of iron-bearing rock, the total quarrying of the latter amounted to 2,718,354 tons, making an average return of 54.5% for the 11 iron-producing provinces of the country. In 1892 the rock quarried amounted to 3,312,692 tons, the yield of ore to 1,291,933 tons, and the average return to 55.9%. Of the total production last year 1,194,298 tons, or 80.6%, were magnetic iron ore, and 287,187 tons, or 19.4%, hematite. The latter kind of ore is rare and occurs only in four provinces. The great increase in the output of iron ore in Sweden last year is principally due to the enormous advance in the production from the famous Gellivara iron deposits in the province of Norrbotten, where it rose to 306,594 tons in 1893, as against 178,181 tons in 1892, and only 200 tons in 1891. The output, too, is steadily increasing, being estimated this year at 400,000 tons. The ore is mostly shipped to Westphalia and Silesia, but a considerable quantity goes also to Great Britain. In the south of central Sweden, where are situated the celebrated Grangesberg mines, the output rose from 110,237 tons in 1892 to 182,657 tons in 1893, nearly the entire quantity going to Germany. Only a few years ago these mines were idle through the lowness of prices of ore prevailing abroad. The Gellivara and the Grangesberg iron ores average from about 50% to 53% of pure metal.

The following table shows the output of iron ore since 1861, the number of miners employed and tons mined per miner, in metric tons:

Years.	No. of mines.	Output, tons.	No. of miners.	Tons per head.
1861-1865.....	500	4,4363	5,501	80.7
1866-1870.....	422	555,729	4,581	118.4
1871-1875.....	376	795,363	6,459	121.9
1876-1880.....	382	726,712	4,883	147.7
1881-1885.....	496	877,418	6,210	140.8
1886-1890.....	530	932,470	6,257	148.7
1889.....	383	985,904	6,238	157.7
1890.....	390	94,241	6,335	148.4
1891.....	346	987,105	6,221	158.3
1892.....	353	1,293,583	7,564	170.8
1893.....	341	1,483,762	7,510	197.3

These figures include ore raised from lakes or bogs, which has varied widely in amount of late years. In 1892 it was 1,650 tons, and in 1893 2,275 tons. The main output is furnished by five provinces as follows: Kopparberg, 28%; Norrbotten, 20.7%; Orebro, 20.3%; Vestmanland, 15.8% and 10.9% by Vermland and Upsala lan, so that only 4.3% are returned by the remaining five iron-bearing provinces. During the year there were in operation nine iron ore separators, by which 13,575 tons were treated.

The pig iron industry shows that 152 furnaces were in blast at 134 works, returning 453,421 tons in 37,276 shifts of 24 hours, of which 6,059 tons were produced "direct." There were also 47 furnaces not in blast. In 1892 the production amounted to 485,664 tons in 37,405 shifts. The production in the period 1861-93 has been as follows in metric tons:

Year.	Pig iron.	Direct.	Totals.
1861-1865.....	159,373	5,451	204,826
1866-1870.....	261,810	6,044	267,854
1871-1875.....	326,510	5,916	332,426
1876-1880.....	350,414	6,810	357,224
1881-1885.....	423,176	6,201	429,377
1886-1890.....	411,876	4,702	416,578
1889.....	416,043	4,622	420,665
1890.....	451,443	4,660	456,103
1891.....	486,680	4,233	490,913
1892.....	478,696	6,968	485,664
1893.....	447,362	6,059	453,421

The principal decrease in output falls upon the following provinces: Kopparberg, 13,809 tons; Vermland, 6,644 tons; Orebro, 7,775 tons; Vesternorrland, 3,359 tons; Gefleborg, 2,106 tons; Ostergotland, 1,638 tons, etc. The falling off varies from 3 to 71%. It is worthy of note that two provinces, Orebro and Kopparberg, have from time immemorial returned more than half of the total pig production of the country. Pig iron is manufactured in 13 provinces. The average output per furnace for the year was 2,883 tons; and the average time in blast, 245 shifts of 24 hours; and the average diurnal return 12.18 tons.

The production of pig iron, malleable iron and sheet was divided as follows:

	Tons.	Unwelded blooms and raw bars.....	Tons.
Forge and puddle iron.....	285,718	Unwelded ingot metal.....	225,532
Bessemer and Martin iron.....	145,479	Blister steel, etc.....	664
Spiegel iron.....	1,294		
Pig iron for reduction.....	6,922		
Pig iron for other purposes.....	7,949	Totals.....	393,941
Totals.....	447,362		

Malleable iron and steel was produced at 153 works, as against 154 in 1892, situated in 19 provinces, Orebro and Kopparberg possessing respectively 25 and 21. There were in operation 349 Lancashire hearths, 43 Franche-Comte hearths, and 25 Walloon hearths; while in the production of Bessemer metal were employed 30 furnaces, and in the production of Martin metal also 30, with six crucible furnaces.

Of the total production of blooms, etc., 208,802 tons, or 92.6%, were produced by the Lancashire method, and the Franche-Comte process turned out 14,942 tons, or 6.6%. The output of blooms and raw bars has been as follows: 1889, 226,071 tons; 1890, 225,632 tons; 1891, 224,651 tons; 1892, 235,426 tons; 1893, 225,532 tons. There is therefore a decrease in 1893 of 9,894 tons, or 4.2%. The prices of this kind of iron have been low of late years, and the demand has been small. The production of Bessemer steel amounted to 84,398 tons, 50.6%; of Martin steel to 81,889 tons, 49.1%; and of crucible steel to 558 tons, 0.3%. The manufacture has been as follows:

Year.	Bessemer.	Martin.	Crucible.	Total
1889.....	80,324	55,487	513	136,324
1890.....	94,247	72,985	646	167,878
1891.....	92,985	78,197	707	171,889
1892.....	82,422	76,556	617	159,595
1893.....	81,398	81,889	558	163,845

The total increase in the production of steel is therefore, in 1893, 7,250

tons, or 4.4%. In these figures are included 23,467 tons of steel produced by the basic dephosphorization method, viz., 8,419 tons Bessemer and 15,048 tons Martin steel.

The manufacture of finished iron and steel goods amounted to 288,317 tons, as against 293,036 tons in 1892, a decrease of 4,719 tons, or 1.6%. The following table shows the detailed manufacture in metric tons:

	Production	Welded, Ingot.
	1892.	1893.
Blooms, billets, etc.....	11,222	8,726
Bar iron and steel.....	145,173	146,042
Fashion iron and steel.....	6,583	7,313
Hoops and nails.....	72,156	70,828
Wire rods.....	38,476	33,818
Heavy plates.....	8,138	10,721
Rails.....	6,627	5,677
Bottom boiler plates.....	1,579	1,041
Tires.....	975	1,343
Axles.....	1,223	1,640
Anchors and cables.....	984	1,205
Total.....	293,036	288,317

In 1892 the manufacture of such goods from welded iron was 63.6%, and from ingot metal 36.4%; so that there is an increase in the manufacture in 1893 by the former of 3.8%. Bar iron and steel were produced in 18 provinces, the largest returns being as follows: Vestmanland, 32,888 tons; Gefleborg, 20,642 tons; Kopparberg, 19,718 tons; Ostergotland, 18,030 tons; Orebro, 17,046 tons; Vermland, 15,185 tons; and Upsala, 12,608 tons; the remaining 11 only producing 9,925 tons together. Rails are only manufactured in Kopparberg lan and tires only in Gefleborg. The production of actual bar iron of all denominations was as follows: 1887, 274,734 tons; 1890, 281,833 tons; 1891, 280,430 tons; 1892, 273,510 tons; 1893, 266,727 tons. It appears that the quantity of bar iron produced by rolling is twice as great as that returned by forging. Of the total output 62,699 tons, or 67.8%, were rolled from hard prepared iron; and 29,733 tons, or 32.1%, from ingot metal; whilst again 39,495 tons, or 91.7%, were rolled from blooms; and 3,160 tons, or 7.3%, from welded iron. Vestmanland lan shows the greatest production of rolled bars, viz., 23,728 tons; and Orebro the greatest production by forging, viz., 9,440 tons.

The production of other ores during 1893 was as follows, in metric tons:

	Mines.	Tons.	Mines.	Tons.	
Gold.....	1	2,441	Manganese.....	12	7,061
Silver.....	25	21,043	Pyrites.....	1	480
Copper.....	13	22,033	Cobalt.....		101
Zinc.....	26	46,623	Fireclay.....		138,469

The production of gold amounted to 93.3 kilos., as against 120 kilos. in 1892; the average annual production is 99.3 kilos. The production of other metals was as follows: Silver, 4,436 kilos. (1892, 5,210 kilos.); lead, 462 tons, average 425 tons; copper, 544 tons, average, 605 tons.

Among the other articles produced are the following:

Cobalt oxide.....	3,298 Kg.	Mineral paint.....	1,370,868 Kg.
Sulphur.....	75,000 "	Litharge.....	10,189 "
Sulphate copper.....	659,031 "	Alum.....	357,495 "
Copperas.....	453,846 "	Graphite.....	49,350 "

Coal is only found in the province of Scania, in the extreme south, seven fields being worked. As it is a lignite it is no use in the iron industry, but largely used on the railways of south Sweden, special grates having been introduced for the purpose. The detailed production was as follows: No. 1 coal, 110,518 tons; No. 2 coal, 70,320 tons; No. 3 coal, 19,031 tons; refuse, 64 tons; total, 199,993 tons.

The output in the period 1889-93 has been as follows: 1889, 186,719 tons; 1890, 187,512 tons; 1891, 198,033 tons; 1892, 199,380 tons; 1893, 199,933 tons. The number of collieries employed was 1,217, as against 1,260 in 1892. The motors engaged in these industries numbered 1,881 of 61,169 H. P., of which about 50,000 were furnished by water and 10,000 by steam. The total number of hands employed was 25,811, of whom 11,330 were employed in the mines, 14,481 at the works; some 500 women were employed in the iron mines. There were in all 49 accidents, 22 being fatal.

IMPROVEMENTS IN STORAGE BATTERIES.

Specially Written for the Engineering and Mining Journal by Maurice Barnett.

The recent award by the Franklin Institute of Philadelphia to the inventor of the "chloride accumulator" is indicative of the great commercial importance attached to the use of secondary batteries for storage purposes. That the recipient of the medal is a Frenchman is not strange, considering that France is far ahead of the United States in its application of accumulators to the uses of central stations for electric lighting and traction work. In Paris alone 21 stations are supplied with these storage cells (containing 760 tons of plates) which run 120,000 lamps. Paris has three lines of cars run by chloride accumulators, while the same system is in use at Cannes, Boulogne, Sur Mer, Nantes, Clichy and other towns. Stimulated by the hope of reward from a new and increasing industry, French genius had been for a long time directed to this branch of electro-economics, with the result that a Frenchman's efforts produced the successful solution of electric storage. That is why the honor of the award of the Scott medal fell to foreign rather than to domestic genius.

Although electric companies in the United States have been backward in taking advantage of efficient secondary batteries as an adjunct of their generating systems, the recent placing by the Edison Company, of New York, of a large order for accumulators of the French type, is exceedingly suggestive, indicating a tendency to follow the example of foreign companies. The necessity for such accumulators in the central stations of electric lighting companies, for traction work and for large office buildings, is apparent after momentary consideration. In electric lighting stations it is found that during the winter months, for a few hours every night, the generating plant is loaded beyond its capacity, while during the summer months the load is carried easily. It is obvious that a simple generating plant must have a capacity equal to the maximum demand that may be made upon it. Furthermore, the day load at no time of the year is of sufficient importance to justify the expense of running. Inasmuch as day lighting is necessary, electric companies frequently run during that period at a loss to themselves. It is here that the storage

battery proves of great commercial value; for with the help of a secondary battery a generating plant does not need to have a capacity sufficient to satisfy the maximum demand, as a much smaller generating plant worked up to its full capacity in connection with a set of accumulators, can store up its surplus output and make a requisition upon it during the hours of the day when the load is in excess of the capacity of the dynamo. Such storage batteries can carry the day load and furnish light on Sundays without the necessity of operating a power plant at those times. Besides the economy in wages and fuel, there is a great opportunity to lower the cost of installing a power and generating plant as a small generating plant with the aid of secondary batteries can do the work of a large and more costly installation of generators alone. With regard to the lighting of large office buildings it has been the custom either to buy the light from electric lighting companies or to operate a dynamo plant and produce the light in the buildings themselves. Both of these practices involve a rather large tax upon the income of the owners of these office buildings, as, in the first case, the lighting company's charges are frequently excessive, and in the second case day and night help must be maintained. It is the experience of companies using storage batteries that they can have light every hour of the day, Sundays included, and get along with the help of one engineer. Lastly, the advantages of accumulators to electric railway plants would be obvious if for no other purpose than in saving the engines and dynamos from the great fluctuations of load so noticeable in these plants. In such cases a storage

power was entirely superseded over a year ago, and a new line running from the Saint-Ouen Town Hall to Neuilly is now being supplied with the same type of accumulator.

Although theoretical and practical considerations affecting electric storage have long held out great promise to the inventor of an accumulator efficient under all the conditions to which it might be exposed, it has only been within a very few years that such a storage cell has been perfected. The cause of this is to be found in the fact that inventors have been led astray for a number of years by erroneous methods; and in trying to make the "pasted" battery meet the demands of modern engineering, have failed most signally. Of late years there has been a tendency to revert to the Planté type of battery, which has been improved by French genius until, in the modernized form of this battery, founded on correct mechanical and scientific principles, we have an accumulator of a very high grade of excellence.

The qualities that a good storage battery must have are :  
 First. Non-liability to mechanical disintegration after continued use or during rapid charges or heavy discharges.  
 Second. A large active surface for small weight of elements.  
 Third. Good contact between the active surface and the inclosing frame.  
 Fourth. Low internal resistance.  
 The old method of producing lead storage batteries was to phase the lead plates slowly by electrolysis until they had the required spongy condition. The later way is to cast a frame of lead, ribbed normally in two

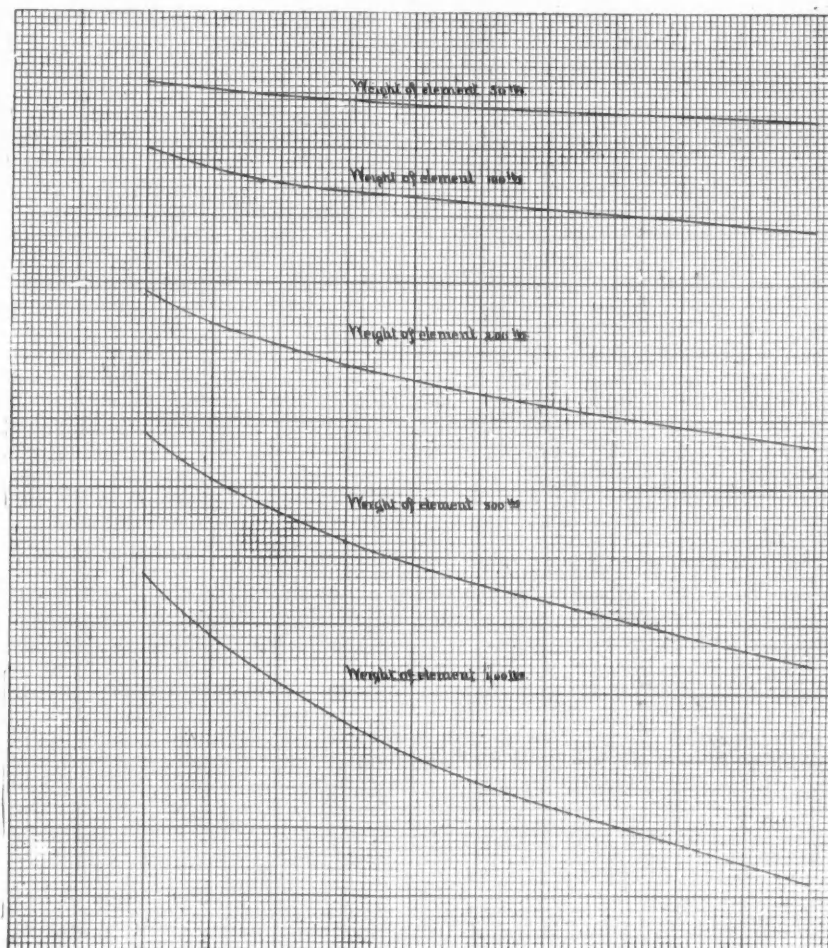


FIG. 1.

battery soon pays for its installation. If such a system is placed at suitable points along a railway line considerable "feed wire" can be done away with, and a more even pressure of current maintained. These auxiliary plants act automatically, and require very little attention. Their value is most apparent when it is considered that a break in the supply circuits or a shutting down in the generators does not necessarily involve the stoppage of the cars. Installations of these batteries can be made to carry the whole load late at night and early in the morning, when few cars are running—the income from operating which by generators would not defray expenses. As an instance in which the application of electric accumulators to traction purposes has been crowned with commercial success may be mentioned the two lines of cars running from Paris into the suburb of St. Denis, the combined length of which is 11 miles. The power plant consists of three 150 H. P. boilers, three 150 I. H. P. engines, and a number of dynamos of 250 volts and 300 amperes output each. Each of the cars of the company is furnished with 108 storage cells designed especially for traction purposes, and of a capacity capable of running the car a distance of about 40 miles under the conditions of the severe gradients and curves along these lines. Considering that the gradients are frequently as high as 4 per cent., that the cars are intended to carry 50 persons, that the weight over all is 28,000 lbs., that 52 batteries of 5,616 cells and 61,776 plates perform an equivalent of 1,550 car-miles daily, and that up to May 1st, 1894, one million car-miles had been run since accumulators supplied the motive power—the feasibility of using storage batteries for traction work is very apparent. The success attending the use of these batteries was so great that horse

directions with square depressions between the ribs, or to punch a lead plate full of holes and fill these with a pasty mixture of red oxide of lead in positive plates and litharge in negatives.

Accumulators made in this way can hardly be said to possess, in a high degree, any of the four qualifications just mentioned. It is almost invariably noticeable with such cells that when they have been in long use or during heavy discharges mechanical disintegration of the plates takes place—shown by small fragments of lead and lead oxide falling down between the elements, short-circuiting them and in many cases causing serious damage by producing either buckling, sulphating or both. This disintegration is evidently due to the fact that the lead oxide paste placed in these holes is a mechanical rather than a chemical compound, and that during the action of the cell the cohesion of the particles is ruptured by the change of volume attending chemical action. Furthermore, the process of cementing lead oxide paste into or against a lead frame in order to obtain the necessary active material will not produce the porosity and surface area which will give a maximum of capacity for a given weight and size of cell—a feature of great importance where storage cells are destined for traction purpose. Lastly, cells made in this way show a poor contact between the active substance and the lead frame. The result of this is increased internal resistance and heating, with consequent diminished output.

Some years ago, John Scott, of Edinburgh, gave the city of Philadelphia a sum of money, the interest on which was to be used for the encouragement of "ingenious men and women who make useful inventions." The legacy provides for the distribution of a medal inscribed

"To the most deserving," and a money premium. The Board of City Trusts of the city of Philadelphia delegated to the Franklin Institute the power to examine inventions and award the Scott medal and premium. The investigations are made by the Institute under the competent assistance of its "Committee on Science and the Arts," and recommends for the award all meritorious inventions.

The committee that was appointed to investigate the merits of the "Chloride Electric Storage Battery," or "Chloride Accumulator," handed in its report recently, and recommended the award of the John Scott Premium and Medal to Clement Payen, the inventor. Incidentally, mention was given Mr. Herbert Lloyd, of Philadelphia, for important improvements made in the Payen cell. As this accumulator is considered by the ablest electrical engineers in the country to mark an era in the history of electric storage batteries, a description of its construction with some comments upon its efficiency will doubtless be of value to any one interested in electrical science.

The method of construction of these cells would seem to make possible of production a secondary battery that would possess the important qualifications, just mentioned, of non-liability to mechanical disintegration after continued use or during heavy discharges, a large active surface for small weight of elements, a good contact between the active material and the inclosing frames, combined with low internal resistance. The active material is obtained, not as in the old way, by cementing lead oxide paste into a frame, but in a manner purely chemical. A mixture of the chlorides of lead and zinc, in certain proportions, is fused, and the product cast into pastilles in suitable molds. When thus cast, the mixed chlorides are of a whitish color, vitreous character and very brittle. The pastilles to be used for negative plates are about  $\frac{1}{4}$ -in. in cross section and

tion of chance how they are arranged, and they have no cohesion among themselves beyond that which is given to them by the cementing mixture which holds them together. In the crystalline form, however, all this is changed; the molecules of the body are arranged in perfect symmetrical order, and they are held together by molecular affinities which regulate the order of their distribution and secure the coherence of the mass." In other words the particles of this spongy lead and peroxide are bound together far more strongly than it is possible in "forming" plates by the old method of mechanical mixtures. Beyond this it is obvious that the peculiar structure of this spongy lead admits of a maximum active surface of uniform consistency through the entire plate—save where the antimonial lead frame intervenes. And as the capacity of a cell of given size and weight depends upon the amount of chemically active material, the cell under discussion will require less floor space than other accumulators.

Although the construction just described seems thoroughly effective in preventing the tendency to disintegration, it has nevertheless been considered expedient, as a precautionary method solely, to introduce between the plates a thin sheet of woven asbestos cloth so that any small particles which might be detached could not short-circuit the cell. It is found that this asbestos increases the resistance of the cell to a very small extent—which is compensated for, however, by the fact that the contact in this accumulator is exceptionally good owing to the shape of the chloride pastilles, and to the fact that they were cast in the frame under pressure. The internal resistance is no greater than in other lead cells, being about .002 ohm.

If the data were available, it would be exceedingly interesting to compare the relative capacities of the "chloride accumulator" with other

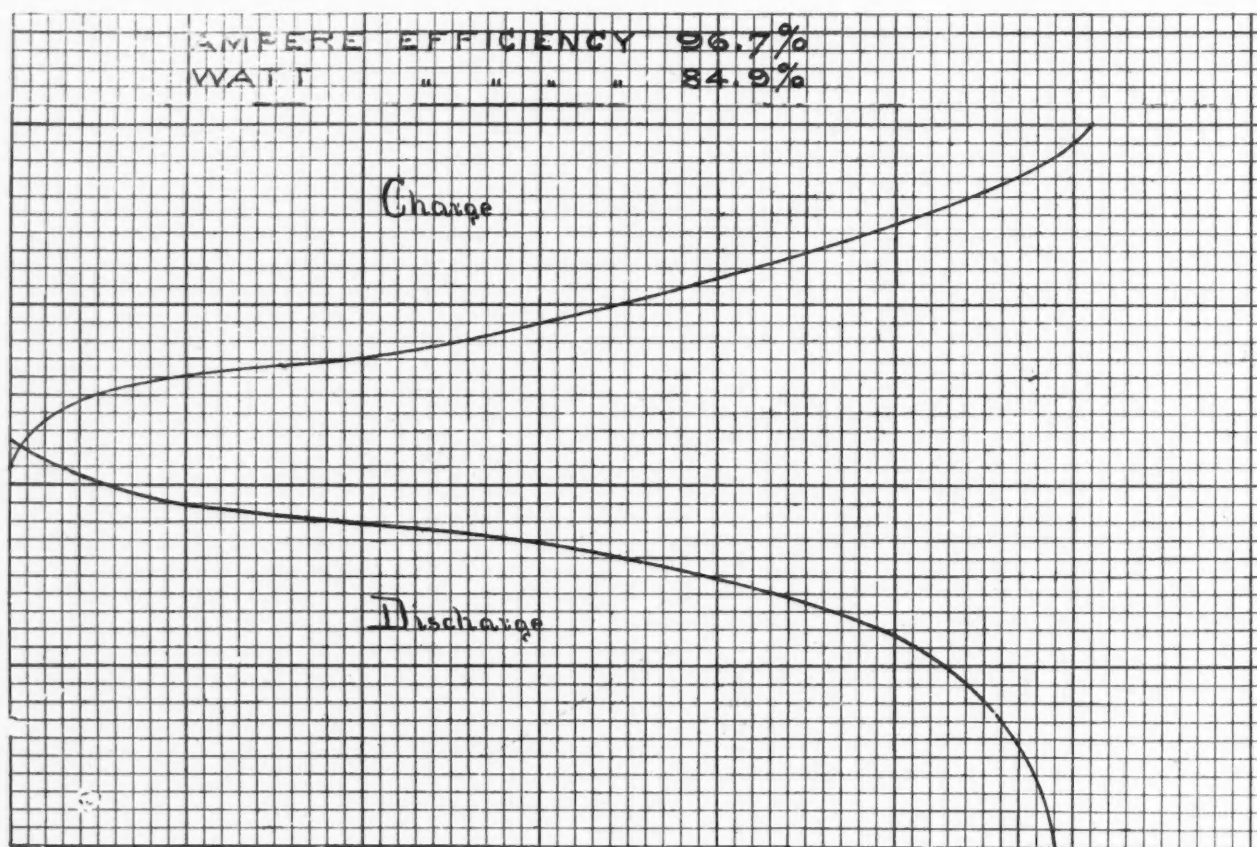


FIG. 2.

$\frac{5}{16}$  in. thick, and are cast in groups of four which are united by filaments from  $\frac{3}{16}$  to  $\frac{1}{2}$  in. thick. The "positives" are cast separate—each one having a beveled V-shaped periphery. These pastilles are then placed in a suitable mold, and molten antimonial lead cast around them under high pressure. This feature of casting under pressure is one of the improvements due to Mr. Herbert Lloyd, and has been patented by him. The connecting sheets of the negative groups, the V-shaped bevel of the positives and the casting under pressure combine to make the fixation of the active matter exceedingly good. The frames alternating with zinc plates in metallic contact are then immersed in a bath of dilute zinc chloride. This arrangement acts like a primary battery that has been "dead short-circuited," with the result that the chemical changes which take place effect the removal of the zinc chloride. There is then left the dense frame of antimonial lead containing, now, pastilles of spongy lead, which are then "formed" in the usual manner.

This lead on examination is found to be crystallized in such a way that the longer axes of the crystals are regularly arranged normal to the surface of the plates. The advantage of this is that between the crystals there are spaces which permit the changes of volume, which occur from the action of the cells, to take place without producing lateral stresses upon the crystals or in any way causing their disintegration. Owing to this circumstance heavy discharges can take place without mechanical violence to the structure. Furthermore, the cohesion of the pastilles of this spongy lead, and consequently of the peroxide of the "formed plates," is very great; for it is well known that "in a crystalline form the molecules of matter are arranged in a different order from what they are in any mechanical mixture. In the mechanical mixture the aggregation of the atoms is strictly fortuitous; that is to say, it is a mere ques-

storage cells manufactured in this country. Unfortunately, makers of strictly American types of secondary batteries have not published information regarding the capacity and efficiency of their cells. The only information at hand is a table of comparative capacities per pound of positive and negative plates, compiled by Hardman Arthur Earle, and covering only the French, German and English types. A glance at this table shows the status of the art in Europe and the position held by the chloride accumulator. The Crompton-Howell is the English type, and the Tudor the German type, of storage cell.

Type of accumulator.	Rate of discharge.			
	Small.	Normal.	Strong.	Maximum.
Capacity in (Chloride (Payen cell).....	8.1	6.7	5.8	4.
ampere-hours. (Crompton-Howell.....	2.8	2.34	1.7	1.17
(Tudor.....	2.2	1.9	1.7	1.48

As Figs. No. 1 and No. 2 will be readily understood by any one versed in electrical matters, no other explanation is necessary. Fig. No. 1 represents the capacity of the chloride accumulator at different rates of discharge, and Fig. No. 2 the E. M. F. during charge and discharge.

In conclusion it may be said that this battery is destined to play an important part in the economy of light and power installations. It is manufactured abroad by the Société Anonyme pour le Travail Electrique des Métaux of Paris, France, a company controlled by the Rothschilds, and by the Chloride Electrical Storage Syndicate, Limited, of Manchester, England, of which Dr. Edward Hopkinson is managing director. In this country the Electric Storage Battery Company, of Philadelphia, has undertaken its manufacture under the management of Mr. Herbert Lloyd, whose name was mentioned in connection with having taken out patents in the United States for improvements in the manufacture of the Payen cell and its adaptation to traction purposes.



ABSTRACTS OF OFFICIAL REPORTS.

Broken Hill Proprietary Company; New South Wales.

The report of this company for the half-year ending May 31st, 1894, shows that the total receipts for the half-year were £1,114,000, made up as follows: Bullion account, £573,935; refinery account, £530,282; ore on hand at Port Pirie, £9,017; wharfage, £766. The expenses for the half-year were £678,286, made up as follows: Mine expenses, £177,418; smelter expenses, £262,700; refinery expenses, £27,191; freight, insurance, stores, and other sundry accounts, £210,977. The balance, the gross profit on the six months, was £435,714. The profit and loss accounts show results as follows: Balance or gross profit for the half-year as above, £435,714; transfer fees, interest, etc., £4,922; balance from previous half-year, £474,840; total, £915,476. On the other side of the account the payments were as follows: Depreciation account, amount written off at rate of 10%, £30,153; office expenses, directors' fees, etc., £13,105; dividends, No. 79 to 84 inclusive, £312,000; total, £355,258, leaving a balance carried forward to the current half-year of £560,218. Of the amount above as dividends, £28,000 were paid in dividends and £24,000 as a bonus.

The general course of operations for the half-year is so well expressed in the report of Mr. John Howell, the general manager, that we give the substance of that report below:

"The ore extracted from underground during the past six months has been principally from the old and previously developed ore bodies. Some valuable new discoveries have, however, been made, the most important of which is in Block 11, between McBryde and Drew shafts, on the 200 and 300-ft. levels, and east of the old workings. The extent of this ore body has not yet been fully determined, but sufficient exploration work has been done in and around it to prove that it is both extensive in area and rich in silver.

"The open cut work has been carried on extensively and vigorously during the half-year, and a large quantity of ore extracted from the open cuts which now extend nearly the whole length of the mine. In order to allow free scope for extension of this work, McCulloch, Brodribb and McBryde shafts have been dismantled and cut down, but will be used hereafter at lower levels, whilst ore bins and other erections which were constructed on the line of the lode years ago have been removed, and the hill is now pretty well cleared of machinery from the south end of Block 11 to the north end of Block 13. Between Wilson and McCulloch shafts, at the north end of Block 13, the quarrying, in one place, has reached the 100 ft. level, and a contract has been let (and operations thereunder commenced) to cut down the high hill between Wilson shaft and the Block 14 boundary. Very little work has been done in this section of the mine from the high outcrop down to the 100 ft. level, but we expect to find a large quantity of iron fluxing, lead, and concentrating ore in this ground. Immediately south of McCulloch shaft the cuts have, for a short distance, reached a depth of 70 ft.; for the remainder of the distance from McCulloch to Jamieson shafts—over 1,500 ft.—the cutting is but 50 ft. deep. In this long stretch on the line of the lode a continuous body of payable ore is left underfoot, and in the vicinity of Jamieson shaft the last bench of the 50 ft. cutting has exposed the apex of a new ore body west of the workings in the main lode. The extent and value of this new ore body will be determined before the expiration of another six months. South of the ground just described, and between Jamieson and McBryde shafts, open cut work has been commenced within the last half-year, and is at present furnishing large quantities of iron fluxing and dry silicious ores; the latter being treated in the amalgamating mill. All classes of ore coming from the open cuts are increasing in value as depth is attained, with the exception of the ore coming from a length of about 400 ft. immediately north of McBryde shaft, which has, so far, shown no change. None of the last-described cuts is, however, more than 30 ft. deep. From McBryde shaft to the south end of Block 11 very extensive work has been carried on, and a great quantity of waste material has been removed. We are now getting fairly into the lode on the east side, and large quantities of manganic iron flux of an excellent quality and other characters of ore are being extracted. The lode is widening as we sink on it, and has an underlay both to the east and to the west, as will be seen in the cross sections at MacGregor shaft, and at point 250 ft. north of MacGregor shaft on the transverse section map. It is evident that there is a large body of ore between the present bottom of this cutting and the worked and timbered portion of the mine along the line of the 100 ft. (No. 1) level. The open cuts, as a whole, are now producing all the iron fluxing ores used in the 15 furnaces on the mine, the three British Company's furnaces, and the six furnaces at Port Pirie. Some very rich silver ores have been obtained from the quarries during the past two months in the vicinity of Patterson and Wigg shafts. A much greater quantity of waste material has been removed from the cuts in the past half year than was necessary to enable us to extract the ore which has been obtained, but the cuts had to be widened, and a safe batter given to their walls to allow us to get down 100 ft. deeper. The benefit of this extra work done during the period will be beneficially felt in the ensuing half-year. This removal of waste material disproportionately to ore cannot be avoided. During the six months we have obtained from the surface openings 68,659 tons of ore, which has been reduced in the various metallurgical plants, together with 9,500 tons in reserve on the surface, making a total extraction of 78,159 tons. We have also recovered 196,113 superficial feet of mining timber.

"During the half year there has been mined from all sources and reduced in the various metallurgical works 257,278 net tons of ore, producing 7,287,337 oz. of silver, 25,638 tons of lead, and 441 tons of copper, the last-named being contained in 1,017 tons of copper matte; this is equal to an average per week of 280,282 oz. of silver, 986 tons of lead, and 17 tons of copper. The quantity of ore treated and the production from the different plants are as follows:

Plant.	Ore treated. Tons.	Silver. Oz.	Lead. Tons.	Copper. Tons.
Mine furnaces (15).....	146,225	4,320,354	17,159	315
British Company's furnaces (3).....	41,666	1,039,318	4,467	67
Port Pirie furnaces (5).....	40,694	1,264,641	3,485	45
Refinery furnace (1).....	6,392	357,756	498	14
Amalgamating mill.....	11,787	194,825	.....	.....
Leaching plant.....	10,514	110,443	29	.....
Total.....	257,278	7,287,337	25,638	441

"The cost per net ton of ore for smelting has been: Mine furnaces, £1 8s. 2d.; British Company's furnaces (including rent), £1 3s. 1.25d.; Port Pirie furnaces, 17s. 7.27d.; refinery furnaces, 19s. 7.20d.

"In addition to other important surface works, two lines of railroad have been laid, extending from about the middle of Block 12 to the south boundary of Block 11—one to the east and the other to the west of the open cuts, and sufficiently far away from the lode not to be interfered with by future operations; for this reason they may be regarded as permanent lines. The line on the eastern side connects with Weatherly, Drew, Wigg and Jamieson shafts. The western line connects with the chloridizing and new concentrating plants, the new sawmill and Dickenson shaft.

"Owing to some defects in the crushing, screening and elevating machinery of the chloridizing plant and some difficulties which have been met with in the leaching plant, these works have not been running very regularly, but we hope to remedy these before long.

"The amalgamating mill has been running successfully and continuously during the half-year with the exception of about five weeks, when it was shut down for general repairs. The ore treated has generally been of a low-grade silicious character, a large quantity being gathered up from the surface of the mine, where it had been thrown away as valueless years ago, but it is now worked at a profit.

"Nothing has been done in the way of concentrating carbonate or oxidized ores during the six months. The old concentrators have been removed from the site which they occupied on the crest of the hill between McCulloch and Muecke shafts, and a new and more commodious plant is being built on the west side of the new railway embankment immediately north of Dickenson shaft. We are well along with the erection of this plant now, and in about three months expect to have a portion of it started. We have already accumulated a large quantity of ore on the surface to be treated in these new works.

"The five furnaces at the Port Pirie Smelting Works have been running steadily during the half-year, treating about the usual quantity of ore at a lower cost per ton than during any previous similar period.

"The refinery blast furnace has also been running steadily, and has smelted more ore than during the previous half-year, at considerably less cost per ton; it has also worked up all the drosses from the refinery. The three furnaces situated on the British Company's mine, and leased by this company, have been running very steadily during the half-year, doing excellent work. They have reduced 42,554 net tons of ore, which has produced 1,021,115 oz. of silver, 4,467 tons of lead and 67 tons of copper in 150 tons of matte, at a cost of £1 3s. 1.4d. per ton of ore, including rent of furnaces.

"The refinery plant has treated 10,117 tons of bullion, [producing 9,108 tons of soft lead, 3,037,838 oz. of fine silver, 1,341 oz. of gold, and 165 tons of antimonial metal; also 380 tons of copper matte, containing 158 tons of copper and 45,175 oz. of silver. The cost per ton of bullion, for separating and refining, has been £1 9s. 3.4d., or 2s. 9.4d. per ton less than for last half, but the tonnage of bullion treated is considerably less. This is accounted for from the fact that an unusually large quantity of dross and other impurities was contained in some of the bullion sent to the refinery. The bullion as it is produced from the furnaces is not any more base than usual; but we are now, by a system of partial refining at the mine furnaces, concentrating the bulk of the drosses and other impurities into about one-third of the bullion produced, and all of this drossy bullion goes to our own refinery for treatment. As it is more difficult and takes longer to refine, the reducing capacity of the refinery has been correspondingly decreased. We find, however, that it is more satisfactory and much more economical to treat our bullion in this way than to let the unparted bullion, which is shipped to England to be refined, carry the usual quantity of dross and impurities.

"The vast quantity of machinery employed at the shafts and in the metallurgical plants on the mine and at Port Pirie is all in excellent condition and well preserved. The electric lighting plant has been enlarged, and the steam and lighting power nearly doubled. Powerful lights have been erected on the surface of the mine, so that the open cuts can be worked at night when required. The electric lighting underground has been extended to the principal working drives, and to all other places where fixed lights are required. Dickenson shaft, which is intended for deep sinking, measuring from the collar of the shaft, is now down 355 ft., which makes the bottom of the shaft over 400 ft. below the datum line of the old shafts on the mine. Nos. 2 and 3 levels are now connected with this shaft. The rock passed through for the past 70 or 80 ft. in depth has been hard giving out some water, which we expect will increase considerably at another 100 ft. in depth.

"We have given the matter of the treatment of sulphide ores considerable attention for the last three months, and a small experimental concentrating plant has been in operation for about two months treating the various characters of sulphides from different portions of the mine by wet concentration."

The Italian Engineering Congress.—A committee has been formed in Genoa to organize a congress of Italian engineers and architects, to be held in that city in the autumn of 1895. The congress will be divided into the following sections: Hydraulic engineering, architecture, sanitary engineering, bridges and roads, railways and tramways, naval architecture and general mechanical engineering, electrical engineering, mineralogy, metallurgy, and industrial chemistry, geodesy and agricultural engineering, military engineering, and technical education.

Liability for Damages Caused by a Strike.—A decision by the English courts which will make a valuable precedent has recently been rendered. It seems that 97 of the blast furnace employees of the Whitehaven Hematite Iron and Steel Company, Limited, struck on November 3d because they found that the pig iron carriers were to be superseded by a contractor who was going to employ his own men. When the men left work in a body there was some 700 tons of raw material in the furnaces. This was left standing in the furnaces, and it became utterly impracticable to deal with it. The minimum amount of damage thus caused was £800, but it might cost £2,000 or £3,000 to repair it, and it was possible that the two furnaces might be lost. Hughes, the founder, was ordered to pay £5 and costs, and all the other 97 workmen to forfeit all wages due to them, and each to pay costs.

**A Standard of Light.**—The Imperial Institute at Berlin has approved an apparatus intended to give a unit of light as nearly constant as possible, and capable of being reproduced without change under similar conditions. The apparatus is somewhat complicated, but it is claimed the margin of error is not over 1%. The standard is the light given out by a square centimeter of platinum leaf heated to a fixed temperature by an electric current. The complications in the apparatus are mainly due to the arrangements for regulating the current.

**English Coal Notes.**—The Royal Mail Steam Packet Company has recently placed its contracts for 1895. The company is one of the largest users of steam coal in Great Britain. The contract was divided among four operators, the largest amount given to one being 80,000 tons, to be delivered at Southampton, to the Cambrian Company. The average price is \$2.60 f.o.b. per long ton. Scotch coal exports show the effect of the miners' strike. For the eleven months to November 30th they were 4,645,923 tons, showing a decrease of no less than 2,643,977 tons, or 37% from last year.

**Mineral Production of Bavaria in 1893.**—In Bavaria, last year, 802,538 tons of coal, valued at £400,071, employing 4,949 persons, and 17,167 tons of lignite, valued at £2,903, employing 120 persons, were raised, with 149,271 tons of iron ore, valued at £29,422, employing 635 persons; 180 tons of manganese ore, valued at £90, employing 3 persons; and 2,108 tons of iron pyrites, valued at £1,054, employing 45 persons. The iron and steel works, employing 448 persons, produced 75,209 tons of pig iron, valued at £171,236; 49,909 tons of finished iron, valued at £296,682, employing 2,222 persons; and 60,824 tons of steel, valued at £329,013, employing 459 persons.

**The Asbestos Fields of Port-au-Port, Newfoundland.**—In a communication to the Mining Society of Nova Scotia, Mr. C. E. Willis says the metamorphic rocks and serpentines of Quebec dip under the Gulf of St. Lawrence to reappear on the western coast of Newfoundland, and extend probably across the island. The district, situated at and near the eastern coast of Port-au-Port Bay, near the southern boundary of the serpentine rock, is seamed in many places with asbestos, and contains veins of copper and specular iron. Only surface work has been done so far; but the asbestos fiber is of good quality, up to 2½ in. long, and practically identical with the Canadian product.

**Cause of Death in Coal Mine Explosions.**—As a result of elaborate investigations in English mines, says the "Popular Monthly," Dr. J. S. Haldane has come to the conclusion that in colliery explosions the deaths from suffocation are due, not as is generally supposed, to carbonic acid gas, but to the preponderance of nitrogen and the deficiency of oxygen. Life could be saved if the colliers could be supplied with oxygen for an hour or so; and the author has devised an apparatus for enabling a man to breathe oxygen, of which 60 litres are compressed into a half-litre bottle, with tube and regulating taps, supplemented by a wire compress for the nose to prevent breathing through that organ.

**A Suspected New Mineral.**—In a communication from F. C. Knight, chemist of the Boston & Colorado Smelting Company, to the Colorado Scientific Society, attention is called to a suspected new mineral recently observed occurring with the Cripple Creek tellurides. Analyses of the soluble portion of the mineral show it to contain  $\text{Te}_2\text{O}_3$  30.27%;  $\text{TeO}_2 + \text{SeO}_2$  68.05% and  $\text{H}_2\text{O}$  1.68%. Replacing selenium by an equivalent of tellurium the formula corresponds nearly to  $2(\text{Fe}_2\text{O}_3 \cdot 2\text{TeO}_2) + \text{H}_2\text{O}$ . The insoluble portion is identical with calaverite, containing Au 40.14%; Te 56.22% and Ag 3.63%. Dr. Richard Pearce regards this mineral as an alteration product having a definite chemical composition and formed by the oxidation of the tellurides, and formation of a tellurite or tellurate of iron.

**Electric Heating of Railway Cars.**—On the Mont Saleve Rock Railway, in Savoy, which is worked by electricity generated by water power, electric heating has been introduced into the carriages. The heating apparatus consists of two resistance boxes, 33 in. wide by 12 in. high and 7½ in. broad, each containing 42 coils of galvanized iron wire 1½ mm. thick. These coils are 1 in. in diameter, and contain about 20 ft., or between 500 and 600 yds. in each carriage. The current is taken directly from the rail conductor and passes through the coils, which are coupled in tension. The quantity absorbed is 15 amperes, which at 500 volts represents about 10 H. P. The temperature of the wire is raised to the boiling point of water, and that of the carriage is easily maintained at 60 to 70° Fah., even in the coldest weather. In spite of the large amount of power required, this system of heating is possible on account of the traffic being small in cold weather, only four carriages being usually required, so that 30 or 40 H. P. can be spared for the driving current for conversion into heat. The cost of the apparatus is £28s. per carriage.

**Method of Working up Molybdenum Residues.**—H. Borntrager says in the "Zeitschrift für Anorganische Chemie" that the method he uses for this purpose is grounded on the fact that molybdic acid is soluble in ammonia, but almost insoluble in water and weak nitric acid. He says: As in the filtrates there is more acid than base, I pour one-fourth ammonia into a large, wide-necked flask and add, then, at once both the acid and the ammoniacal filtrates. There appears, either at once or in a short time—preferably at once—a separation of molybdic acid in fine crystalline needles. It is absolutely pure. When the flask is nearly full I render it almost neutral, allow it to settle, filter it through a bag or filter, wash it once (not more often, as the molybdic acid is otherwise redissolved) and press the precipitate slightly. I then dissolve in it a minimum of ammonia (whereby it becomes strongly heated), filter it quickly from the impurities (silica and magnesia) and reduce the filtrate with water to the specific gravity of 1.11 at 17°. Such a solution contains per litre exactly 150 grms. ammonium molybdate. I pour it into 1 litre nitric acid of specific gravity 1.2 (made up of 400 c. c. nitric acid of specific gravity 1.4 and 600 c. c. water) and allow it to stand for a day, so that traces of phosphoric acid may deposit as a yellow precipitate. The solution decanted off is absolutely pure. I have worked for a quarter of a year with such solutions

without having ever encountered differences with the official experimental stations. This procedure is simpler than any other, and the quantities of molybdic acid which may be dissolved in the washing waters are very unimportant. I once worked up about 100 litres of washing waters for molybdic acid and obtained only a few grammes of very impure molybdic acid.

**Unexplored Geographical Fields.**—As among the more important fields where special geographical research may still be profitably carried on, Mr. Clements R. Markham, as quoted in the "Popular Science Monthly," mentions the north polar area, a vast extent of which is unknown; the south polar area, of which this is still more the case; and plenty of interesting work still in Europe itself. Even in the British island some of the lakes were unexplored, and were not systematically sounded until the work was begun in Cumberland in 1893. The topography of the Alps might be considered fairly complete, but there are still physical inquiries of great interest that commend themselves to scientific Alpine travelers; such as the extent and action of ice, the oscillations of glaciers, the origin of the Föhn wind, and the effects of the destruction of forests. The historical geography of the Alps is also in process of elucidation. At present there are only three regions—in Africa—of considerable area, which offer opportunities for discovery on a large scale: namely, the Sahara, the region adjoining it to the south and extending across Wadai to the watersheds of the Congo and Nile, and the region to east of the upper Nile, stretching south of Abyssinia, through the lands of the Gallas and Somalis, to the eastern seaboard of the continent. Outside the regions referred to we might be said to have obtained a fair knowledge of the general geographical features of the African continent. Much detail remains to be filled in, and much of the work executed in a hasty and superficial manner requires to be done over again. There are also regions of great interest that have been visited, but which would well repay detailed examination. In the continent of Asia British and Russian geographers have been very active during the present century. Perhaps the most interesting and important unknown Asiatic region is the southern part of Arabia, from Yemen on the west to Oman of the east, and between the seacoast and the states of Nejd in the interior. Hadramaut, with its lofty mountains and cultivated ravines, its settled population and historic past, is almost a sealed book to us. The exploration of this district is about to be undertaken. Much work is yet to be done in Asia Minor. The most important unexplored field includes the upper valley of Euphrates and eastern Capadocia.

#### PATENTS RELATING TO MINING AND METALLURGY.

United States.

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

TUESDAY, DECEMBER 11TH, 1894.

- 550,508. Gas Engine. Henry T. Dawson, Salcombe, England. Combination of a combustion chamber, a furnace chamber containing refractory material, means for supplying gas to such a furnace and burning it among the refractory material within said furnace chamber, and an ignition valve between the combustion chamber and the holder, such valve opening inwardly into the furnace chamber, and permitting a portion of the charge to penetrate among the highly heated refractory material.
- 530,510, 530,511, 530,512. Mining Drill. Robert H. Elliott, Birmingham, and John H. Carrington, Jasper, Ala. Combination with a revolving wing or cutter and means for moving the same through an angle axially, of an auger for removing the chips or cuttings, and a reciprocating block adapted to push said chips toward said auger.
- 530,523. Gas Engine. Fedor Hirsch, Steinway, N. Y. Combination of two power cylinders axially out of line; a central trunk section having a chamber uniting the inner ends of said power cylinders and formed with a gas supply passage having an induction valve and igniter, and with a discharge passage containing an exhaust valve operated intermittently and positively by a cam upon the cam shaft of the engine.
- 530,612. Ore Pulverizing and Amalgamating Mill. John W. Bailey, Denver, Colo. Combination of opposing crushing surfaces, whereby the ore is pulverized, and an amalgamating device consisting of a metal plate, and a mercury trough, situated each on opposite sides of the space between the crushing surfaces, and electrically connected so as to form respectively anode and cathode.
- 530,639. Cold Sawing Apparatus. Heinrich Ehrhardt, Dusseldorf, Germany. Addition to the circular saw and frame of means of oscillating the saw across the direction of the feed.
- 530,662. Air Compressor. Henry C. Sergeant, Westfield, N. J., Assignor to the Ingersoll-Sergeant Drill Company, New York, N. Y. Combination of an upright compressor, a horizontal steam-engine cylinder and a piston therefor, a rotary shaft and a crank and flywheel thereon, a connecting rod, and a bell crank, one arm of which is connected directly with the rod of the compressor piston, and another arm of which is connected in one direction with the engine piston rod and also connected in the opposite direction by means of a connecting rod with the crank on the rotary shaft.
- 530,675. Dredging Machine. John A. Ball, Grass Valley, Cal. A swinging hull carrying dredging machinery, in combination with an anchored bridge frame to which said hull is pivotally connected.
- 530,677. Gold Separator and Extractor. John B. Beltgar and Jacob Schwartz, Albuquerque, N. M. Combination with the frame and hopper of the breaker or crusher thereon, revolving drive-shafts, crank arms and gears mounted thereon, vertical and horizontal shafts journaled alongside the frame, gears mounted thereon, short vertical shaft carrying crank arms and gears, air chamber having double bellows, adjustable connections between the drive shaft and one of the bellows, connection between the bellows, raffle-plate carrying a screen and means for connecting the plate to the air chamber, and movable supporting rods which permit the raffle-plate to have a horizontal rotary motion.
- 530,698. Block or Briquette of Fuel. Thomas W. Lee, London, England. The process consists in intimately mixing in the dry state powdered carbonaceous fuel with a binding agent composed of organic material and caustic alkaline material, subjecting the mixture to the direct action of steam, and compressing the mixture while in a moist and heated condition into blocks or briquettes.
- 530,719. Process of Making Plates, Etc., of Combined Metals. Adolf Rodig, Saahand, Germany. The method consists in placing the two metal blanks back to back, forming about the combined blanks a shell of a relatively softer metal, and then reducing and separating the compound blank thus formed.
- 530,753. Method of Recovering Concentrates and Apparatus for Carrying out Said Method. John S. Dougherty, Anaconda, Mont. Assignor to Marcus Daly, same place. Combination with a series of tanks of a flume which extends along said tanks, a gate between said flume and one of the tanks and a gate in said flume adjacent to the gate between flume and tank.
- 530,802. Steam Turbine Wheel. Eberhard Seger, Stockholm, Sweden. Combination of a wheel-body, the ring of which at its both edges has notches cut out obliquely and converging toward each other, and of curved paddle-blanks, which at their lower ends have a notch and flaps adapted to be inserted into the notches in the ring of the wheel.

## PERSONAL.

Mr. W. A. Clark, of Montana, has recently been in Arizona inspecting the New Verde copper mine. Mr. Clark left Arizona for New York on his way to Europe.

Mr. Ernst Prochaska, recently of Birmingham, Ala., has been appointed superintendent of the open-hearth department of the Otis Steel Company, of Cleveland, O., succeeding Mr. Luetscher.

Karl Mannesmann, one of the four sons of the late Reinhard Mannesmann, has arrived in this country to aid in the building of the tube plant which is being put up at Hartford, Conn., on the Mannesmann system.

Mr. Roger Prendergast, superintendent of the Sierra Nevada mine on the Comstock lode, who went to Europe for his health last spring, returned to Virginia City last week fully restored to health and ready to resume his duties.

Mr. John McBride, president of the United Mine Workers' Association, was elected president of the National Federation of Labor at the convention in Indianapolis this week. Mr. McBride received a considerable majority over Samuel Gompers, the present incumbent of the office.

Mr. G. L. Luetscher has resigned his position as superintendent of the open-hearth department of the Otis Steel Company to assume the management of the Granite City Steel Company, of Granite City, near East St. Louis, Ill. The company will have three basic and one acid open-hearth furnace, a blooming mill, plate mill and sheet mills, to be completed by June next. It is controlled by the St. Louis Stamping Company.

Mr. E. C. Engelhardt, a well known metallurgist of Denver, has gone to Prescott, Ariz., to make arrangements for the erection of a mill at that point, where he will treat ores by the bromine process, the details of which he has arranged. An experimental use of this process has proved successful with ores from a number of mining districts, and the company with which Mr. Engelhardt is connected expect to erect mills at several points.

Mr. Erskine Ramsey, who has been with the Tennessee Coal, Iron and Railroad Company for some time as mining engineer, and was recently made superintendent of the Pratt City mines, has just received another promotion, having been appointed chief mining engineer for all the company's property in Alabama. He will also for the present retain the superintendency of the Pratt mines. Mr. Ramsey is still a young man, but has shown himself a capable engineer in the positions so far held by him.

Mr. Louis Janin, Jr., mining engineer, and at one time a member of the staff of the "Engineering and Mining Journal," arrived in Sydney, N. S. W., on November 15th, on his way to Victoria, where he is expected to make his headquarters either at Ballarat or Bendigo. Mr. Janin, on behalf of his clients, will make a complete survey of the Victorian mining districts, with special reference to the milling processes now in vogue, and will also visit the Western Australian goldfields. His object is the introduction of modern American methods, replacing the somewhat antiquated Australian processes. Mr. Janin has had much experience in the treatment of rebellious ores and has been a careful student. He expects, before returning to America, to visit the South African goldfields.

Mr. Calvin Pardee, who was chosen president of the Lehigh Coal and Navigation Company in place of the late Mr. E. B. Leisenring on December 15th, is an old and experienced man in the anthracite business, and may indeed be said to come from an anthracite family, since his father was one of the pioneers in the trade. The firm of A. Pardee & Co. has been in existence for over 50 years. It was founded by Ario Pardee and J. Gillingham Fell. Those two gentlemen remained the only members of the firm until Mr. Fell's death, when his son succeeded him. Later, on the death of Mr. Ario Pardee, he was succeeded in turn by his son Frank. Mr. Calvin Pardee was never a member of the original firm, but was for 21 years superintendent of its mines, and was a member of the late firm of Pardee, Sons & Co. and of Pardee Brothers & Co. He is now the sole representative of those firms, and has a high reputation as a business man and a careful financier.

## OBITUARY.

Wm. A. Loveland, one of the pioneers of Colorado, died in Denver, December 17th, aged 68 years. Born in Massachusetts, he went west at an early age with his parents, locating in Illinois. He served in the Mexican War, joined Walker's filibustering expedition to Nicaragua, lived five years in California and then returned to Illinois. In 1859 he joined the gold-hunters bound for Colorado. He was connected with Gould, Dillon, Ames and other Union Pacific magnates. In 1878 he was the Democratic candidate for Governor. He leaves a son in Chicago.

John C. Fall, who died in San Francisco, December 12th, aged 79 years, was one of the pioneers of California. He was born in Ohio, and went to the Pacific Coast very shortly after the gold discovery in California, where he established himself at first in Sacramento, but afterward in Marysville, where he built up a large business house. Almost ruined by the great floods of 1861, he went to Nevada and

settled in Unionville. He was at first in business there, but afterward went into mining, and was largely interested in the Arizona mine in Humboldt County, Nevada, which was for a time noted as a large producer. At one time Mr. Fall accumulated a considerable fortune, but the decline in Nevada mining and the depreciation in the value of silver caused the loss of nearly all his money, and at the age of 75 years he started out again, establishing himself at Wilcox, Ariz., where he met with moderate success, and recently returned to San Francisco. Mr. Fall was married three times. He leaves one surviving child, who is the wife of John H. Kinkead, formerly Governor of Nevada. He was a prominent member of the Society of California Pioneers.

## SOCIETIES AND TECHNICAL SCHOOLS.

American Institute of Electric Engineers.—The ninety-second meeting was held in New York, December 19th. A paper was presented by Mr. Ludwig Gutmann, of Chicago, on the "Production of Rotary Magnetic Fields by a Single Alternating Current." The paper was briefly discussed.

Canadian Society of Civil Engineers.—At the regular meeting in Montreal, December 20th, a paper on "The Resistance of Piles," by Henry F. Perley, was read. Discussion on Mr. Stewart's paper on "Building Railways Across Peat Bogs or Swamps" was concluded, and discussion on Mr. Hogg's paper on "Transportation on Our Inland Waterways and Canals" was continued. The question of arrangements for the annual meeting was discussed.

American Society of Civil Engineers.—In addition to the nomination heretofore made a number of members have nominated Mr. John F. Wallace as a candidate for the presidency of the Society for the ensuing year. Notice is given that the annual meeting will occur on Wednesday and Thursday, January 16th and 17th. A programme for the meeting will be sent out hereafter. The board of directors has appointed Messrs. Charles Warren Hunt, Chas. H. Myers and A. W. Trotter as a committee of arrangements for the meeting.

At the regular meeting at the Society's house in New York, December 5th, Mr. A. Fteley presided. A paper was read by Mr. John Thompson on "Platen Presses for Letter-Press, Printing, Embossing, Stamping, Cutting and Scouring." The paper was illustrated by numerous lantern slides, and was briefly discussed by the members present.

At the meeting on Wednesday evening, December 19th, a paper was read by Guy B. Waite on "Wind Bracing in High Buildings," also a paper by Prof. Mansfield Merriman on the "Strength and Weathering of Roofing Slate." Both papers were briefly discussed.

Montana Society of Civil Engineers.—At the regular meeting held in Helena, December 8th, a number of applications for membership were received. A ballot was taken and the following new members were declared elected: James H. Henley, of Helena; Malcolm M. Macdonald, Robert A. McArthur, Walter W. Pennington and Eugene Carroll, of Butte. By consent the order of proceedings was changed and the president stated that he had been attending to the duties of secretary during the absence of Mr. Foss in Arizona. Several letters were read and amendments to the by-laws were received and referred to be acted on at the annual meeting. Letters were received from Roy Stone, special agent of the Road Inquiry Section of the Department of Agriculture at Washington, offering to assist in any methods in the matter of road improvement and stating that some action would be taken in a number of cities this winter. Prof. A. M. Ryon, owing to his absence in New York, was unable to present his corrected report on water measurement. The report, however, will be printed and sent out and will come up for action at the annual meeting. The committee on County Surveyor and Road Laws presented a letter with a draft of the proposed amendments to the present statutes of Montana. This subject was discussed by all the members present and it was ordered that as soon as the report of the committee is completed copy should be printed and sent to all the members to facilitate discussion and the final preparation of the bill to be submitted.

Geological Society of America.—As briefly noted last week, the winter meeting of the Society will be held in Baltimore, Md., beginning December 27th. The sessions will be held in the geological laboratory of the Johns Hopkins University. Hotel headquarters will be at the Hotel Rennett, on Saratoga street, where arrangements have been made for reduced prices for members. The proceedings will be varied on Thursday evening, December 27th, by a social assembly to which the members of the society are invited by the Johns Hopkins University. The presidential address will be given on Friday evening, December 28th, and will probably be followed by the annual dinner. The list of papers offered for this meeting is as follows: "Observations on the Glacial Phenomena of Newfoundland, Labrador and Southern Greenland," by G. Frederick Wright, of Oberlin, O.; "Highland Level Gravels in Northern New England," by C. H. Hitchcock, of Hanover, N. H.; "Discrimination of Glacial Accumulation and Invasion," by Warren Upham, of Somerville, Mass.; "The Marginal Development of the Miocene in Eastern New Jersey," by William B. Clark, of Baltimore, Md.; "Sedimentary Geology of the Baltimore Region," by N. H. Darton, of Washington, D. C.; "The Surface

Formation of Southern New Jersey," by Rollin D. Salisbury, of Chicago, Ill.; "The Crystalline Limestones, Ophiolites, and Associated Schists of the Eastern Adirondacks," by J. F. Kemp, of New York; "The Granites of Pike's Peak, Colorado," by Edward B. Mathews, of Baltimore, Md.; "Geology of the Highwood Mountains, Montana," by Walter H. Weed, Washington, D. C., and Louis V. Pirsson, New Haven, Conn.; "On Certain Peculiar Features in the Joining and Veining of the Lower Silurian Limestones near Cumberland Gap, Tenn.," by N. S. Shaler, Cambridge, Mass.; "Genesis and Structure of the Ozark Uplift," by Charles R. Keyes, Des Moines, Iowa; "The Appalachian Type of Folding in the White Mountain Range, of Inyo County, Cal.," by Chas. D. Walcott, Washington, D. C.; "The Geographical Evolution of Cuba," by J. W. Spencer, Washington, D. C.; "The Faults of Chazy Township, Clinton County, N. Y.," by H. P. Cushing, Cleveland, O.; "On the Honeycombed Limestones in the Bottom of Lake Huron," by Robert Bell, Ottawa, Can.; "Crystallized Slags from Copper Smelting," by Alfred C. Lane, Houghton, Mich.; "Spherulitic Volcanics at North Haven, Me.," by W. S. Bayley, Waterville, Me.; "The Peripheral Phases of the Great Gabbro Mass of Northeastern Minnesota," by W. S. Bayley, Waterville, Me.; "The Relation of Grain to Distance from Margin in Certain Rocks," by Alfred C. Lane, Houghton, Mich.; "The Cretaceous Deposits of the Northern Half of the Atlantic Coastal Plain," by William B. Clark, Baltimore, Md.; "Climatic Conditions Shown by North American Interglacial Deposits," by Warren Upham, Somerville, Mass.; "A Further Contribution to our Knowledge of the Laurentian," by Frank D. Adams, Montreal, Can.; "The Contact Phenomena at Pigeon Point, Minn.," by W. S. Bayley, Waterville, Me.; "On Some Dykes Containing Huronite," by Alfred E. Barlow, Ottawa, Can.; "On the Quartz-keratophyre and its Associated Rocks of the Baraboo Bluffs, Wis.," by Samuel Weidman, Madison, Wis.; "The Pre-Cambrian Floor in the Northwestern States," by C. W. Hall, Minneapolis, Minn.; "Lower Cambrian Rocks in Eastern California," by Charles D. Walcott, Washington.

## INDUSTRIAL NOTES.

The Oakland Iron Works in Oakland, Cal., which were recently destroyed by fire, are being rebuilt on a more extensive scale than heretofore.

The Berlin Iron Bridge Company, of East Berlin, Conn., has just completed a new boiler house for the Metropolitan Electric Company, at Reading, Pa.

Messrs. Farist & Windsor, of Bridgeport, Conn., have purchased at receiver's sale the plant of the Windsor Locks Steel Company, at Windsor Locks, Conn. The price paid was \$19,900.

The "Woodbury" concentrator is being put in at the Hathaway mine at New Castle, Placer County, Cal.; at the Wm. P. Millis mill at Middlebrook, Shasta County, Cal., and in the Osborn Hill mill at Grass Valley, Cal.

The Ross-Meehan Brake Shoe Company, of Chattanooga, Tenn., has petitioned in the United States Circuit Court for a receiver to wind up the affairs of the Southern Malleable Iron Works, manufacturers of the Hinson car coupler.

The sale of the Wellman Iron and Steel Works at Chester, Pa., has been postponed until January 10th, on the guarantee being given by the unsecured creditors that they would make a bid higher than the bonded and secured debt. In evidence of good faith they have given security in the sum of \$20,000.

The White River Iron and Steel Company's works at Muncie, Ind., were sold December 5th by Receiver Caleyron to T. F. Rose, of Muncie, for \$16,200. The creditors have begun suit to set aside the sale and are proceeding against Receiver Caleyron, alleging that he needlessly incurred a heavy indebtedness as receiver.

The general tendency to reduce expenses in the handling of material is shown by the Lowell Bleachery and Dye Works, of Lowell, Mass., which is installing a complete system of cars and track for handling coal. In the boiler-room it will lay cast plate track, which is to be of the standard gauge, 21½ in., of the C. W. Hunt Company, New York.

The Fulton Iron Works, of San Francisco, was notified Dec. 7 that its bid to erect a plant at the Presidio, United States government military station at San Francisco, to operate pneumatic guns, had been accepted and contract signed. The plant will consist of two duplex machines, six cylinders each, for compressing air up to 2,000 lbs. per square inch, boilers and electric light plant.

The Naugatuck Malleable Iron Company, at Naugatuck, Conn., has placed a contract with the Berlin Iron Bridge Company for a new annealing room. The building will be 94 ft. wide and 175 ft. long, entirely of fireproof construction. The Berlin Company is also building a new roof for the gas-house of the Massachusetts Reformatory, at Concord, Mass., and is furnishing the ironwork for the new office building of the Pope Manufacturing Company, at Hartford, Conn.

H. D. Morris & Co., of San Francisco, are putting machinery in the following mines: Gold Valley mine, Downieville, Cal., a 12 x 16 duplex compressor water power, built by the Rand Drill Com-

pany; Alma Gold Mining Company, Jackson, Cal., a 12 x 16 steam power compressor, built by the Rand Drill Company; and the Morning Star mine, Battle Mountain, Nev., a 10 x 16 x 16 steam compressor, 8-in. cylinders, 60 x 60 boilers complete with pumps, heater, condenser, etc.

The plant of the Morton Tin Plate Company, Cambridge, O., is nearly completed. The works consist of three stands of hot rolls, 24 x 32 in., and three stands of cold rolls 20 x 32 in., with the necessary doubling and trimming shears, pickling machine, etc. If no accident interferes, the works will begin to make black plates about the end of December. Work upon the tinning-house has not yet been begun, but plans have been made and the building will be erected very soon.

The A. & P. Roberts Company has been organized in Philadelphia to manufacture iron, steel and other structures. The capital stock is \$1,000,000, divided into 10,000 shares, of which 9,000 are issued to Percival Roberts in payment for the Pencoyd Iron Works and other properties. The company is a reorganization of the old firm of A. & P. Roberts, which has for so many years successfully operated the Pencoyd Iron Works at Pencoyd, near Philadelphia, and which has become widely known as a manufacturer of bridges, buildings and all kinds of structures of iron and steel. The directors of the new company are Percival Roberts, Percival Roberts, Jr., and P. Williamson Roberts.

The increase in business done by the General Electric Company has necessitated an extension of the already large facilities at Schenectady, and two buildings are now being constructed by Grattan & Jennings, contractors. One of these is a storehouse 353 ft. long and 52 ft. wide. The foundations are already laid and the superstructure is rising rapidly. This will relieve the smaller storehouses, now found entirely inadequate. The other building will be used as a laboratory for standardizing. It will be erected on the very outskirts of the tract of land owned by the company at Schenectady, in order that it may be far as away as possible from the disturbing influences of moving iron and heavy electric currents in and around the many buildings of the plant proper. This laboratory will contain all the standard instruments of the company, and with these the working instruments, which are in use throughout the factories for testing purposes, will be compared each day.

The latest catalogue received from Fraser & Chalmers, of Chicago and London, is No. 9—"Concentration Machinery." Like most of their series of catalogues this is a very complete one and includes not only descriptions and illustrations of concentrating machinery of different kinds manufactured by this company, but also a short preliminary chapter on the general subject of the concentration of ore and a number of plans illustrating the arrangement of works adapted to different classes of ores and different localities. The latter will be a very great convenience to mine owners and engineers who have to design such works. In addition to this catalogue we have received a special sheet containing a description of ore sampling machinery, manufactured by the company, including the Collom sampler, a sample grinder, McDermott's automatic sampler and a pipe sampler. They have also issued a sheet giving the specification of the Austin patent for pyritic smelting. The company's list of machinery and the number of their catalogues have grown so that they have been obliged to issue a general index. In this will be found the different classes of machinery with references to the number and letter of the catalogue, as well as to the page on which it will be found. This index will be of great convenience in sending for the fuller catalogues which intending purchasers may need to order machinery.

We noticed in the "Journal" some time ago the excellent qualities of the Truax automatic ore cars made by the Truax Manufacturing Company, of Denver, Colo. By a very ingenious improvement in this car the lever in the back with all its disadvantages is done away with. The car cannot be dumped without opening the door gradually, as the door does not commence to open until the bed of the car is at an angle of 40° from the track, and from that on until the bed of the car is at an angle of 12°. The door is held by two catches and a crossbar. When the catches start to take hold of the door the bed of the car is at an angle of 12°, and from that time until it is closed it acts on the wedge principally making a tight fit between the door and the body of the car. As the door will hold the ore until the car is partially dumped the trucks can be set further toward the door end, making a much easier dump than the ordinary cars and distributing the wear on the axles more equally. The catch and step are made of malleable iron in one solid piece, and are attached with a bolt through the truck frame so that by taking out the bolt the step comes out, affording easy access to the spring. The car body is swiveled so that it can be dumped on either side as well as in the front. The car body is made of steel, but where required a false bottom, made of 1-in. plank, covered with steel, is fitted. The usual gauge is 18 ins. Recently a great improvement was made in the construction of these cars. It was found that in some cases the cross hinge bar used on top of the car was a disadvantage, as it would occasionally bend when struck by large lumps of ore. A new arrangement for which a patent is pending obviates this by adding an indestructible hinge, which gives additiona

strength and at the same time leaves the top of the car unobstructed, so that it can be used for carrying timber and other articles as well as ore. The car certainly seems to be excellently adapted to its purpose, and extensive use in many different localities has proved its advantages.

#### MACHINERY AND SUPPLIES WANTED.

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

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

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

#### GENERAL MINING NEWS.

The Bureau of Statistics, Treasury Department, reports the total exports of mineral oils from the United States in November at 76,955,416 gals., a decrease of 1,277,935 gals., or 1.7%, from November of last year. For the 11 months ending November 30th the exports were: Crude oil, 106,127,833 gals.; naphtha, 13,266,682 gals.; illuminating oils, 656,682,973 gals.; lubricating oils and paraffine, 35,635,289 gals.; residuum, 59,262 gals.; total, 811,802,039 gals., showing an increase of 9,322,557 gals., or 1.2%, as compared with the corresponding period last year.

The agreement between the New England Granite Manufacturers' Association and the Granite Cutters' National Union, made to terminate the long lockout of 1892, terminates by expiration March 1st next. By its terms either party desiring it changed at that time must had to three months' notice of the modification desired. At the meeting of the Manufacturers' Association, held recently at Quincy, Mass., it was voted to give the required notice, and adopt a uniform standard of wages of 29¢ c. an hour, nine hours a day. This is said to be a reduction in some places and an increase in others. Its adoption is left optional with local associations.

#### ARIZONA.

##### Yavapai County.

Eureka District.—This new district is on the Santa Maria River, in the southwestern corner of the county. It is a gold district, and so far as developed the ore is strictly free milling and in large veins, carrying from 2 to 8 ft. of quartz, usually low grade. The Santa Maria River runs through the center of the district. It carries enough water to run stamp mills by such power for at least nine months in the year, and there is always plenty of water to run mills by steam.

##### Yuma County.

Harqua Hala Gold Mining Company, Limited.—The following is the estimated return for the month of November: Crushed during the month, 3,235 tons; estimated gross value of gold produced, \$27,200; miscellaneous revenue, \$500; total revenue, \$27,700. The estimated total expenses were \$12,600, leaving an estimated profit for the month of \$15,100.

#### CALIFORNIA.

##### Nevada County.

Mayflower Quartz Mine.—This property, on Canada Hill, owned by Robert Martin and others, has been sold for \$50,000 to C. D. Lane, of Caleveras County, who represents a party of capitalists who have been negotiating for the purchase of the mine for some time.

North Star Mining Company.—A suit has been begun by Martin Ford and the Carson City Mining Company, a corporation of the State of Nevada, against the North Star Company to recover \$850,000, the alleged value of ore taken from the Irish-American mine. The court is also asked to eject the defendant company from the Irish-American property. The suit is in the United States Circuit Court, and involves a number of important questions.

#### COLORADO.

##### El Paso County.

Pharmacist Mining Company.—This company has issued a circular to its stockholders asking for a voluntary assessment of 1c. per share, to be paid in on or before January 1st, 1895. The circular sets forth that the company is in debt about \$10,000, which must be paid. The assessment, if all respond, will furnish \$12,000. The stockholders contributing will be given company notes bearing 8% interest, secured by a trust deed on the property.

##### El Paso County—Cripple Creek.

(From our Special Correspondent.)

American Eagles 1, 2 and 3.—These claims have shipped four cars of ore this week to Pueblo. This property will soon rank among the best in the camp. Two shafts are being worked, one at a depth of 50 ft.; the No. 2 shaft less than 30 ft.

Anaconda.—These properties on Gold Hill are steadily improving both in grade of ore and quantity. Considerable prospecting is being done on some dozen of the claims, and the results are by no means disappointing. The suits pending against

the Grace Greenwood claim were settled several weeks ago, and now the Anaconda has fair sailing.

Big Banta.—This property is owned by the Areqa Mining and Milling Company, with head office at Canyon City, and is under lease to Mr. Ed. de la Vergne, who in sinking 35 ft. has taken out from a 4-ft. vein 60 tons of ore; the first 20 tons assayed \$36, and the 40 tons now on the road to the smelter will average \$40. It was the intention of the lessee to cut a station at this point in the shaft, but the ground was so broken he deemed it policy to sink 7 ft. before starting levels. The claim is situated on the north slope of Battle Mountain.

Blue Bird.—This claim on Bull Hill is worked under lease by Dr. Burdick, one of the owners. The first car assayed 7 oz. and the next 12 oz., and another car will soon be on the road to smelter. The new shaft on the Phonolite dike is improving. At about 10 ft. deep the dike assayed \$4; at the depth of 28 ft. it assays \$13.

Climax No. 1.—This claim made its first shipment to smelter this week. The vein in the tunnel shows an improvement. With the advent of a shipper on the southwest slope of Squaw Mountain attention will be called thereto.

Grace Greenwood.—This mine, owned by P. L. Kimberly, a large iron miner and manufacturer in Pennsylvania, is being worked by eight men, who are now drifting on what was formerly known as the Napoleon, but thus far no shipments have been made. The north end of the Grace Greenwood has been leased.

John A. Logan.—This claim on Bull Hill is being worked on an extensive scale, or preparations to that effect are being made. The shaft has been sunk 55 ft.; it is 5 x 8 ft. in the clear. A shaft-house 35 x 75 ft. is almost completed. It was the intention to put in a 40-H. P. plant. Now orders have been given for an 80-H. P. boiler and engine.

Lucky Cuss.—One of the claims owned by the Wilson Creek Consolidated Mining and Milling Company, and worked under lease by Messrs. Estey & Mudd, well known mining men of Leadville, is situated on the south slope of Bull Hill. A shaft has been sunk on the west end of the claim to a depth of 75 ft., and a drift is being extended south in hopes of striking a well-known vein. The pay streak in the Lucky Cuss is from 1 to 4 in., composed largely of mud and broken fragments of crystallized quartz, and assays from 10 to 50 oz.; the balance of the vein is fairly good milling ore.

Mollie Kathleen.—This claim on Tenderfoot Hill, a little east of the town of Cripple Creek, has somewhat astonished the camp this week. The property has been leased and bonded by several different parties who always threw it up as the bond was rather extortionate, but the owner would not concede a point. This week the owner went over the ground, and discovered a 3-ft. vein at surface, a 50-lb. sample of which gave \$60 per ton. The vein where discovered is within 50 ft. of the most traversed road in the camp, and there are three shafts within an area of 75 ft. The ore by sorting gives a value of \$100.

Pharmacist.—The shaft has been sunk to a depth of 425 ft. at an angle of 50°. About 12 men are employed. This mine has recently been examined by Mr. Edward Skewes for one of the large stockholders. It is reported that the shaft has much improved, carrying telluride of gold.

Portland Mining Company.—This company, on Battle Mountain, are still the principal shippers of the camp. The Portland shaft has been sunk 250 ft., and the number of men employed is close to 100. This is still the best property owned by the company. Bob-Tail is self-supporting, but as yet there has not been much profit. Anna Lee shaft is 450 ft. deep, and the grade of ore in the ore shoot averages from 7 to 8 oz. Scranton, on which a steam hoist has recently been erected, is doing well, but no stopping ground has yet been opened, but will about the commencement of the year.

Theresa.—This claim, situated on an outlier of Bull Hill, has shipped 65 tons from its 25-ft. shaft. The first shipment gave over 3½ oz. of gold, and the present shipment is supposed to yield 4 oz. This property is under lease and bond to Colorado Springs people.

Victor.—The output for November was over \$42,000, the greatest in the history of the mine. The expense account about \$8,000. The new vein is strictly first class. The tonnage of ore, 130 tons.

##### Gilpin County.

Springdale Gold Mining and Milling Company.—This company, our London correspondent writes, has acquired, on the advice of Mr. A. L. Pearce, eight more claims in Pine Creek, eight miles from Central City, Colo. Mr. Pearce was not very favorably impressed with the Telluride property with which the company started operations before he became their adviser, and he has accordingly seized the first opportunity of strengthening the position of the shareholders.

##### Lake County—Leadville.

(From our Special Correspondent.)

The present output is 1,400 to 1,500 tons daily from the mines of the camp. This is a heavy increase over the same month last year, and also over 150 tons daily more than was mined during November of this year.

Doris.—It is learned to-day that these people have also encountered a good gold ore body, but

the full extent of the find has not yet been given out, neither any of the assays. This property is also located in Iowa gulch.

First National.—Metcalf & Evans have just leased this property for three years. There is a large body of rich ore in the old workings which is to be developed. The ore runs 2 oz. gold and 16 oz. silver. The shaft will be sent down 140 ft. to the contact.

Lillian.—The new lessees on this property, who discovered a rich body of ore after working only 12 ft. on the old Carnahan incline, have just settled for their first shipment of 200 tons. The returns were 5 to 8½ oz. gold, 100 to 160 oz. silver, and 40% excess iron to the ton.

Rex Mining Company.—On Friday night these people made one of the most important strikes of the year. After sinking 200 ft. they met with water, so determined to send down the diamond drill; and this at a farther depth of 150 ft. encountered the mineral. It proved to be gold ore and the drill went through over 36 ft. of this stuff. Beneath this gold ore body a body of fine lead ore was also encountered. The strike is of the utmost importance and mining men are very jubilant. The Rex is 2¼ miles from Leadville on the north slope of Long & Derry hill, being about 500 ft. south of Iowa gulch and just east of the Mike fault. Messrs. J. J. Brown and L. D. Rudebush are at the head of the Rex and the shaft is to be sent down at once to the gold ore body.

Smith-Moffat Combination.—The output for November was: Orion lease, 213 tons carbonate; Bon Air, 49 tons iron; Grey Eagle, 2,935 tons iron and 262 tons carbonate; Wolfstone, 980 tons sulphide; Maid & Henriett, 364 tons sulphide; Dennison lease, 1,130 tons carbonate; Lower Henriett, 2,118 tons carbonate; Louisville, 223 tons sulphide; other lessees, 980 tons. This output shows a large increase over October, due to the opening up of immense ore bodies in the Lower Henriett and important development in the Dennison and Wolfstone.

#### Park County.

Lone Jack Mining Company.—This company has been organized by Albert Sherwin, J. A. Ewing and James Campbell to operate mines in this county. The capital stock is \$1,000,000, and the office is in Denver.

#### Pitkin County.

St. Joe & Mineral Farm Mining Company.—The directors of this company met in Aspen, December 13th, and decided upon the proposition of consolidation with the Pontiac and Champion-Empire companies, to be submitted to the stockholders at a special meeting called for December 16th. The proposition is that the new company shall be capitalized for \$3,000,000 in \$1 shares, 1,000,000 shares to be treasury stock. Of the remaining 2,000,000 the St. Joe & Mineral Farm is to receive 50%, the Pontiac 33%, and the Champion-Empire 16%. It is intended to put the treasury stock up to 25c. or more to raise money for development, etc., in case the consolidation is effected.

#### CONNECTICUT.

##### Middlesex County.

Joshua Rock Quarry.—This quarry, on the Connecticut River, near Essex, has resumed operations after a stoppage of a year, and the facilities are to be extended considerably.

Sachem's Head Quarry.—The firm of Hughes Brothers, of Syracuse, N. Y., have bought 13 acres of the Benton quarry land at this point. They propose to take out stone for a breakwater.

#### GEORGIA.

##### Lumpkin County.

(From our Traveling Correspondent.)

Calhoun Mine.—This mine, owned by the North Georgia Agricultural College, is the location of the first discovery of gold in Georgia, in 1827. The discoverer who was named Benjamin Parks, is living to-day near Dahlonega. This mine is located on the south side of the Chestatee River, about 2½ miles due south from Dahlonega. At the present time it is idle, but arrangements are being made to operate it in the near future. The property consists of 444 acres of land, with the Chestatee River flowing through it, and forming the western boundary for nearly one mile. This property was purchased about 1830 by Senator John C. Calhoun, who took out, it is claimed, a large amount from placer diggings on the property.

Chestatee Pyrite Company, of Atlanta, Ga.—This company is operating the old copper property on the banks of the Chestatee River, about six miles southeast of Dahlonega. About 300 tons of pyrites have been mined, and 200 shipped to Atlanta by wagon haul, 20 miles to Gainesville, thence by rail. The cost for freight at present is about \$4 a ton. This pyrite is being tested at the acid plant of the Scott Manufacturing Company, which has purchased the mine. I am informed by the superintendent at the mines that the ore carries 52% sulphur, and traces of copper and arsenic. If this is the case, and the quantity of ore is sufficient, there is a probability of the building of a line of railroad either from Gainesville or else from Atlanta direct, to Dahlonega. By this latter route the mileage would be 65 miles, following a ridge nearly the entire distance, from Dahlonega to Peach Tree Creek, where a connection would be made with the Seaboard Air Line system. The work performed at the mine consists of 7 diamond drill holes, the deepest 90

ft. bored on an incline into the ridge on which the pyrite occurs. It is claimed that solid pyrite was bored into in all of these, but it is considered probable that the body encountered is not the same as is being mined, but probably a stratum occurring higher. A crosscut tunnel has been also driven at the base of the hill in which a solid body of pyrite is exposed nearly 33 ft. thick, or rather two bodies, because a stratum of hornblende slate about 6 in. thick was cut through about 20 ft. from where the tunnel first exposed pyrite ore. The country rock is hornblende slate, with northwest and southeast line of strike and southeasterly dip. This hornblende gives place to gneiss both to northwest and southeast. which latter rock also forms immense shoals in the Chestatee River at this point. In the crosscut the depth from the outcrop is some 20 ft., and except in the diamond drill holes this is the greatest depth attained. The indications on the surface are favorable for the maintenance of continuity along the line of strike for a considerable distance. But sufficient work has not been done to base an opinion as to permanency and extent. Of course the value depends entirely on the percentage of sulphur, and freedom from arsenic in the ore—47% sulphur is the lowest grade ore desirable for treatment in the acid plants, because lower than that renders the maintenance of the fires without fuel very difficult; while arsenic is very injurious to the lead vats. The progress of the development of this property is watched with great interest by the fertilizer manufacturers; because it is, so far as at present known, the only body of pyrite south of North Carolina which possesses the requisite qualities for treatment in the acid plants, as they are to-day arranged. Some occurrences of slate carrying pyrite in small crystals, which aggregate from 50 to 75% of the entire mass and assay 51% sulphur, occur in both Georgia and Alabama. But in order to treat such the furnaces would have to be rebuilt, or rather altered. Such alterations would cost from \$2,000 to \$3,000 for each furnace.

#### Paulding County.

(From an Occasional Correspondent.)

Mr. Courtis, who is operating mines at Yorkville, has met with a body of fine quartz in the main tunnel, going down below the tunnel the full width of the opening. Some parts of the ore show free gold, and a good deal of tetradymite, which is rich in gold in this mine. All of the rock pans splendidly. Orders have been given to cross-cut this body when the tunnel connection is completed.

#### IDAHO.

##### Owyhee County.

De Lamar Mining Company, Limited.—The following is the estimated return for the month of November: Ore crushed during the month, 3,528 tons; bullion produced in the mill, \$67,270; estimated value of shipping ore, \$10,000; miscellaneous revenue, \$930; total revenue, \$78,200. The total expenses were \$37,013, leaving the estimated profit for the month \$41,187. Notice is again given that, in accordance with circular dated November 30th, the company is now prepared to receive applications for exchange of registered shares to share warrants to bearer. The warrants will be of the value of 10 shares, five shares and one share each respectively, but the issue of warrants of five shares each will be limited to an amount not greater than 20% of the total amount applied for by any applicant, and warrants for one share each will only be issued for the purpose of completing broken amounts. The equivalent of the stamp duty of 30s. per 100 shares will be payable in cash to the company, together with issue fees per share warrant, according to the following rearranged scale: Warrants for 10 shares, 1s. per warrant; for five shares, 6d. per warrant; for one share, 3d. per warrant. Forms of application and all information relating to the issue can be obtained at the company's offices, No. 6 Drapers' Gardens, London, E. C., England.

#### Shoshone County.

Our latest advices from the Coeur d'Alene region are that the Miners' Union is in complete control of the whole district. The Bunker Hill & Sullivan Company's mines continue shut down completely, and not even pumping nor other necessary work is allowed to be carried on. Some of the mines are still working, including the Tiger, the Gem and the Poorman, but the future even of these is entirely uncertain. The Union has announced its intention to permit no non-union man in the district and to adhere strictly to the \$3.50 per day rate. In the Morning mine at Mullan, Mr. Huntley continues at work under the co-operative plan, but there are rumors that the Union will force the abandonment of this interesting experiment. There has been no open violence recently, but the whole region is terrorized.

#### MAINE.

##### Kennebec County.

Fuller Granite Quarry.—The largest block of granite ever taken out of this quarry was cut out last week, and hauled down to the Maine Central yards, from which it will be shipped to Quincy, Mass. It weighs about 16 tons, and is stone of a very fine grain intended for a statue.

##### Knox County.

The lime business in Rockland and vicinity is even more quiet than is usual at this season. Local papers report that out of 103 kilns only 10 are in fire at present.

#### Washington County.

Eastern Maine Granite Company.—This company has been organized to operate the old Gilman-Drisko colliery, near Jonesboro, and also for the purpose of dressing and selling the stone. The officers of the company are W. P. Drisko, president, and R. L. Gilman, treasurer.

#### MASSACHUSETTS.

##### Essex County.

Rockport Granite Company.—This company has purchased the Canney quarry at Pigeon Cove. The property includes about 75 acres, with steam engine, drills and other machinery, a wharf and tugboat.

#### MINNESOTA.

##### Iron—Mesabi Range.

(From our Special Correspondent.)

Auburn.—The timber on this property is being cut and sawn at a Virginia mill. Extensive striping will be carried on during the summer on the cleared land.

Biwabik-Bessemer Company.—This company has paid \$14,000 of labor claims incurred under the contractors, Fitzgerald Bros. & Sisk, and is preparing to strip.

Canton.—This mine is nearly full of water from a heavy rush that drowned out the pumps last week.

Oliver.—Late in the navigation season the steam shovels and tracks in this mine were below water level. A pump shaft is being sunk between the two long cuts in the ore, and a very powerful pump will be put in. It is thought this will drain all the surface operations.

Roucheleau Ray Company.—This company has found excellent iron deposits in 26-57-17, part of which it recently sold to the Fayal Iron Company. The deposit is about five miles southeast of the Virginia deposits. The same company is negotiating for a lease of the Little Mesabi in 58-15, where some fairly good hard ore was found two years ago.

##### Iron—Vermilion Range.

(From our Special Correspondent.)

Chandler.—It is claimed that this mine has put its 1894 ore on stock at 60 cents, and there is good reason to believe it did at least as well as this.

##### Redwood County.

(From our Special Correspondent.)

The Minneapolis "Journal" has punctured a fraudulent gold mine in this county which was operated by the Minnesota Gold Mining and Refining Company, and owned by Minneapolis men. Numerous assays by one chemist showed large results, while others have been able to get nothing. The company was selling \$160,000 face value of stock on a 60% basis on a 20-ft. hole in the leanest kind of barren quartz.

#### MISSOURI.

##### Jasper County.

(From our Special Correspondent.)

##### Joplin, Dec. 17.

There was a general falling off of the production of lead and zinc ore during the past week. Prices for zinc ore were fairly well maintained through the week, but the purchasing agents predict that prices will drop this present week, as some of the zinc smelters will close down part of their blocks. Lead ore is still in an unsettled condition, with a downward tendency, the market closing at \$16@16.25 per thousand. Prediction was made Saturday that pig lead in St. Louis would go down to \$2.75 before it stopped. At the present time the Picher Lead Company works are entirely closed down, and are making repairs to their slag-eye furnaces. Capt. E. O. Barlett, the general manager of the works, is also laid up for repairs, as he met with a serious accident Saturday evening, caused by the running away of his horse. He was lately elected president of the Joplin Commercial Club for the ensuing year, and was inaugurated last Wednesday evening.

Following are the sales of ore from the different camps: Joplin, 1,112,358 lbs. of zinc ore and 314,630 lead, value \$15,358; Webb City, 597,720 lbs. of zinc ore and 48,700 lead, value \$6,298; Cartersville, 1,434,050 lbs. of zinc ore and 186,330 lead, value \$25,240; Oronago, 44,560 lbs. of lead ore, value \$704; Carhage, 125,890 lbs. of zinc ore, value \$1,258; Zincite, 107,130 lbs. of zinc ore and 3,710 lead, value \$10,024; Galena, Kan., 1,105,600 lbs. of zinc ore and 202,460 lead, value \$10,940; district's total value, \$59,564. Newton County, 422,450 lbs. of zinc ore and 97,990 lead, value \$5,392; Aurora, 1,032,090 lbs. of zinc ore and 172,100 lead, value \$10,365; Staats City, 87,810 lbs. of zinc ore, value \$812; lead and zinc belt's total value for the week, \$76,133.

There was an important deal consummated last week, which was the purchase of 100 acres of mineral land located in the city of Joplin, for the sum of \$15,000. Twenty acres of this land is known as the Snyder mines, from which over \$350,000 worth of zinc ore was produced in the years 1890, 1891 and 1892. Several hundred tons of this ore were shipped direct to Vivian & Sons, of Swansea, Wales, for treatment. The other 80 acres of the land has never been prospected, but is well located. The purchasers are Gen. John B. Sanborn and Thos. P. Wilson, of St. Paul, Minn.

## MONTANA.

## Jefferson County.

Elkhorn Mining Company, Limited.—The following is the return for the month of November: Mill worked 29 days and crushed 1,100 tons. Bullion produced in the mill, \$24,870; 94 tons of smelting ore sold, \$6,935; total produce, \$31,805. The total expenses were \$21,905, leaving an estimated profit for the month of \$9,900. The directors have declared an interim dividend of 9d. per share (free of income tax), for the quarter ending November 30th. Dividend warrants were posted from the London office on December 21st to all shareholders registered on the books December 6th.

(From our Special Correspondent.)

Diamond Hill Mining Company.—This company, office at Helena, has just brought in a 15 days run from a 5 ft. Huntington mill, which returned them from the U. S. Assay office \$5,005 gold. In addition to the present milling capacity the company has decided to put in stamps, a battery of five being now in place which will be dropping on the ore within a week. These will be added to as circumstances seem to warrant, and from present indications in the mine the probabilities are that a large plant will be required. The ore is free-milling gold, and the saving very close. A shipment of concentrates to the East Helena smelter of a number of tons returned only \$16.60. The highest assay of the tailings showed only 98c., and ran as low as 60c. per ton. This property was recently developed by a tunnel which lapped the ore at 125 ft. deep, the lead at this point being 43 ft. wide. A second tunnel will tap the ore 300 ft. deep. There will be no water to contend with under 350 ft. to 400 ft.

(From an Occasional Correspondent.)

Silent Friend.—This mine, which is situated on the Little Boulder, near Basin, has been bonded to Butte parties for the sum of \$40,000. The ore carries gold, silver and lead and has also shown some copper pyrites. The ore will be freighted to the railroad, a distance of about 15 miles, and then shipped to one of the smelters at Denver. The mine has been a steady producer for some time.

## Missoula County.

(From our Special Correspondent.)

Iron Mountain Mining Company.—The development in this mine has now reached a depth of 500 ft. below the hoist in the tunnel. The reserves of ore in sight warrant regular dividends for some time, and development in way of sinking continues with regularity, keeping the reserve intact. The gangue of the ore (serpentine) being very light, enables the mill to concentrate from 150 to 225 tons daily, furnishing an average of a carload of concentrates per day, which is shipped to Tacoma, Wash., averaging \$700 to \$900 per car. Value of concentrates is about 100 oz. silver and 40 to 50% lead. Force employed, 60 to 70 men. The dividends total to November 28th amounted to \$295,000. The last dividend, November 28th, was \$10,000. This is one of the best managed companies in Montana, and one of the few silver-lead properties that can pay dividends.

## Silver Bow County.

Butte & Boston Mining Company.—This company took a bond 18 months ago on the Blue Jay property in Butte, which was owned by the Thornton estate. The bond was for \$80,000, and the mine has since become one of the largest producers owned by the company. Last week the company lifted the bond and it is understood will proceed to make extensive improvements at once.

The following notes are from the Butte "Inter-Mountain" of recent date:

One of the latest rumors in the mining world is that a company has secured control of a number of very fine copper claims near the Estella and have also secured the old Boston & Montana smelters at Meaderville, with which to treat the ore they expect to mine in the near future.

Many of the stamp mills in this district which depend upon custom ore to keep them supplied are complaining of the scarcity of ore and unless a change for the better occurs very soon at least one of them will shut down. Some weeks ago the Lexington was compelled to close down owing to the fact that not enough oxidized ores could be obtained. There were a number of leasers operating silver properties during the summer and early part of the fall, but the most of them quit work about election time. Over in the western part of this and the Independent mining district there are a large number of leasers at work "gophering" around for rich pockets of silver ore, of which that locality has furnished much. This section is the coming silver belt of the county.

Anaconda Mining Company.—The Anaconda this year promises to beat its record of 1892, when it produced 100,000,000 lbs. of copper.

Lewisohn Mine.—Messrs Paschal & Darrow are renovating the old Lewisohn mine preparatory to working it. The Lewisohn adjoins the Ramsdell-Parrot, and the first shipments of ore will be hoisted through the latter shaft.

Ramsdell-Parrot.—Elmer Metcalf and W. H. Swett have secured a lease of the Ramsdell-Parrot, and will begin active operations very soon. This property is considered one of the richest in the district, and has been operated for a number of years. The leasers who formerly worked the ground left it in bad shape, and it was found that considerable labor would have to be expended in getting it into

proper shape. This is the same property which now figured in a suit for damages in the district court.

Washoe Copper Company.—The buildings in the vicinity of the new Washoe shaft, between Quartz and Copper streets, which are located on the Gold Hill property, have been vacated, and will be removed at once to give the company space for a dumping ground. The development of the new shaft is progressing rapidly, work having been commenced by steam power.

## NEVADA.

## Storey County—Comstock Lode.

The following are extracts from the latest weekly official letters of the mine superintendents:

Alpha.—The west drift on the 450 level has been advanced 6 ft., face in quartz and porphyry; total distance from shaft, 37 ft. Near the face we have started a north drift; face in clay and stringers of quartz.

Andes.—On the 420 level, west crosscut from the north lateral drift from the top of the upraise up 50 ft., advanced 15 ft.; total length, 127 ft. Formation, quartz and porphyry.

Belcher.—Repairs are still being made on the different levels of the mine, especially on the 1,000 and 1,100 levels. We have extracted during the week 28 tons of fair grade ore.

Best & Belcher.—On the 200 level the joint winze started in west crosscut No. 5, on our south boundary has been sunk 11 ft.; total length, 32 ft., passing through quartz. On the 800 level, at a point in the north drift 100 ft. from west crosscut No. 4, started west crosscut No. 5 in a face of quartz, and after extending some 10 ft. discontinued work, with the face in hard porphyry. From a point opposite to where this west crosscut No. 5 was started we have run an east crosscut in for a distance of 16 ft., passing through quartz.

Bullion.—The west drift from the Ward shaft 820 level, has been advanced 15 ft. during the week; total length 1,230 ft.; face in porphyry and clay, with a light flow of water from it.

Chollar.—The north winze from the 450 level has been sunk 15 ft. and is now down a total distance of 72 ft.; the bottom is in quartz considerably mixed on the north side with porphyry, yielding assays from \$10 to \$20 per ton. On the 500 level we have repaired the north lateral drift to the north line, and have started an east crosscut from it to connect with the winze from the 420 level. We estimate that it must go 20 ft. to the point of connection. We have saved from the winze and the old stopes on 450 level during the past week 70 tons, 1,100 lbs. of rich ore, which has been shipped to the Nevada mill for reduction. The average battery assay was \$29.07 per ton.

Consolidated California & Virginia.—On the 1,650 level we have continued to stope out ore from the new ore body, from the sixth floor up to the eleventh floor; and on the eleventh floor have advanced one set of timbers farther to the south in ore, making six sets in all, from north to south. The south face of the stope on the eleventh floor is in ore of fair quality, the top being in porphyry and quartz. We have extracted during the week from all openings 350 carloads, about 347 tons of ore, the average assay value of which, per mine car samples, was \$57.26 per ton. On the 1,750 level the south drift which leads the way for connection with the ore body on this level is in a softer formation, and the face of it is within 32 ft. of the bottom of the incline winze sunk from the 1,700 level. There has been worked in the Morgan mill during the week 230 tons 390 lbs. of ore, closing the run for November, and the average assay value of the ore per battery samples was \$73.97 per ton. Bullion shipped to Carson mint—assay value \$90,120.

Crown Point.—The west crosscut No. 1 on the 800 level is now out a total distance of 53 ft. The face is still in quartz, mixed somewhat with porphyry, giving low assays. On the 500 level we have started west crosscut No. 3 from the end of the south lateral drift, and it is now out 3 1/2 ft. The face is in quartz of low assay value. From the stopes between the 600 and 700 levels and above the 600 level we have extracted during the past week 516 tons, 1,620 lbs. of gold ore, which has been shipped to the Mexican mill for reduction. The average battery sample was \$10.45 per ton, of which \$9.24 was gold.

Hale & Norcross.—On the 975 level advanced and timbered north drift from No. 1 west crosscut 8 ft., total length 48 ft. The streak of ore in the face of this drift is widening and the ore is high grade. During the week we have hoisted from the 975 level 4 cars of ore, assaying per mining car sample \$84.50 per ton.

Gould & Curry.—On the 200 level the joint incline winze started on our north boundary has been sunk 12 ft., passing through hard porphyry; total depth 44 ft. Resumed work in west crosscut No. 5, which was started in northwest drift, 432 ft. from main west drift, and advanced the same 8 ft.; total length, 1,168 ft.; face in hard porphyry.

Mexican.—On the 1,465 level the drift running north from the end of west crosscut started from the top of the upraise which was carried up 45 ft. above the sill floor of this level at a point 40 ft. west from the main north drift and 100 ft. north from the south line of the mine, has been extended during the week 19 ft.; total length, 154 ft. Face in porphyry and quartz carrying some value. As joint work with the Ophir company are making repairs in the Ophir shaft on the 1,100 level and upward,

Occidental.—From the west ledge above the 400 level we extracted about six tons of ore of the average assay value of \$24 per ton, as per car sample.

Ophir.—On the 1,465 level the west crosscut, 62 ft. up, from this upraise carried up 80 ft. above the sill floor of the level, at a point 70 ft. in from the mouth of the crosscut, run east from the main north lateral drift and 124 ft. north from the main east crosscut from the shaft, was extended 6 ft.; total length 140 ft.; continuing in porphyry and quartz. A portion of the week was spent in repairing this crosscut, which is in heavy ground. In the Central tunnel no advance has been made in the face of the drift running southeast from the end of the south drift from the bottom of the winze, on the 250 level of the mine. The upraise from this southeast drift, 112 ft. in from its mouth, has been carried up 7 ft.; total length 21 ft. From the upper part of this upraise on the south side we have worked out a space equal to one square set of timbers which carried ore 3 ft. wide, assaying \$25 per ton. The ore extracted from this point, with some which had been stored, amounting in all to 70 tons, has been raised to the surface, the average assay value of which is \$48.83 per ton.

Potosi.—The southeast drift from the main west crosscut, 550 level, is now out to a point 200 ft. south of the north line. At this point an east crosscut has been started to connect with the bottom of the south winze, 455 level. Various repairs where necessary are under way. The northwest drift from the shaft, on the surface, is now out a total distance of 228 ft.; extended 50 ft. during the week; the face is in porphyry.

Savage.—On the 1,000 level in the north lateral drift from the east drift they continue to extract ore from the sill floor and upward to the eighth floor. During the week they have hoisted 97 cars of ore. Car samples average \$28.50. Shipped to Nevada mill 180 tons and milled 115 tons. Battery samples average \$20.51. Bullion yield for the week, \$1,651.

Segregated Belcher.—On the 200 level the east crosscut from the south lateral drift is out 8 ft., having been commenced during the past week. The face shows a mixture of quartz and porphyry. Have hoisted during the week 10 tons of fair grade ore.

Sierra Nevada.—The northwest drift, at a point 160 ft. west of the mouth of the Layton tunnel, is out 321 ft.; advanced 21 ft. during the week; face in porphyry and clay.

Union Consolidated.—The west crosscut from the Union Consolidated south lateral drift from west drift, 1,520 ft. west of shaft, has been extended 22 ft. during the week; total length, 311 ft.; face in clay with streaks of quartz and a seepage of water.

## NEW JERSEY.

## Morris County.

Wharton.—The new pumping engine at this mine at Hibernia is now running and so far very successfully. The mine is now shipping about 100 tons a day of iron ore, but the shipments are to be increased after Jan. 1.

## NEW HAMPSHIRE.

## Coos County.

Kilkenny Granite Company.—This company has been organized with \$150,000 capital stock for the purpose of developing granite quarries in the Kilkenny mountains. The office is at Lancaster. The quarries are to be opened on an extensive scale. Some stripping and preliminary work have already been done.

## Grafton County.

Enfield Pink Granite Company.—At the recent meeting of the stockholders the following officers were elected: President, B. H. McCormick; vice-president, D. L. Tilton; treasurer, John L. Spring; clerk, R. B. Jacobs; directors, D. L. Tilton, B. H. McCormick, J. L. Spring, D. M. Ladd and R. B. Jacobs. The directors voted to purchase the quarries located four miles from Enfield, formerly worked by Buckley & McCormick, and more recently by B. H. McCormick. The capital stock is fixed at \$10,000. There is one quarry of ordinary granite, another of a like quality, and one of a pink granite, the entire property containing 66 acres, also a large boarding-house, derricks, blacksmith shop and other necessary appurtenances.

## NEW MEXICO.

## Colfax County.

Considerable excitement has been caused by a report of the discovery of gold about 10 miles south of Raton, in the section of country lying between Tenaha and the Black Mesa. Miners are going to the new field from all quarters, and the town of Blossburg is almost depopulated. The first discovery was made by Joseph Lodin, who has a shaft down 22 ft., and claims to have a vein 18 in. wide.

## Grant County.

Azure Mining Company.—Work has been temporarily suspended in this company's turquoise mines in the Burro mountains owing to the severity of the weather. The men, however, are all employed making a new road to the mine, which is very much needed.

## NEW YORK.

## Washington County.

Wing Quarry.—A new red slate quarry has been opened on the Wing property in Truthville in the northern part of the town of Granville. The deposit of slate there is known to be extensive.

## Westchester County.

**Crescent Emery Company.**—This company has been incorporated to mine emery ores and to manufacture and sell emery at Oscawanna, near Sing Sing. The capital is \$30,000. The directors are W. O. Case and James W. Depew, of Brooklyn; H. Gilbert, Georjt Pfaff and W. H. Sheridan, of New York City.

**Tuckahoe Marble Quarries.**—It is stated that some extensive contracts for building-stone have recently been secured by these quarries. Tuckahoe marble formerly had a high reputation and many buildings in New York were constructed of this stone, but of recent years it has been to some extent superseded by the Vermont marble. The operations at the quarries are to be extended.

## PENNSYLVANIA.

## Anthracite Coal.

**Lehigh Coal and Navigation Company.**—The report telegraphed from Philadelphia which appeared in a number of papers, including our own, that Mr. E. W. Clark, of Philadelphia, had been chosen president of this company was not only incorrect, but premature, as the meeting of the directors was not held until the afternoon of that day, when Mr. Calvin Pardee was chosen president. Mr. Pardee, as noted elsewhere, has a high reputation in the anthracite coal trade and will doubtless fill the position acceptably.

**Lehigh Valley Railroad Company.**—The management of this company announces the following ticket to be voted for at the annual meeting in Chicago and recommends it to the stockholders: President, E. P. Wilbur; directors, Charles Hartshorne, William L. Conyngham, William A. Ingham, Robert H. Sayre, James L. Blakslee, John R. Fell, John B. Garrett, Charles O. Skeer, Beauveau Borie, Joseph Wharton, Thomas McKean and George H. Myers. Mr. W. A. Dick, secretary of the Stockholders' Committee, reports that a number of proxies have been received. The committee has declined to show how many. Probably its ticket will be made public in a short time. At a special meeting of the board held December 17th the resignations of Directors William H. Sayre, Henry S. Drinker and Rollin H. Wilbur were presented and accepted. The board immediately elected Joseph Wharton and Thomas McKean, of Philadelphia, and George H. Myers, of Bethlehem, to fill the vacancies.

## Bituminous Coal.

**Cleveland Colliery.**—Some extensive improvements are being made at this colliery, at Bellevue, in the Monongahela district, and a new haulage system is being put in and an electric light plant. A Jeffrey electric coal cutter has also been ordered.

**Hamilton Coal and Coke Company.**—This company has leased the coal rights over a tract of about 2,000 acres in Somerset County, and has several parties now at work drilling test holes. If the result is favorable as expected, the work will be begun in the spring.

**Havela Coke Company.**—This company, in the Connelville region, has in course of construction a new storage reservoir, which when completed will hold enough water to supply the works through the dry weather. Nearly all the coke plants in this district had a great deal of trouble with their water supply last summer.

**Somerset Coal and Coke Company.**—This company, in the Somerset County district, struck a vein of gas coal last week at a depth of about 145 ft. The company intends to develop this coal and put it on the market next spring, if possible. Work has already been begun on a slope to reach the vein.

## Armstrong County.

**Equitable Gas Company.**—This company, which some time ago leased 3,000 acres near Apollo, and commenced to sink several wells, last week made an important strike, reaching gas at a depth of 1,300 ft. The pressure is very high, and the find has created some excitement in the neighborhood. The well is 10 miles from the nearest previously known gas district, and is three miles from Apollo, on Roaring Run, a small tributary of the Kiskiminetas. The company had previously sunk several holes on this tract without obtaining anything.

## Clearfield County.

**Clearfield Quarry Company.**—This company is opening up a large quarry in the northern part of the county, near the line of the Buffalo, Rochester & Pittsburg road. It is understood that the company has several large contracts for stone, including one for cut stone for a bridge over the Delaware River.

## Northampton County.

**Anglo-American Slate Company.**—The real estate, consisting of about 125 acres of land in Upper Mount Bethel township, was sold recently to G. W. Mackey, Esq., attorney for the execution creditors, for \$500.

**Franklin Quarry.**—E. D. Peters & Co. have just completed the equipment of their new quarry, which will be known as Franklin Quarry No. 2, with new and powerful hoists, engines, etc., and will commence making slate at once.

**Slatington Slate Company.**—This company has made application for a charter of incorporation. Henry Kuntz, W. W. Bowman, F. O. Ritter, George W. Sandt and S. B. Costenbader are the incorporators.

## RHODE ISLAND.

The granite manufacturers, at a meeting held recently in Westerly, organized a State association, with headquarters in Providence. The new association at once voted to become a member of the New England Granite Manufacturers' Association.

## Washington County.

The granite quarrymen in and about Westerly are trying to make arrangements to establish works for cutting the granite quarried in the neighborhood, most of which is at present shipped in the rough. The quarry owners and the Stone Cutters' Union are working together for this purpose.

## UTAH.

The total transactions in ore and bullion in Salt Lake City for the week ending December 15th amounted to \$117,093; a decrease of \$51,929 from the preceding week, chiefly owing to the falling off from the smelters. The Ontario company shipped 27,173 fine ounces of silver.

Ore and bullion shipments from the Territory for the week were: 21 cars ore, 888,430 lbs.; 18 cars bullion, 662,425 lbs.; 4 cars copper matte, 180,392 lbs.; making a total of 43 cars and 1,731,247 lbs.

## Juab County.

**Centennial-Eureka Mining Company.**—The new air compressor at this mine is now ready for operation, and the connections are being made in the mine. As soon as they are finished the working force underground can be increased. The company declared its fourth double dividend on December 15th, and hopes to be able to continue payments at this rate for some time.

## Salt Lake County.

**Hanauer Smelting Company.**—This company is making arrangements to put up two new Brown horseshoe roasting furnaces and to make other additions to the plant.

**Salt Lake Copper Manufacturing Company.**—Current reports in Salt Lake are to the effect that notes of this company to a large amount due December 24th will not be paid, and that a foreclosure of the trust deed given to secure the notes will speedily follow. The further report is that the plant will be bought in by the creditors and changed from a copper to a general smelting plant.

## Sevier County.

**Sevier Gold Mining Company.**—This company's 10-stamp mill is running steadily, and the shipments of bullion have averaged about \$5,000 monthly. A couple of strikes in the mine are reported. At the bottom of the 180 ft. shaft workings a 5-ft. vein of ore, running \$18 per ton in gold, has been opened up, while in the tunnel workings, 200 ft. away and farther down the hill, a parallel vein has been encountered. The width of this latter vein is 7 ft. between walls, and the entire vein carries ore averaging \$17.50 in gold.

## VERMONT.

## Rutland County.

**Vermont Marble Company.**—A bill is before the Legislature to incorporate this company, which is substantially a rechartering in Vermont of the old company of the same name, which was organized under New York law. The headquarters of the company will be at Proctor, where the extensive quarries are, and the capital stock will be \$3,000,000. The incorporators are: F. D. Procter, F. C. Partridge, E. R. Morse, S. A. Howard, Fisher A. Baker, F. B. Riggs, A. Smedburg, J. R. Meyers, T. S. Williams, B. F. Taylor and W. E. Higbee.

## Washington County.

A charter has been granted by the Legislature to the Woodbury & Hardwick railroad. This line will be a branch of the St. Johnsbury & Lake Champlain railroad, and will open up the granite quarries at Woodbury, which can furnish a very fine quality of stone, but have hitherto been prevented from doing so by the difficulties of transportation.

## WASHINGTON.

## King County.

**Oregon Improvement Company.**—Fire broke out in this company's New Castle coal mine, at Coal Creek, 10 miles from Seattle, on the afternoon of December 18th. About 125 men were working in the mine at the time, but they all succeeded in getting out safely. Prompt measures were taken to stop the fire. Coal Creek, which runs near, was stopped by a temporary dam, and a flow of the stream turned into the mine. The damage, including the cost of unwatering the mine, will be over \$50,000.

## Stevens County.

**Cleveland Mine.**—This company now has its original shaft down 54 ft., and the ledge still continues clear and well defined, proving, so the owners claim, that the ore body discovered is a vein and not a surface deposit. The ore runs about 60% in lead and also shows well in silver. A tunnel was recently started to tap the ledge at another point and is now in 125 ft.

## WYOMING.

## Fremont County.

**Gold Reef Mining and Milling Company.**—This company has been organized to operate mines in the Gold Reef district. The capital stock is to be \$2,500,000. The trustees for the first year are Charles E. Wright, Henry J. Powers, Albert D. White, Herman L. Wolf, George Sugg, William L. Wright, Henry Knight, Edwin White and John Hollowed.

## FOREIGN MINING NEWS.

## BRITISH COLUMBIA.

**Cariboo Gold Fields, Limited.**—This is the name of a company which is now being floated in London, with a capital of £100,000, to work the gold properties belonging to Mr. A. D. Whittier, of Barkerville, British Columbia. The chief men of money enlisted so far are Mr. Meyer, a barrister, and Mr. Cundall, both of London.

(From an Occasional Correspondent.)

**Minerva Mining and Milling Company.**—This company has been doing considerable prospecting work during the last three months. The company opened up a vein of free milling ore in a shaft 12 ft. deep, and considerable free gold has been taken out of this vein. Work has been stopped for the present while they are putting up an overshot waterwheel 15 ft. in diameter, and digging a ditch to carry water to the mill. It is expected that work will be resumed in the mine early in February. The vein is in slate porphyry and schistose rock. It was found while crosscutting through a dark blue porphyry with small stringers of quartz carrying gold. The outcrop was porphyry about 2 ft. thick which the crosscut penetrated, exposing the lode. This is about 3½ ft. wide, with quartz running from 8 to 12 in. in thickness. The rock is from 12 to 14 in. on the east and 16 to 20 in. on the west side of the quartz. The exact extension of the vein will not be known until later, but the distance which the outcrop has been traced along the surface is considered as justifying the company in erecting a plant. The Provincial Government, it is expected, will open a road into the district in the spring, as a vote on the appropriation will be taken during the present session. When this is done other mills will probably be erected in the neighborhood, as quartz bearing free gold has been found in a number of places.

## BRITISH INDIA.

The reports from the Colar goldfield, in Mysore, show productions for the eleven months ending November 30th, by the five leading companies, as follows: Balaghat-Mysore, 5,207 oz.; Champion Reef, 47,899 oz.; Mysore, 47,226 oz.; Nundydroog, 26,549 oz.; Ooregum, 62,899 oz.; total, 189,780 oz. gold, showing an increase of 855 oz., or 0.5%, over the corresponding period last year. The comparison varies widely for the different companies. Decreases are shown by the Balaghat-Mysore of 1,535 oz., or 22.9%; the Mysore of 13,194 oz., or 21.9%; and the Ooregum of 5,547 oz., or 8.1%; while the Champion Reef shows an increase of 19,390 oz., or 6.7%; and Nundydroog of 1,741 oz., or 7.0%, in output.

## GERMANY.

The production of pig iron by the German blast furnaces in October was 490,934 metric tons, which compares with 473,070 tons in September and with 537,183 tons in October, 1893. Of the output this year, 133,035 tons are classed as forge iron including spiegel, 84,210 tons as foundry iron, 32,508 tons as Bessemer pig, and 241,181 tons as Thomas pig. The iron adapted for conversion into steel by the Thomas-Gilchrist process continues to run very nearly half of the output of the German furnaces, while Bessemer pig is a gradually decreasing quantity. This shows not only the hold which the Thomas process has taken upon upon the German steelmakers, but also the extent to which steel has replaced and is replacing both cast and wrought iron. The Bessemer and Thomas pig together made up about 57% of the output, while the forge iron is about 26% and the foundry iron about 17%. The number of furnaces in blast was 36, against 131 a year ago. The total output for the ten months ending October 31st, was 4,579,189 tons, showing an increase of 495,124 tons, or about 11%, over the corresponding period last year.

## GREAT BRITAIN.

**Cassel Gold Extracting Company.**—This company's report, which has just been published in London, says that the year lately closed shows a net profit of £654, after charging off £5,000 for depreciation of plant, etc., and £14,550 for the usual writing down of the patents. The balance at the close of the year was £7,840, against £7,186 carried over from the previous year. Concerning the MacArthur-Forrest cyanide patents, which the company owns, the report says: The patent affairs of the company have required and received much care and attention. The action for infringement against the Cyanide Gold Recovery Syndicate, Limited, Pielsticker, and others, in respect of the patent No. 14,174 of 1887, for the MacArthur-Forrest process of obtaining gold, etc., from ore by treatment with cyanide, as described therein, was heard in July, in London, before Mr. Justice Romer, and his decision was given against the company on November 8th. The company at once appealed, and are informed that the appeal will be heard in December or January by the Court of Appeal. In Germany an action to set aside the similar patent there was raised against the company, which was heard in April. Prior knowledge (including the United States patents of Simpson and Rae) was strongly founded on, and the whole case thoroughly gone into. Judgment was given entirely in the company's favor, and the opposition have appealed. The appeal is expected to come on for hearing in Leipzig before long. Recently, two other actions have been raised against the same patent in Germany by different parties. They are on practically the same grounds as the first action, and quote the same documents.

### MEXICO. Chihuahua.

**Palmarejo Mining Company.**—The wrangle between this company and the Mexican Mineral Railway Company still continues. The opposition to the scheme of amalgamation seems to be assuming important proportions. A meeting of the shareholders of the Mexican Mineral Railway Company was held in London on November 30th, and considerable opposition was given to the proposed scheme. It appears that the directors and others who favor the scheme are largely interested in the Palmarejo, while the opponents own shares in the railway company only. The facts of the case have been recited in these columns more than once, so it is needless to go over them again. A vote of the shareholders in the railway company on the question is to be taken on December 10th.

### NEWFOUNDLAND.

**Belle Isle Iron Mines.**—These iron ore beds are now leased by Graham Fraser. Plans are being prepared for a wire tramway about 1½ miles long, to carry ore to the shore, where a wharf is to be built. The ore is said to have about 60% iron.

**Little Bay Copper Mine.**—This mine at Notre Dame Bay is now employing about 25 men. The shaft is down 1,300 ft.

**Tilt Cove Copper Mine.**—Work is going on steadily, with an output of 6,000 tons of ore a month. Three new matting furnaces have just been completed.

### NOVA SCOTIA.

**Broad Cove Coal Company, Limited.**—The officers of this company, incorporated at the last session of the Legislature of Nova Scotia, are: John M. Raymond, president; Alpheus P. Alger, vice president; William Penn Hussey, treasurer and general manager; Edgar S. Buffum, secretary; Warren D. King, electrical engineer; directors, Wm. H. Munroe, Martha's Vineyard, Mass.; George W. Gale, Boston; John Y. Pazant, Halifax, N. S.; John M. Raymond, Salem, Mass.; Warren D. King, Peabody, Mass.; Alpheus P. Alger, Cambridge, Mass.; Edgar S. Buffum, Salem, Mass.; J. R. Naegeli, Zurich, Switzerland; William Penn Hussey, Danversport, Mass. The American Loan and Trust Company, of Boston, is trustee of the company, holding a deed of trust for \$1,000,000 as a guarantee of payment of principal and interest of bonds. The areas controlled by the company cover two square miles, and are located in Inverness county, Cape Breton. The company is preparing to build a shipping pier off McIsaac's Lake, tenders for the dredging of which have been given out.

**Caribou Mine.**—Messrs. Dixon & Company have completed the transfer of this property to the Caribou Gold Mining Company, Limited.

**Golden Lode Company.**—The new mill of this company in South Uniacke is reported ready for running. The quartz taken out of the lead cut by the shaft has been milled at the Thompson-Quirk mill, and yielded an average of over 7 oz. to the ton.

**Moose River.**—Mr. Damas Tonquay continues to work steadily the surface gravel on this property. Last year he crushed 4,131 tons, which gave an average of 1.6 dwts., making this the lowest grade ore worked in Nova Scotia.

**Richardson.**—The October return of this mine in Stormont was 300 oz. from about 900 tons. The new plant is now running smoothly, and the faces in the mine workings are showing a higher grade of ore. The McMillan lode has been cut on the western end of the property and is about 18 in. wide, showing gold freely.

### ONTARIO.

#### Natural Gas.

(From our Special Correspondent.)

The intimation is made that natural gas from the county of Essex in the Province of Ontario will soon be used in Detroit for illuminating and heating. Contracts are under way for the laying of submarine pipe in the bed of the Detroit River. It is to reach from Orleans street, Detroit, to Gladstone avenue, Windsor, Ont., and from the latter place a main will be laid to the Ontario Basket factory to connect with the main at that point. The present line to the field is only 8 in. in diameter, but the company is prepared to lay a 12 in. line alongside of it. The supply of gas is obtained from a small area along the northern shore of Lake Erie, in the township of Garfield South, Essex County, a distance of about 35 miles. The gas-bearing formation is supposed to be either a Clinton or a Niagara limestone, and is reached at a depth of 1,050 ft. There are at present eight producing wells in this field whose aggregate capacity is estimated at 40,000,000 to 42,500,000 cu. ft. per day. The remarkable feature of the Essex field is the persistence with which the rock pressure on the wells situated within it has been maintained, notwithstanding the smallness of the gas area, which is only about two miles square; the natural pressure when the first well was opened in January, 1889, was about 420 lbs., and in spite of the usual amount of wastefulness and the constant demand for supply of the neighboring towns and villages, the pressure remains at the same figure. The local theory is to the effect that most of the field is under the bed of Lake Erie, the Kingsville wells being situated upon the very edge of the gas-bearing strata, and that in consequence there is a large reserve of gas tributary to the place of actual production. The correctness of this view

will be tested when the pipes to Detroit are completed, and when the full force of the city demand makes itself felt upon the tiny field. The gasfield in Welland and Haldimand counties is of much larger area, being about 35 miles long and from 2 to 7½ miles wide. By far the greater part of the production of this field is piped across the Niagara River to Buffalo, about 14 miles away, the daily delivery being about 4,600,000 cu. ft. The effect of the constant drain upon the wells has been very marked. When first opened in 1849 the rock-pressure stood at about 570 lbs., since which time it has steadily decreased until now it ranges from 80 to 200 lbs., and even lower. It has ceased to be possible to send the gas to Buffalo by the natural pressure, and compressors have been in use for about a year in order to force the gas to the place of delivery. The Welland field will in all probability soon be exhausted, perhaps in two or three years, and the chances are that with the Detroit demand the Essex field will be depleted in a longer or shorter time. It is a reflection upon the enterprise of the people of Ontario that they allow this most valuable natural asset to be exported to furnish cheap light and fuel to the citizens of Buffalo and Detroit. They will probably awaken to a sense of its value when it is all gone. The officers of the Kingsville Natural Gas Company, which is exporting the gas to Detroit, denied before a committee of the legislative assembly last April that they had any intention of piping the gas across the river, and expressed themselves as opposed to such a policy.

### Rainy River District.

(From our Special Correspondent.)

The Sultana excepted, very little active mining, and positively no milling, operations worth recording have been carried on during the current year, in this rather interesting mineral section of the Province. At the mine named a limited force of hand and power drillers have been engaged continuously in sinking the main or No. 1 shaft to a depth of 154 ft., and two other pits to a depth ranging from 40 to 55 ft. each, with adit levels in the main shafts, as well as a very appreciable quantity of stoping throughout, so that the 10-stamp mill was frequently kept running to its nominal capacity. As much of the output consisted of quartz of fairly high grade, and all of a decidedly free-milling character, the shipments of bullion should be good. Your correspondent is informed on authority that \$20,880 is the amount obtained.

A considerable impetus, apparently, has lately been given to mining auriferous quartz lodes in this immediate section, and along the line of the Canadian Pacific Railway from Wabigoon to Rossland, and southward by the Manitowish and La Seine water stretches, where several new finds are now under more or less active and intelligent development. These latter are at or near the international boundary line, and include the Little Canadian (opposite the Little American in Minnesota). The Madeline and the Ray-Weigand on La Seine River, where the same geological conditions prevail as upon the Lake of the Woods.

**King Mine.**—This mine, adjacent to the Pine Portage, is also under active development. Several parcels of the ores of the foregoing new claims have been subjected to mill tests with good results, and from all appearance the advent of better times in our comparatively new mineral region is by no means distant.

**Regira.**—This mineral claim, some 50 miles southwest of Rat Portage, and lately acquired by an English company, the Rajah Mining Company, Limited, is also placed under development with excellent prospects of success.

**Rossland.**—This group is situated almost immediately west of Pine Portage, and the Sultana mines. Of these the following claims are being developed by contract and otherwise: The C. S. Morris Estate 247 P; 1<sup>st</sup> and 1<sup>st</sup> by Mr. Torrence of Montreal with good results in free gold; the Breakneck Lake claims owned by S. V. Huestead, of Detroit; and the Grey Eagle of The International Mining Company, of Chicago and Cleveland.

### SOUTH AFRICA.

#### Transvaal.

**Witwatersrand Gold Production.**—The monthly analysis of production issued by the Johannesburg Chamber of Mines shows that during October the total tonnage of ore treated in the mill was 243,165 tons. The number of stamps at work in the district was 2,265. The tailings treated amounted to 256,844 tons, all by the cyanide process with the exception of 3,100 tons treated by the Siemens-Halske electric method. The total tonnage of concentrates is not given, but most of this class of work was done by the chlorination process. The yield of gold for the month was: from millwork, 108,810 oz.; concentrates, 8,106 oz.; tailings, 53,630 oz.; other sources, 2,832 oz.; making a total of 173,379 oz. As the usual average of Witwatersrand gold is 800 fine, this gives a total of about 138,700 fine ounces. The average yield from millwork was 0.4175 oz. per ton. The average yield from tailings was 0.2075 oz. per ton. The largest producer for the month was the Langlaagte Estate, 13,103 oz., of which 8,440 oz. were from millwork, 871 oz. from concentrates, and 3,792 oz. from tailings. The Robinson Company came second with 11,846 oz., and the Crown Reef third with 11,048 oz. Other large producers were the City & Suburban, 8,399 oz.; the New Primrose, 7,556 oz.; the Goldenhuis Estate, 6,301 oz.; and the Ferreira, 5,478 oz.

### LATE NEWS.

**Mr. L. D. Godshall,** recently superintendent of the Rico Smelter at Rico, Colo., has accepted the position of superintendent and metallurgist of the Everett Smelter at Everett, Wash.

The Tennessee Coal, Iron and Railroad Company estimates its net earnings for the month of November at \$90,800. The fixed charges amounted to \$59,700, leaving a surplus of \$31,100 for the month.

The Osceola Mining Company, of Michigan, has declared a dividend of \$1 per share; the first for the present year. In 1893 the company paid \$2. The present dividend makes the total amount to date \$1,897,500.

**Mr. Olin H. Landreth,** who recently resigned the professorship of engineering in Vanderbilt University, Nashville, Tenn., is now professor of civil engineering in Union College, Schenectady, N. Y., to which place he has removed his residence.

The Bulwer Consolidated Mining Company, of Bodie, Cal., has levied assessment No. 10 of 5c. per share. This assessment will be delinquent in the office on January 16th, and stock on which it has not been paid will be subject to sale on February 15th.

A Hazleton dispatch reports that at the Philadelphia & Reading Coal and Iron Company's Bast colliery, near Big Mine Run, the Mammoth vein has been found. This vein is famous in the anthracite region, and its rediscovery will make the Bast a valuable property.

It is stated that **Mr. John Wanamaker** has consented to head the opposition ticket of the Lehigh Valley stockholders, and to appear as their candidate for president. Under the Lehigh Valley charter, that officer is elected directly by the stockholders.

The Board of Arbitration appointed to settle the controversy in the Massillon coal mining district in Ohio has unanimously reported abolishing the existing differential of 15c., and placing this district on the same basis as the Hocking Valley and Sunday Creek districts. The report is a great disappointment to the miners.

A Columbus, O., dispatch gives a rumor that negotiations are now in progress for the formation of new combination to include the bituminous coal operators of Ohio, West Virginia and Pennsylvania, the object being to control the bituminous coal trade of the East and South. The report gives no particulars, and certainly requires further confirmation.

The San Carlos Coal Company, in Presidio County, Tex., expects to build a road to connect with the Southern Pacific and the Texas & Pacific railroads. The mine contains two veins separated by a stratum of soft shale from 12 to 15 in. thick. The greatest thickness of the upper vein is 2 ft. 8 in., and of the lower 3 ft. 8 in., making a total of 6 ft. 4 in. At some places the veins show a less width or thickness, but at all places where openings have yet been made the two veins show a thickness of about 4 ft. in all.

### BY TELEGRAPH.

(From our Special Correspondent.)

**LEADVILLE, Colo., December 21.**—The gold strike last night in the Triumph, following immediately upon strike in the Rex property, reported by mail, caused the greatest enthusiasm here. The Triumph shaft adjoins the Little Johnny on the south. At a depth of 242 ft. the shaft entered the ore body; it has been sunk through ore 10 ft., and the bottom is not yet in sight. The stuff assays 2½ oz. to 3 oz. gold and 17 oz. silver. It is believed to be the southern continuation of the Little Johnny ore chute; if not that, it is an entirely separate gold ore chute, which is a very valuable discovery. All the ore taken out today is similar to that in the Little Johnny. Mr. I. I. Weed, of Denver, is president of the Triumph company; F. C. Kaye is secretary and treasurer. C. B. Nicholson and other New York people are heavy stockholders. John Livesey, general manager, is also interested in property. There is great excitement here over the discovery, and many new deals are the order of the day. New companies are being incorporated, and many claims will be taken up.

### Cripple Creek, Colorado.

(From our Special Correspondent.)

**Anchoria Leland.**—This mine, also on Gold Hill, has made a rather important strike in its 16 ft. shaft. The course of the vein is a little east of north and is 2½ ft. wide, all pay ore. The lessees are feeling very happy.

**Gillette Mill.**—This mill is nearing completion; the delays caused have been on account of machinery not on hand. Now that most of the castings are on the ground, the early part of January will see this mill in operation. Everything about the work is of the most substantial character.

**Lawrence Mill Gold Extraction Company.**—This



company's chlorination plant commenced to work on an enlarged scale December 15th. The Pearce furnace of 50 tons capacity is doing all that was expected. There are several hundred tons in the bins awaiting treatment, and there will be no shutdown on account of no custom ore to treat.

Lone Star No. 1.—This mine, also on Gold Hill, is worked under lease from the Anaconda Company, has a 14 ft. shaft, the vein being 3 ft. wide, assaying \$18 in gold and 7 oz. in silver.

Mattie L.—This mine, on Gold Hill, owned by the Jefferson Company, shipped its first car of 11 tons to-day, all taken from its 25 ft. shaft. Five men are employed.

Summit.—This mine on Globe Hill made a phenomenal record last month on 20 stamps. The ore in depth is of a far better grade. A vein of high-grade ore was recently discovered, averaging from \$200 to \$500.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 21.

Statement of shipments of anthracite coal (approximated) for week ending December 15th 1894, compared with the corresponding period last year:

Regions:	Tons.	Tons.	Difference.
	Dec. 15, 1894.	Dec. 16, 1893.	
Wyoming region.....	487,302	475,711	Inc. 12,091
Lehigh region.....	127,905	124,753	Inc. 3,152
Schuylkill region.....	262,655	288,043	Dec. 25,388
Total.....	878,362	888,507	Dec. 10,145

Totals for year to date. 39,942,918 41,470,524 Dec. 1,527,576

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending December 15th and year from January 1st:

Shipped East and North:	1894.		1893.	
	Week.	Year.	Week.	Year.
Phila. & Erie R. R.....	1,819	73,972	1,819	74,576
Cumberland, Md.....	67,355	2,966,742	3,938	91
Barclay, Pa.....	1	16,841	1	42,790
Broad Top, Pa.....	9,937	338,542	1	541,016
Clearfield, Pa.....	88,553	2,617,035	3,614	784
Allegheny, Pa.....	36,500	1,219,715	1,188	751
Beech Creek, Pa.....	89,775	2,240,711	2,578	214
Pocahontas Flat Top.....	74,209	3,338,047	2,716	925
Kanawha, W. Va.....	75,295	2,632,417	3,075	141
Totals.....	443,413	15,484,612	17,770,594	

† Returns not received.

Shipped West:	1894.		1893.	
	Week.	Year.	Week.	Year.
Pittsburg, Pa.....	32,972	1,424,174	1,154	101
Westmoreland, Pa.....	38,736	1,584,055	1,721	540
Monongahela, Pa.....	11,158	635,932	661	589
Totals.....	82,866	3,644,161	3,547,230	

Grand totals..... 526,309 19,128,773 21,317,824  
Production of coke on line of Pennsylvania Railroad for the week ending December 8th, 1894, and year from January 1st, in tons of 2,000 lbs.: Week, 114,949 tons; year, 3,473,672; to corresponding date in 1893, 3,764,008 tons.

Anthracite.

In almost every particular the review of the anthracite coal trade which we published last week might stand for this week. The same conditions prevail—and will continue to prevail until the advent of cold weather.

The market to-day is in a healthier condition than it has been at any time during the past six months. Not that there is a good business doing or that anybody connected with the coal trade is rapidly growing rich, but that there is no longer the stupid disregard for the fundamental principles of political economy and the safe conduct of business which characterized the actions of sellers during the last few months.

Not since the collapse of Mr. McLeod's short-lived dream—the "Reading combine"—has there been such harmony between the various anthracite interests as there is to-day. It has even been suggested that some new form of agreement has been reached by the various companies, some new rules to govern the "pool," by means of which the various companies have been enabled to carry out the pledges entered into at the last meeting of the sales agents. We are assured by the officials of several of the more prominent companies that such is not the case. There has been no change, and that only a "gentleman's understanding" exists. Be it as it may, there is evidence that the sales agents have received explicit instructions to live up to their own recommendations. And it now looks very much as if this month we shall witness the rather novel spectacle of the various anthracite interests actually keeping their word. Very little business is doing; trade everywhere is exceedingly dull. The West has about all the supplies it needs, and the East is in pretty much the same condition.

Dealers are buying practically nothing. As an instance: At an auction sale which took place on Thursday in a bankrupt dealer's yard in this city a small lot of coal was bought by other dealers in the neighborhood at ridiculously low prices. Thus 70 tons of red ash stove sold for \$2, an equal quantity of red ash chestnut brought \$2.25, and an odd lot of about 100 tons of white ash grate stove and nut, strangely enough, brought the higher price of \$2.50 per ton. The red ash stove retails freely for \$5.25 a ton, yet it brought less than half that price. This will show how little disposition to increase their stocks is manifested by dealers here. There is a lot of stove coal which has been offered at \$2.90 on board, but the quantity is not specified, although it is certain that it is not a first class coal. Buyers are not in the market for any coal at this moment, and this fact is realized by the large producers.

The sales agent of one of the largest of the companies said to a representative of the "Engineering and Mining Journal" to-day: "A few days before the last meeting a customer asked for prices on 450 tons of free-burning stove coal, and I quoted him \$3.25 on board. He did not reply to my letter until this week, when probably the news reached him that prices had been advanced and were really being maintained. He wrote accepting my offer. I would have sold him the coal at the price I named him, and, between us, I would have been glad to do so, had it not been that I had strict orders from the president not to sell below the circular under any circumstances. So I wrote to my customer telling him that the price was now \$3.60. To my surprise he accepted it yesterday, and I shipped the coal at once." That lot of 450 tons of stove is about the only sale made by that company this week. There are not many who have sold more. One agent tells of a sale of three cargoes, one of them of 125 tons, the other of 40 tons, and he stammers when he speaks of "the other." But the encouraging fact remains that the sales have all been at the circular, which is \$3.60 for stove, \$3.45 for egg and chestnut and \$3.35 for broken, all net on board.

All the companies declare their intention to curtail their outputs during the remainder of the month. The Lehigh Valley Coal Company will shut down its collieries on Saturday, December 22d, and remain closed for a week, and perhaps until after New Year's day. The other companies, all newspaper reports to the contrary notwithstanding, will not resort to such radical measures, but they assert that they will all take steps to restrict their output within the limits agreed upon. For the week ending December 15th the output was 878,362 tons. Added to the output of the preceding week it makes 1,674,277 tons for the first half of the month. And this means that during the second half of the month there must not be mined more than 881,902 tons, if the output for this month is to be one-half of that of last June, which reached 5,112,309 tons.

NOTES OF THE WEEK.

The Bureau of Anthracite Coal Statistics makes the following statement of anthracite coal shipments for November and the eleven months to November 30th, compiled from the returns furnished by the mine operators:

	November.		Eleven months.	
	1893.	1894.	1893.	1894.
Wyoming region.....	2,122,517	2,339,567	21,970,238	20,869,446
Lehigh region.....	594,781	673,157	6,370,593	6,193,680
Schuylkill region.....	1,188,189	1,489,557	11,312,300	11,206,707
Total.....	3,905,487	4,499,281	39,653,131	38,269,833

The increase for the month was 587,794 tons, or 15.1%; the decrease for the 11 months was 1,386,298 tons, or 3.5%. The unrestricted output in November, it will be seen, reached the large total of very nearly 4,500,000 tons.

The stock of coal on hand at tidewater points November 30th was 874,906 tons, against 732,265 tons on October 31st, showing an increase of 142,641 tons during the month.

Bituminous.

We find absolutely no change to report of the bituminous coal market. Great dullness prevails and very little business is doing in any branch of the trade. Most of the producers are endeavoring to secure what few spot orders there are on the market, and such is the condition of the trade that certain sellers are seeking orders of much smaller size than they would ordinarily care to get. The great bulk of the business doing consists of shipments on old contracts.

Producers are curtailing operations. It is generally admitted that stocks on hand in consumers' yards are not as heavy as usual at this time of the year.

With the conditions at present prevailing in the trade, there is but a small margin of profit, so that it precludes the probability of new competitors. We have heard of several coal properties which have been examined with a view to the formation of companies to exploit them, and these enterprises, owing to the condition of the trade, have been abandoned temporarily.

The local trade along the lines of the railroads from the mines to shipping ports is exceedingly dull.

The Chesapeake & Ohio Canal stopped shipments on December 18th, and the water will be withdrawn from the levels on Saturday, December 22d. It is claimed by the management that the canal has had a successful year. There were but few shipments made from Georgetown and Alexandria, the tide-water termini of the canal but a great quantity of coal has been taken by consumers at points along its line.

The transportation of coal from the mines to tide-water is once more unsatisfactory, and coal does not reach the shipping ports as promptly as it should. We have been informed by several authorities that this is due to the fact that the main line roads are endeavoring to curtail expenses, in consequence of which they do not use sufficient motive power or labor. The captains of vessels which have been chartered to take on the coal as it arrives are complaining of the long delays in loading, and shippers expostulate with the roads in vain.

The car supply is fairly good, particularly to those shippers who have been holding vessels to receive the coal as soon it reaches tide. For local points on "foreign" roads especial requisitions for cars have to be made.

The supply of vessels, although not large, is

slightly in excess of the demand. Rates are weak. The open season has kept in commission vessels which otherwise would have sought winter quarters.

We quote ocean freight rates as follows from Philadelphia: To Boston, Salem and Portland, 95c. @ \$1 alongside; Providence, New Bedford, New Haven, Allyn's Point, Bridgeport and other Sound ports, 75c. @ 80c.; Wareham, \$1; Lynn, \$1.05 @ \$1.25; Newburyport, \$1.05 @ \$1.15; Portsmouth, \$1. From Norfolk, Newport News and Baltimore the rates are 10c. higher than from Philadelphia.

Prices are unchanged, and we quote as follows: F. o. b. Norfolk and Newport News, \$1.80 @ \$2.20; f. o. b. Baltimore, \$1.90 @ \$2.25; f. o. b. Philadelphia, \$1.80 @ 2.25; f. o. b. New York harbor shipping ports, \$2.40 @ \$2.75; alongside New York, \$2.75 @ \$3.

Buffalo.

Dec. 20.

(From our Special Correspondent)

The anthracite coal trade continues dull with quotations nominally unchanged. Buyers expect and doubtless obtain concessions from the published schedule prices. Near-by towns seem to have stocks enough on hand to last them for some time and the weather being mild precludes any great movement at present.

Bituminous coal is quiet at nominally unchanged quotations. Manufacturers busy—coal for the supply of tugs and vessels nearly closed for the year; the former are placing the latter into winter quarters. A few more arrivals and departures of vessels are expected this week.

The Buffalo and other coal men who visited the mines of the Pittsburg and Connellsville regions last week had a good time generally and were much delighted with their trip both in a business and a social point of view. They expressed themselves well pleased with their trip and of the knowledge they obtained of the localities visited.

The commission of government engineers estimate that \$3,150,000 would be expended in dredging a 20-ft. channel in the harbor of Duluth and Superior. A reduction of 25% might be allowed if the contracts were given out at one time instead of continuously. There passed through the Sault Ste. Marie canal during the season of navigation of 1894 532,870 net tons of hard coal, valued at \$2,531,132, and 2,264,314 net tons of soft coal, valued at \$5,660,785.

The Niagara Falls Electric Power Company is making rapid progress toward completing its works, so as to supply Buffalo and other places with power, light, etc.

Efforts are being made in all directions to do away with the "smoke nuisance." The Baltimore & Ohio Railroad Company has been experimenting, and with success, in using crushed coke on its locomotives as a steam maker.

The Standard Oil Company intends trying the experiment next year of transporting its oil from Cleveland to Lake Superior ports in tank vessels, to be towed by steamers.

At a meeting held in Pittsburg, on the 15th ultimo, of railroad representatives to consider what the rate should be from the Pittsburg, Connellsville and Reynoldsville regions to Buffalo, no agreement was reached, and a fortnight's adjournment was agreed to.

Chicago.

Dec. 19.

(From our Special Correspondent.)

The conditions reported week in and week out for a long time of the Chicago coal market yet prevail, and there appears nothing of a favorable nature in sight that would alter such a state of affairs. To say that the anthracite coal trade of Chicago for the past week has been flat expresses the condition exactly, and there has hardly any more coal been sold than during one of the summer months of a good year. The trade from out of town is now depended on, and a fair volume of coal is moving through such business. The retailers in the city are doing little, and it has with them come down to a matter of waiting for cold weather. Shipments from the East by rail continue large, and a great part of the arrivals are on the tracks, costing shippers a considerable sum for demurrage charges. There is also a large amount of coal on the docks, the accumulation there being fully 50,000 tons more than last year at this time.

Bituminous coal has been in but little demand the past week, considering the time of the year. The mild weather which has continued another week has been largely the cause for this condition, although in good years the manufacturing concerns are counted on much toward increasing the tonnage of coal consumed. Many of the near-by mines have reduced production, and consequently there is not a very large volume of soft coal coming into this market, but despite this there is more coal coming here than is actually necessary, and the rails are gradually accumulating quantities that cannot be moved.

Prices in both hard and soft coal continue on the go-as-you-please plan.

Circular rates on anthracite coal are: Grate, \$5.00; egg, stove and chestnut \$5.25. For bituminous prices are: f. o. b. Chicago: Youghiogheny, \$3.15; Raymond, \$3.50; Shawnee, \$2.50; Blossburg, \$3.90; New Kentucky, \$2.75; Hocking, \$2.90; Brazil Block, \$2.15; Birdseye Cannel, \$5.25; Green Ridge, \$1.75; Wilmington, at mine, \$1.50; Streator, at mine, \$1.40; Du Quoin, at mine, \$1.05.

Coke remains in good demand, though shipments are larger than call for. Connellsville foundry coke is selling for \$3.90; Connellsville coke crushed, \$4.15; Pocahontas, \$3.85; New River, \$3.85 @ \$4.

**Pittsburg.**

Dec. 20.

(From our Special Correspondent.)

**Coal.**—The character and extent of this mining industry are not generally known and appreciated. Even in Western Pennsylvania, the heart of the bituminous coal region, it will surprise some persons to learn that not a single manufacturing industry employs as many persons as are engaged in coal mining throughout the country. In 1889, the last year for which we have complete statistics, 299,559 persons were employed in mining coal. No other mining industry employed 100,000. Iron ore production employed but 38,707. There has been a moderate rise in the river, with a good shipment of coal. Appearances indicate that the December run of coal will be the largest of the year. The output of coal from the Monongahela pools was large, aggregating 3,987,300 bu.; the past two weeks will reach fully 8,000,000 bu. Hundreds of empties arrived and were forwarded to the pools, sufficient to keep the miners busy for some time to come. Will there be a railroad coal strike? Miners are indignant at the 55% rate, decided on by the railroad coalowners, but are opposed to accepting the reduction proposed for the present. Their decision will be learned later.

**CConnellsville Coke.**—Trade continues in an unsettled condition. No material change is looked for during the present month, either in production or demand; changes projected will, no doubt, be acted on early in the new year, the outlook being considerable for a big trade and better prices are predicted. The demand for crushed coke is steadily increasing, keeping the crushers running to their full capacity, but the demand for furnace and foundry coke is changeable and irregular, for the balance of the year is expected to show a falling off. Summary of the week's trade: Ovens in blast, 14,315; idle ovens, 3,265; production estimated at 143,910 tons. The H. C. Frick Coke Company made 6 days at all its plants except three, which made 5 days. The McClure company made 6 days at 9 of its plants; the Rainey made 6 days at 5 plants and 5 days at 2 plants; Cochran made 6 days at 3 plants and 5 days at 1. The independents made 6 days at 6 plants and 5 days at 3 plants. Week's shipments from this region were as follows: To Pittsburg, 1,536 cars; to points east, 2,503 cars; to points west, 3,894 cars; total, 7,933 cars. Shipments in tons, 144,443. Increase in tons, 4,266. Prices unchanged.

**Shanghai, China.** Nov. 9.

(Special Report of Wheelock &amp; Co.)

**Coal.**—The position of affairs in Japan remains unaltered and the expected excessive import is still withheld. Natives are unwilling to buy, partly on account of the high prices ruling and partly for want of any demand here, the market being fairly well stocked. In Cardiff a small lot of about 900 tons Ferndale was disposed of at 12 taels, ex-godown, and there being some 3,000 tons very near at hand and unsold, we can but report a downward tendency in prices. Small lots have changed hands at about 15 taels, and this we consider an extreme quotation. There is no inquiry for Sydney Wollongong, except at a very reduced figure, and we have heard of no fresh transactions. Quotations are, for cargo lots, 12 taels per ton for Cardiff; 12 taels per ton for American anthracite; 11'60 taels per ton for Sydney Wollongong; 11 taels per ton for Newcastle; 7 to 8 taels per ton for Japan, for such as is offered.

**Kerosene Oil.**—We have no feature of special importance to chronicle beyond the sale of a small quantity to arrive at 1'35 taels, and for arrivals some distance ahead we quote 1'34 taels. In spot cargo natives have dealt among themselves at prices varying from 1'32 taels to 1'35½ taels. In Russian there was not much life, and we have heard of no business of any great extent. There have been no arrivals, though some may turn up at any moment. Stocks in godowns now amount to 1,012,115 cases American and 188,394 cases Russian. Quotations are: Devoe's, 1'35 taels per case; Batoum, 1'25 taels per case; Batoum bulk, 1'18 taels per two tins.

**IRON MARKET REVIEW.**

NEW YORK, Friday Evening, Dec. 21, 1894.

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

Fuel used.	Week ending		From		From	
	Dec. 22, 1893	Dec. 21, 1894.	Jan., '93.	Jan., '94.	Tons.	Tons.
Anthracite.	33	16,635	33	21,450	1,362,333	859,257
Coke...	73	77,511	127	147,320	5,307,438	5,126,904
Charcoal...	24	4,540	23	4,770	388,151	214,921
<b>Totals</b>	<b>130</b>	<b>98,716</b>	<b>183</b>	<b>173,550</b>	<b>7,057,925</b>	<b>6,191,185</b>

As we approach the first reckoning day of January the iron market loses what little features of activity it had last week, and becomes simply dull. Our Chicago correspondent reports a like condition in that city, though he notes that there are still a fair number of orders being secured. In Buffalo the market is quiet, with fair selling; in Pittsburg quiet and prices low, and in Philadelphia quiet and steady, with light sales. In the latter city a very small stock of foundry grades is noted.

This is the usual condition at this time of year and, as we have before said, does not portend any permanent change in the growing improvement noted last month. The general opinion of those in a position to judge accurately is that after the opening of the new year there will be an improvement, which will grow steadily, and during the spring months be very active.

In some quarters it has been suggested that the decreased consumption during the holidays will largely increase stocks, and thus tend to hold prices down, but, with such a small quantity of iron as is now in the yards, the surplus for two or three weeks will not be at all likely to have any effect on the market.

**NOTES OF THE WEEK.**

It has been reported that some of the larger Lake ore producers propose to enter into a combination by which the production will be restricted in 1895 and prices advanced. This has been denied by some of the leading mines; but all agree that some plan will likely be followed during the coming year to increase the value of ore. At present certain furnaces are reported to have secured their stocks of Lake ores to last until next fall. In view of this and the fact that coke is being sold for three months' delivery at 90c., and in some cases six months at nearly the same figure, producers who have kept in touch with the market will be able to manufacture at present cost whatever turn may be made in the selling price.

**Pig Iron.**—Owing to the near approach of the holidays and the usual dullness at such time there has been but a light demand in this market. Quotations remain: Northern brands, No. 1 X, \$12.25@12.75; No. 2 X, \$11@12 gray forge, \$10@11; Southern irons, No. 1 foundry, \$11.50@12; No. 2 foundry, \$10.50@11.50; No. 1 soft, \$10.50@11; No. 2 soft, \$10.25@10.75.

**Spiegeleisen and Ferromanganese.**—The market is quiet at \$20.50@21 for 2% spiegeleisen, and \$49@50 for 80% ferromanganese.

**Billets and Rods.**—The market is very quiet and weak. Nominal quotations are \$17.50@18 for billets and \$24.50@25 for wire rods.

**Rails and Rail Fastenings.**—This market is dull, and but little inquiry is noted. Quotations remain: Standard rails at tidewater, \$22.75. In rail fastenings prices remain: Fish and angle plates, 1'20@1'40c. at mill; spikes, 1'40@1'60c.; bolts and square nuts, 2@2'25c.; hexagonal nuts, 2'10@2'30c. delivered.

**Structural Iron and Steel.**—There has been little or nothing done in this market during the week, and it is anticipated in the trade that but little improvement will be noted before the early part of January. Quotations remain: Angles, 1'20@1'35c.; beams up to 15 in., 1'30@1'50c.; channels, 1'40@1'50c. on dock; tees, 1'50@1'60c. on dock.

**Old Material.**—This market is without any features of interest, no sales having been made. Nominal quotations remain: Old steel rails, \$9.50@10; old iron tees, \$10@11 per ton; New York railroad scrap, \$11.50@12 per ton, delivered at mill, and yard scrap at \$10; wrought turnings, delivered at mill, \$8@8.50; No. 1 wrought scrap at \$9.50@10.50 from yard, and machinery cast scrap \$9@10; old wrought tubes and pipe, \$6.50@7; old car wheel, \$9.50@10.50, New York; cast borings, \$6@6.50, delivered at mill.

**Merchant Steel.**—The slightly better buying noted last week has disappeared, and during this week the market has been exceedingly dull. Quotations are: Tool steel, 5'65@6'25c. tire steel, 1'30@1'40c.; toe calk, 1'65@1'75c.; Bessemer machinery, 1'25@1'40c.; open-hearth machinery, 1'85 @2c.; open-hearth carriage spring, 1'70@1'90c.; crucible spring, 3'40@3'65c.; axles, scrap, 1'30@1'50c.; steel, 1'25@1'55c.; bars, common, 1'15@1'30c.; refined, 1'25@1'80c.; steel hoops, 1'45@1'60c. delivered; hooks and pins, 1'40@1'50c.; plates, flange, 1'50@1'65c.; firebox, 2@2'25c.; marine, 2'45@2'70c.; sheared, 1'80c. shell, 1'40@1'50c.; tank, 1'20@1'40c.; universal mill, 1'25@1'40c. delivered.

**Buffalo.**

Dec. 19.

Special Report of Rogers, Brown &amp; Co.

There is quite as much business doing as could be expected at this period of the year, and consumers are, as a rule, endeavoring to run their stocks low for the annual inventory. New business is therefore light, but deliveries on contracts and recent orders are going rather more freely than customary. There has been some pressure to sell from two or three Northern furnaces whose product was not going off as fast as made, which has resulted in making what have been minimum quotations, and we revise our prices accordingly. We quote on the cash basis f.o.b. cars Buffalo, viz.: No. 1 foundry strong coke iron, Lake Superior ore, \$11.25; No. 2 foundry strong coke iron, Lake Superior ore, \$10.75; Ohio strong softer No. 1, \$11.75; Ohio strong softer No. 2, \$11.00; Jackson County silvery No. 1, \$15.75@16.75; Lake Superior charcoal, \$13.75; Southern soft No. 1, \$11.25; Southern soft No. 2, \$11.00; Hanging Rock charcoal, \$18.50.

**Chicago.**

Dec. 19.

(From our Special Correspondent.)

With the coming of the holidays the Chicago iron market has assumed a quieter condition, the sales having grown fewer in most all lines and immediate delivery is asked as a rule. Consumers generally believe that prices will in no instance will go higher during the early part of 1895, and for that reason there is not as much inquiry on wants as is usual at this time of the year.

**Pig Iron.**—Sales in the aggregate of pig iron have not been as heavy as the preceding week, though a good run of orders are coming in. The decrease in the sales is undoubtedly caused by the determination of the sales agents here to keep up the raise in prices agreed on a couple of weeks ago. Had it not

been for this fact the sales of the week would have been very heavy. The price of pig iron in Chicago for the past six months or more has been doubtless lower than any other market in this country, and at such prices the furnaces have found but little profit, therefore now that an increase of from 25 to 50c. per ton has been made the furnaces are sticking to it despite the fact that this business has been somewhat curtailed. In Southern iron consumers are buying in such quantities that will fill out the year's requirements. There is a rumored sale of Southern No. 1 foundry iron of 1,000 tons at about \$10.15 Chicago. Prices are per gross ton f. o. b. Chicago: Lake Superior charcoal, \$13.50@14.50; Lake Superior coke No. 1, \$10.25@10.50; No. 2, \$10@10.25; No. 3, \$9.75@10.00; Milwaukee Scotch No. 1, \$11; No. 2, \$10.75; Jackson County silveries, \$14.50@15; Southern coke, foundry, No. 1, \$11@11.25; No. 2, \$10.25@10.50; No. 3, \$10@10.25; Southern coke, soft, No. 1, \$10.25@10.50; No. 2, \$10@10.25; Southern car-wheel iron, \$17.50@18; Southern silveries No. 1, \$11.50@12; No. 2, \$11.50@12; Tennessee charcoal No. 2, \$14@14.50. Bessemer, \$10.50@11; Ohio strong softeners, \$13@13.50.

**Structural Material.**—The demand for structural material is light, being about equally divided between building and bridge shapes. Quotations are f. o. b. Chicago: Angles, 1'45@1'50c.; tees, 1'65c.; universal plates, 1'50@1'55c.; beams and channels, 1'50@1'60c.

**Plates.**—Business in plates appears to be holding well, and the inquiry would indicate a continued good business for a time in 1895. Prices are rather low and the mills are disposed toward refusing business. Prices are: Flange steel, 1'65@1'75c.; fire-box steel, 1'95@4'50c.; tank steel, 1'40@1'50c.; boiler tubes, 70 to 75% discount.

**Merchant Steel.**—The past week's business has footed up a fair total and prospects for 1895 are very good. Inquiry for implement and other manufacturers indicates a very good January business. Prices are, carload lots: Smooth-finished machinery, 1'75@1'90c.; tire steel, 1'60@1'70; Bessemer bars, 1'40@1'45c.; toe calks, 2'10@2'20c.; crucible spring, 3'40@3'65c.; tool steel, 5'45@5'65c.; specials, 10'50@11'50c.

**Black Sheet Iron.**—Trade in black sheet has been quiet and inquiry does not bespeak much for January trade. Mill lots are for No. 27, 2'35@2'40c. f. o. b. Chicago.

**Bar Iron.**—The sales of bar iron have decreased considerably for the week. Consumers evidently are awaiting the new year before buying more freely. Common iron continues to sell at from 1'05 to 1'10c., and refined, 1'15@1'20c.

**Billets.**—The demand has not increased any, presumably from the fact that price does not seem to fit dealer or consumer. Quotation is yet \$17.

**Steel Rails.**—There is a little better inquiry which tends toward a good business the early months of 1895. Quotations are \$25@27.

**Old Rails and Wheels.**—No change has been noticed in this market, trade being dull. Prevailing prices being for old iron rails \$10.75@11; and for car wheels, \$9.

**Scrap.**—But little business is being transacted in scrap, the market being very dull. Quotations are: Forge, \$8.50@9; cast-iron borings, \$3.50; wrought iron turnings, \$4@4.50; axle turnings, \$6.50; mixed steel, \$5.50; tires, \$12.50@13; iron axles, \$1.

**Philadelphia.**

Dec. 21.

(From our Special Correspondent.)

**Pig Iron.**—Consumers of pig iron have been urged pretty strongly during the past three days to order iron for next year's delivery. One argument used by sellers is that there must of necessity be such a general demand for iron next month that all concessions at least will be withdrawn. The bare probability of this has had a steadying effect. Sales of iron have been light, but a good many offers are under consideration. Forge iron and Bessemer pig from present indications will meet with better demand, but this is only an opinion. Foundry irons are certainly dull just now, yet the yards are so depleted that an active demand might be expected at any time. Bessemer is \$12; No. 1, \$12.50; No. 2, \$11.50, and forge, \$10.50.

**Muck Bars.**—The market is quiet at \$18.50.

**Steel Billets.**—Prices are said to have weakened under reports from western Pennsylvania. This strengthens the unwillingness of buyers to place large orders. The quoted price is \$17.50. A great deal of stock will be wanted next month and buyers imagine they will get supplied at \$17. They may pay \$18 before they pay \$17.

**Merchant Iron.**—The market is quiet and most mills will be idle for a week undergoing repairs, as the phrase goes, though very little repairing is needed. Prices run from 1 to 1'20c., depending on amount wanted, how and what quality.

**Nails.**—The market is dull. Nails can be had at 75 at mill.

**Skelp.**—The anxiety for business led to a further shading of prices since Monday on January deliveries, but the parties concerned decline to name the figures.

**Merchant Steel.**—Retail sales have dwindled to very small proportions.

**Pipes and Tubes.**—There are assurances of two or three large orders next month. Mills are pretty well fixed for the present.

**Plate and Tank.**—Orders for some 1,200 tons were placed this week, but at figures which cannot be given. It is understood two or three more orders may be placed next week, as the prices named are low enough.

**Structural Material.**—Business is looking up and orders have been placed already on account of some large enterprises. There is no stir just now. Quotations have been made on a good deal of material.

**Steel Rails.**—This market is quiet and orders small. Quoted \$22.

**Old Rails.**—Iron are quoted at \$12, and axles at \$15.

**Pittsburg.** Dec. 20.  
(From our Special Correspondent.)

**Raw Iron and Steel.**—The market at present is very difficult to describe, there is such a wide difference of opinion. One thing seems very evident, that prices for leading descriptions have touched bottom—that further concessions are out of the question; many producers say that they will shut down before they will consent to any further concessions. This is pretty strong talk, but there can be no question about this being in dead earnest. Reports are current of some large transactions of billets for 1895, delivery at buyer's works, said to be 40,000 tons, about \$15.50 per ton. One of the Valley furnaces closed a contract with one of our Pittsburgh mills for all the Bessemer they could make January and February at \$10 10 delivered at buyer's mill; another mill purchased 3,500 tons billets and slabs for next year's delivery at maker's mill, \$15.05.

**Pig Iron.**—When it is considered that consumers' yards are very generally bare of stocks, and that the present accumulation at the furnaces is not much more than two weeks' supply during periods of ordinary activity, the slight accumulated material is unimportant in a general way, although there is apparently more pressure to realize on the part of sellers.

**Steel Rails.**—Great hopes are based upon the orders that must be given by the railroads and that should be placed now, but have been deferred until after the new year puts in an appearance; but the policy of the railroad officials seems to be to do nothing until absolutely compelled to do so. This time has been fixed by the iron men as next spring, and they are counting upon considerable business then, but in the mean time the extreme competition for orders continues at the expense of prices.

For finished material the demand is affected by the usual holiday dullness which is felt more keenly this year than usual; some mills are nearly out of orders and with strong competition see but little prospect of booking desirable business in the near future.

COKE SMELTED LAKE AND NATIVE ORE.		CHARCOAL.	
Tons.	Cash.	No. 2 Foundry	16.00
3,000 Bessemer, Jan.		50 No. 3 Foundry	16.00
3,000 Bessemer, Feb.	\$10.25	50 Cold Blast	23.50
3,000 Bessemer, Jan.	10.30	50 Cold Blast	23.25
2,500 Bessemer, Dec.	10.20	25 No. 2 Foundry	16.25
2,000 Bessemer, Jan.	10.20	25 No. 4 Foundry	16.00
2,000 Bessemer, Feb.	10.25		
2,000 Bessemer, Jan.	10.30	MUCK BAR.	
1,000 Mill Iron, Dec.	9.35	500 Neutral, Dec.	18.25
1,000 Bessemer, Dec.	10.15	300 Neutral, Dec.	18.40
800 Gray Forge	9.30	STEEL WIRE RODS.	
500 Bessemer	10.40	1 000 5 gauge, American	21.50
500 Mill Iron	9.30	at mill	
500 Gray Forge, Dec.	9.35	SKELEP IRON.	
300 No. 1 Foundry	11.50	1,000 Wide gr'v'd	115 4 m.
300 No. 2 Foundry	10.50	500 Wide gr'v'd	110 4 m.
300 Bessemer, spot	10.75	400 Sheared	110 4 m.
150 No. 1 Silvery	13.60	SHEET BARS.	
100 No. 2 Silvery	12.50	300 at mill	21.00
50 No. 1 Foundry	11.00	BLOOMS, BILLETS, BAR ENDS.	
50 No. 2 Foundry	10.50	1,000 Blooms and Billet	10.40
		Ends	
		100 Western	3.25
		SPELTER.	
		500 Steel rails, long	10.50
		350 Iron rails	12.50
		250 No. 1 R. R. W.	
		scrap, net	10.00
		200 Cast borings, gross	6.25
		200 Wrought turnings,	
		gross	7.50
		150 Broken wheels,	
		gross	11.00

**METAL MARKET.**

NEW YORK, Friday Evening, Dec. 21, 1894.  
**Gold and Silver.**

Prices of Silver per Ounce Troy.

December.	St. Ex.	London	Pence.	N. Y. Cts.	Value of sil. in \$.	December.	St. Ex.	London	Pence.	N. Y. Cts.	Value of sil. in \$.
15	4.88 1/2	27 1/2	60 1/2	.469	19	4.88 1/4	27 1/2	61	.464		
17	4.88 1/2	27 1/2	60 1/4	.466	20	4.88 1/4	27 1/2	60 3/4	.467		
18	4.88 1/4	27 1/2	59 3/4	.463	21	4.88 1/2	27 1/2	60	.464		

Silver has been steady during the last week. Orders have been chiefly on account of India; ship-

ments from New York this week have been larger than usual, owing to less demand for the East via San Francisco. During the holiday season dullness is likely to prevail, with some decline in prices.

The United States Assay Office at New York reports the total receipts of silver at 161,000 oz. for the week.

**Gold and Silver Exports and Imports.**

At all United States Ports, November, 1894, and Eleven Months, 1894 and 1893.

	Gold.		Silver.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Nov.	\$119,993	\$1,919,600	\$3,601,589	\$670,554 E.	\$1,431,430
1894.	92,009,321	20,213,610	43,348,728	8,979,906 E.	106,161,533
1893.	77,121,275	72,016,144	41,043,039	17,342,785 E.	28,805,325

Exports and imports of gold and silver in ores for November and the 11 months to November 30th are reported as follows:

	November		Year—	
	1893.	1894.	1893.	1894.
IMPORTS:				
Gold	\$27,681	\$61,012	\$169,711	\$702,515
Silver	567,391	107,009	8,733,865	6,293,735
Total imports	\$595,073	\$168,101	\$9,703,579	\$6,996,251
EXPORTS:				
Gold and silver	9,702	.....	264,543	225,667
Excess of imports	\$585,361	\$168,101	\$8,939,034	\$6,770,584

The statement includes all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

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

For the week ending December 15th, 1894, and for Years from January 1st, 1894, 1893 and 1892.

Week	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1894.	\$3,594,971	\$57,472	\$577,158	\$19,565 E.	\$4,065,992
1891.	90,426,404	16,386,437	32,051,026	1,655,388 E.	14,425,612
1893.	72,716,310	62,803,435	31,887,594	3,131,309 E.	38,609,075
1892.	65,152,349	8,449,907	22,161,658	2,979,638 E.	76,884,412

The gold imported for the week came from the West Indies; the silver from Central America. The gold exported went to France with the exception of \$60,000 to the West Indies; the silver went to London.

During the five days ending December 20th the imports and exports of gold and silver from the port of New York were as follows: Imports, gold, \$46,733; silver, \$16,302. Exports, gold, \$2,514,500; silver, \$563,400.

All the gold exported was in American coin, \$750,000 of which went to France, \$1,750,000 to Germany, and \$14,500 to the West Indies. Of the silver exported, \$15,350 was in Mexican coin, all of which went to South America; \$49,000 was in Peruvian coin and went to South America, while a remaining \$499,650 was in American coin and bullion, all of which went to London. There were also \$9,500 in Mexican dollars in transit to London.

**FINANCIAL NOTES OF THE WEEK.**

Business is in a somewhat uncertain state, and we can hardly say that any improvement is to be noted during the present week. The renewal of gold exports and the unsettled condition of the currency have had a depressing effect, and have checked, to some extent, the increase in the volume of general trade which we have had occasion to note for some time past. On the other hand, however, there are some encouraging systems. Our market reports continue to show an improvement. The railroad traffic also shows a steady, though not large, proportion of gain. The fact, which we have noted several times before, that the trunk-line reports indicate an increased movement of freight westward, shows that business in manufactured goods is still on the increase.

The main point, to prevent any further check and to secure a continuous gain, is to press forward the reform of the currency. On this point some remarks will be found this week on our editorial page.

Gold shipments have been continued during the present week, though not fully to the extent anticipated in some quarters. The amount taken, so far as can be ascertained to-day, for shipment by tomorrow's (Saturday's) steamers is \$2,500,000, part of it going to France and part to Germany. The amount may be slightly increased, though it is not believed that any important additions will be made to it.

The hearings on the Carlisle bill before the House Banking Committee were closed on Saturday last, and the committee at once took up the consideration of the form under which the bill would be reported to the House. The first proposition was to report the bill in complete form and to endeavor to force its passage through the House immediately, but the differences of opinion found forced some alteration in this plan. The preliminary report was submitted to the House on Monday, December 17th, and on the following day debate was begun. As objection had been made to the committee's request for unanimous consent that the general debate should be closed with the adjournment of the House for the holiday recess, it began without any agreement for the limitation. As there are a large number of speakers to be heard, and there are many differences of opinion, and as the House has also devoted one or two days to other business, it has

become apparent that no action will be taken before the recess, and in fact it looks now as though the House would not be likely to reach a vote before the middle of January at the earliest. It is also within the range of possibility that the bill may be referred back to the committee to be reported in an amended form. That many amendments will be offered is certain, and that some will meet the favor of the House is very probable indeed. The most radical amendment prepared is one submitted by Mr. Bland, which in effect would substitute for the whole measure a free silver coinage bill. In the present temper of the House this has no chance for adoption.

To-day (Friday) it is announced that the majority of the members of the Currency Committee have decided to withdraw the Carlisle bill and to present a substitute to the House. The decision was reached after a sharp discussion on the ground that a new measure would stand a much better chance of passing the House without amendments. The most important features in the substitute are to be that the national banks may continue under the present system without rearranging their currency issues under the new system, should they wish to do so. In other words, the adoption of the new system of issue will be made voluntary. The other is that banks will not be subjected to assessments to make up the safety fund which is to provide for the issues of failed banks. Other changes are proposed, but not yet decided on.

The statement of the New York banks for the week ending December 15th shows increases of \$413,175 in surplus reserve, and \$6,375,900 in specie; decreases of \$862,200 in loans, \$6,244,370 in legal tenders, \$1,246,300 in deposits, and \$29,900 in circulation. The total reserve was \$171,546,800, being \$32,345,825 in excess of the legal requirements. The bank statement is now returning to its normal condition as the transactions connected with the bond issue are gradually being adjusted on the books. This accounts for the decrease in loans to a large extent. The reserve, it will be noticed, is gradually approaching to normal proportion to liabilities; although still high it is much less than half what it was a year ago, and is in fact lower than it has been any time this year. Part of this is doubtless due to the increasing employment for money here, and part also to the withdrawal of the deposits of out-of-town banks, which are beginning to find better use for their money at home.

The exports of merchandise from the United States in November, as reported by the Bureau of Statistics of the Treasury Department, amounted to \$80,128,825, a decrease of \$11,521,171 from November of last year. This decrease is in part due to lighter exports of grain, and in part to lower prices and valuations. Imports for the month were \$50,554,534, showing an excess of exports of \$29,573,891, which compares with a corresponding excess of \$42,981,706 last year. For the 11 months ending November 30th, the merchandise exports and imports were:

	1893.	1894.
Exports	\$782,292,509	\$740,220,585
Imports	717,120,478	610,215,999
Excess, exports	\$65,172,031	\$130,004,586

The excess of exports was thus very nearly double that of last year. The gold and silver exports will be found in the usual table at the head of this column.

The statement of the United States Treasury on Thursday, December 20th, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

	Dec. 13.	Dec. 20.	Changes.
Gold	\$104,888,022	\$93,210,134	D. \$11,677,888
Silver	7,730,435	7,535,732	D. 194,703
Legal tenders	2,641,781	32,314,493	I. 9,672,712
Treasury notes, etc.	27,084,632	27,059,320	D. 25,312
Total	\$162,344,860	\$160,119,679	D. \$2,225,181

The large decrease in gold shows the extent to which withdrawals in exchange for legal tenders have been made. The gold balance has fallen \$17,349,689 since December 6th, when it was about the highest point after the bond issue.

The coinage at the San Francisco Mint for November and the eleven months to November 30th was as follows, values only being given:

	November.	Year.
Double eagles	\$2,040,000	\$18,935,160
Eagles	.....	251,000
Half eagles	.....	179,500
Total gold	\$2,040,000	\$19,464,000
Standard dollars	\$150,000	\$1,160,000
Half dollars	120,000	1,787,948
Quarter dollars	50,000	604,205
Dimes	.....	3
Total silver	\$320,000	\$3,552,156
Total value	\$2,360,000	\$23,016,656

The total value of coinage in 1893 was \$2,449,240 in November and \$21,197,774 for the eleven months, showing an increase in the work this year.

The Treasury Department has issued the following circular to collectors and other officers of the customs: Article 708 in Section 7 of the Customs Regulations of 1892, which provides that upon the exportation of metal, smelted and refined in bonded

establishments, credit will be given on the warehouse bond for the duties on the "quantity of the imported crude metals or ores shown by the assay, and 10% of the quantity so shown in addition thereto," is hereby so amended as to reduce said addition to 8% in the case of pure metals obtained from imported ores, and to 2% in the case of pure metal obtained from crude metals imported in any other form. The regulations contained in said Section 7, including Article 8, as hereby amended, will be equally applicable to bonded smelting and refining warehouses established under the provision of Section 24 of the act of October 1st, 1890, and to similar warehouses established under the provisions of Section 21 of the act of August 28th, 1894.

The total Treasury receipts for the week ending December 15th are given below, in comparison with those for the corresponding weeks in 1893 and 1892:

	1892.	1893.	1894.
Customs.....	\$1,082,033	\$2,156,611	\$2,622,201
Internal revenue.....	3,329,813	3,011,532	2,232,528
Miscellaneous.....	386,683	628,573	490,519
Total.....	\$7,992,529	\$5,796,736	\$5,345,248

The receipts, though they show some improvement over November, were less by about \$700,000 than those of the first week of the current month.

The Bank of England on Thursday, December 20th, reported its total gold holdings at £33,362,389, an increase of £8,360,910 over the corresponding date last year. The bank has gained slightly this week, its proportion of reserve to liability being 63.67%, against 63.28% last week and 59.19% a year ago. This, however, is due chiefly to the decrease in liabilities, as there was a net decrease of £381,000 in coin and bullion during the week. Receipts from Australia were large. The exports to France have almost ceased for the time; but those to other countries have increased, one item of £204,000 to South America being reported.

The Bank of France on Thursday, December 20th, reported its total specie holdings at 2,062,505,000 fr. gold and 1,242,131,000 fr. silver; an increase of 349,235,087 fr. gold and a decrease of 26,521,434 fr. silver as compared with the corresponding week last year. Changes during the week were increases of 27,600,000 fr. gold and 2,925,000 fr. silver. The Bank's gain in gold continues, although it is not quite as marked as last week.

Specie holdings of other European banks on Thursday, December 20th, are reported by cable to the "Journal of Commerce" as below:

	Gold.	Silver.	Total.
Imp. Bank of Germany.....			\$212,085,000
Austro-Hungarian Bank.....	\$75,524,000	\$70,812,000	146,336,000
Netherlands Bank.....	20,416,000	34,369,000	54,785,000
Belgian National Bank.....			25,852,000
Bank of Spain.....	40,021,000	54,524,000	94,545,000

The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately. The latest report from the Imperial Bank of Russia, of date November 8th-20th, gives their holdings at \$214,032,000 gold and \$113,092.

Shipments of silver from London to the East for the year up to December 7th are given by Messrs. Pixley & Abell's circular as below:

	1893.	1894.	Changes.
India.....	\$6,276,051	\$4,728,213	D. \$1,547,838
China.....	2,925,216	2,711,771	I. 213,445
The Straits.....	1,525,213	1,189,746	D. 335,467
Total.....	\$9,826,480	\$8,629,730	D. \$1,196,750

Shipments for the week included £136,000 bar silver to India and £2,600 in Mexican dollars to the Straits. Imports of silver included £4,900 from Australia, £3,000 from Brazil and £110,000 from New York.

Indian exchange continues weak, and the average price of Indian Council bills has declined to a fraction above 12½d. per rupee. A somewhat unexpected feature of the depression is that the low price of silver has not operated to draw out gold in the Indian markets. While the amount of gold hoarded has hardly been touched by the sales made early in the year, there has apparently grown up a disposition among the natives to hold onto it, and even the temptation of the low relative price of silver has not brought out any considerable amount during the last two months. The exports of gold from China have shown a considerable increase this year, while its imports of silver have increased.

#### Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars.....	\$0.50	\$0.51
Peruvian soles and Chilean pesos.....	48½	50
Victoria sovereigns.....	4.87	4.89
Twenty francs.....	3.85	3.88
Twenty marks.....	4.75	4.78
Spanish 25 pesetas.....	4.80	4.84

#### Other Metals.

**Copper.**—The firmness has made further progress, and our market acted entirely independent of the fluctuations in London, where for some little time the tendency had been rather flat and depressed. Producers as well as holders from second hands were so firm that consumers who were and partly still are very badly in want of copper had nothing left to them, but to pay the prices

asked, and we are now in a position to report that sales of Lake copper have been made at 10c. by the Calumet & Hecla company. It is not known what quantities have been placed at this price, but it is said that they are further sellers thereat, and this has now established the price for Electrolytic copper, which we have to quote, 9½@9%, with rather few sellers at the former figure. For Casting copper the price is now 9.40@9.50c., with no pressure at all to sell; and with good consumption now prevailing, we may look for a fairly active market after the holidays are over.

In London prices for G. M. B's declined early in the week to £40 12s. 6d., but after this a good buying demand set in, and prices close very firm at £41 2s. 6d. @ 5s. for spot and £40 10s. @ 12s. 6d. for three months prompt. For refined and manufactured we quote: English tough, £12 15s. @ £13; best selected, £13 5s. @ £13 10s.; strong sheets, £51 @ £51 5s.; India sheets, £48 @ £48 5s.; yellow metal, 4¼d. We hear that manufacturers abroad are fairly supplied with orders.

**Copper Exports.**—The exports of copper from the port of New York for the week ending December 20th, as reported by the New York Metal Exchange, were as follows:

London—Europe.....	Pigs	25 tons
Hamburg—Persia.....	Plates	45 "
Antwerp—Nordland.....	Plates	40 "
Rotterdam—Spainandam.....	Plates	57 "
Liverpool—Cevic.....	Pigs	125 "
London—Europe.....	Pigs	25 "
Liverpool—Adriatic.....	Pigs	45 "
Rotterdam—Amsterdam.....	Pigs	105 "
Matte:		
Liverpool—Cevic.....		410 "

Exports of copper from Baltimore for the week ending December 20th are reported by our special correspondent as follows:

Rotterdam—Urbino.....	4,277 ingots	67,200 lbs.
—Ohio.....	650 bars	113,873 "
—	89 cakes	22,560 "
Antwerp—Rialto.....	38 "	33,915 "
—	7,018 ingots	112,000 "
Hamburg—Bohemia.....	755 bars	112,402 "
Bremen—Braunschweig.....	293 "	44,807 "

Other metals exported during the week were: 44 barrels chrome iron ore, 50,360 lbs., to Liverpool; 78 barrels sulphate copper, 44,850 lbs., to Hamburg;

**Imports and Exports of Metals.**—Imports of metals into this port for the week ending December 13th are reported by the New York Metal Exchange as follows: 175 tons tin from London; 25 tons Banca tin from Holland; 500 tons lead, duty paid, from Antwerp; 10 tons Silesian spelter from Stettin.

Exports of metals (other than copper) from this port for the week ending December 13th are reported by the New York Metal Exchange as follows: 20 tons tin scrap to Antwerp; 78 tons tin scrap to Rotterdam; 3 tons spelter to Naples; quantity old brass to Liverpool; 70 tons scrap iron to Glasgow; 40 tons nickel to Hamburg; 22 tons scrap brass to Hull.

**Tin.**—There is a decidedly better feeling, and values have hardened somewhat. Spot stocks are held very firmly, but what is pressing on the market is the fact that for the next three months heavy shipments are expected from the East, and, considering the already overstocked market in Europe and in this country, this is rather a bad feature. Besides, the declining market for silver makes the laid-down price in this country and London rather cheaper. We quote 14c. for spot and futures.

Messrs. De Monchy & Havelaar's circular gives the supply of tin from Banca, Billiton and the Straits for the 11 months ending November 30th at 13,697 long tons, and the deliveries during the same period at 11,611. The total unsold stock in Holland and afloat on November 30th was estimated at 5,616 tons.

Exports of tin from Holland for the ten months to October 31st were 9,946 long tons, against 10,024 tons last year and 9,157 tons in 1892.

The British Board of Trade returns for the ten months to October 31st gives the following figures in long tons:

	1891.	1892.	1893.	1894.
Imports of foreign tin.....	23,089	23,867	27,137	32,755
Exports of English tin.....	4,461	4,695	5,746	4,790
Exports of foreign tin.....	12,213	13,591	17,000	17,256

Exports of tin plates for the ten months were 283,768 tons, against 328,769 tons last year, 331,828 tons in 1892, and 392,210 tons in 1891.

Lead has experienced a further decline, and the market closes very weak, with sellers at 3.05 New York for spot and forward delivery. An active business has again been done, and consumers appear to have confidence in present prices, being free buyers. It is considered that present values, together with the lower prices for silver, will check production in the West quite considerably.

The London market had a fluctuating tendency toward the end of last week; there were buyers for Spanish at £9 15s., but since then prices declined somewhat, and the closing quotations are for Spanish £9 11s. 3d. @ £9 12s. 6d. and English lead 2s. 6d. higher.

**St. Louis Lead Market.**—The John Wahl Commission Company telegraphs us as follows: "Lead dull and gradually dropping. Latest sales has a 2.80c. for January and 2.82½c. for prompt. Chemical is still held at 2.87½c., but it is generally understood some sellers would accept 2.85c. if the opportunity presented itself to sell a round lot."

Spelter is rather dull, and Western producers are offering freely to consumers on the basis of 3.30 New York.

The London market after a short period of firmness has also shown a declining tendency, evidently because the combination which was expected to reorganize failed to do so, and we quote ordinaries £14 17s. 6d. and specials £14 10s.

**Antimony.**—Closes neglected, and is pressed for sale. Cookson's is quoted at 8½; L. X. Sc., Hallet's 7½@7%; U. S. French Star 9c.

**Aluminum.**—Current quotations are unchanged as follows, No. 1 being over 98% pure metal, and No. 2 over 94% pure: No. 1 in rolling ingots, 63c. per lb. for small lots at factory; 60c. in 100 lb. lots; 58c. in ton lots. No. 1 in ingots for remelting, 60c. for small lots, 55c. for 100 lb. lots, and 53c. in ton lots. No. 2 in ingots for remelting, 55c., 53c. and 50c. per lb., according to size of order. Sheets, 80c. @ \$4.40 per lb., according to size and thickness. Wire, \$1 @ \$2.50 per lb., according to gauge. Castings, 90c. per lb. up, according to number, weight, patterns, etc. Tubes, from 20c. to \$3.15 per foot, according to thickness and diameter.

Abroad quotations for 99% pure metal in Paris are 7 fr. per kilo, for ingots; 8 fr. and upward for sheets; 11 fr. for wire over 0.5 mm. and 19 fr. for tubes. The Neuhausen Company quotes No. 1 (guaranteed 98% pure, and in fact 99.75%) at 5 fr. per kilo, for ingots in small lots; for large lots a considerable discount is allowed. This price is at the works in Switzerland.

**Bismuth.**—No late sales in New York are reported. Quotations are nominal at \$1.95 @ \$2.40 per lb., according to quantity.

**Magnesium.**—No quotations are to be found for this metal in New York, where sales are usually made in small lots for special purposes only, and on private terms. Prices in Germany are, for lots of over 10 kilos: Ingots, \$6.75 per kilo; bars, \$6.50; powder, \$9, ribbon and wire, \$9.50. For orders of less than 10 kilos, 25 cents per kilo, must be added for ingots or bars, and 50 cents for ribbon, wire or powder. These prices are delivered at works; the Aluminum und Magnesium Fabrik, Hemelingen, Germany, is the only maker of the metal in commercial quantities.

**Nickel.**—Sales reported are all on private terms. Quotations are nominal at 38½@44c. London quotations are 16@17d. per lb., and somewhat firmer. In Paris no change is reported; pure metal is quoted at 4.75@5 fr. per kilo, equal to about 41½@43½c. per lb. Copper-nickel alloy, 50% nickel, 2.75 @ 3 fr. per kilo.

**Phosphorus.**—Quotations are steady at 50@53c. f. o. b., New York or Philadelphia.

**Platinum.**—Abroad the prices continue firm, with an upward tendency reported.

For chemical ware, hammered metal, Messrs. Eimer & Amend, New York, quote crucibles and dishes 41c. per gram for orders of over 250 grams; 43c. for orders of 100 grams or over, and 45c. for small lots. Wire and foil are 40c., 41c. and 42c. per gram, respectively, for orders of the quantities named. Current retail prices for crucibles are 50c. per gram.

**Sodium.**—In England and Germany makers quote 85@95c. per lb., according to quantity. Sales in this market are too small furnish quotations.

**Quicksilver.**—There is no change to report in quicksilver. Quotations are: New York, \$36; London, second-hands, £6 10s.; Rothschild's price, £6 12s. 6d. The receipts of quicksilver at San Francisco, Cal., during November of this year amounted to 2,490 flasks, against 2,342 flasks for November, 1893, and 1,856 flasks for the same month in 1892. For the 11 months ending November 30th, 1894, the total receipts were 22,944 flasks, as against 22,901 flasks for the same period last year. The shipments by sea from that port in November last amounted to 2,190 flasks, valued at \$74,998, of which 1,600 flasks went to New York and 585 flasks to Mexico. The quantity of quicksilver sent to New York during the first 11 months of 1894 is greater by 1,650 flasks than in 1893. China and Mexico have each taken about 1,000 flasks more than last year, while shipments to Australia show a decrease of 1,227 flasks.

#### CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Dec. 21, 1894.

**Heavy Chemicals.**—The usual holiday quietude prevails in the heavy chemical market. Little or no business is doing, and there is no change or features of interest to report this week. Prices remain as last quoted. In alkali and carbonated soda ash there is no spot business doing, the trading being deliveries on existing contracts. Bleaching powder is quiet on the spot; but a fair business for delivery next year has been done. Quotations this week are as follows: Caustic soda, 60%, 2.10 @ 2.25c. for spot; futures 2c. and upward; 70 to 74%, 2.05 @ 2.30c. Carbonated soda ash, 48%, is 5c. @ \$1, according to quantity and delivery; small parcels range higher. Alkali, 48%, is 97½@1c., with special makes at 1@1.05c. Bicarb is 2@2½c. for spot. Bleaching powder is 1.75 @ 1.90c. for English; 1.5 @ 1.65 for German and Belgian. Sal soda, 70 @ 75c. for domestic.

**Acids.**—The acid market continues dull. The jobbing trade is quiet, as it usually is just before the holidays. Business for next year's delivery has been slower than usual, and comparatively few contracts of importance have been signed. The reason for this is that consumers have become accustomed to buying at low prices. Values are so low now that the manufacturers are not at all anxious to contract ahead to any extent, feeling convinced that there is

little possibility of a further decline. Thus both buyers and sellers are not particularly anxious to contract heavily.

The report that some of the large Western makers had arrived at an agreement by which better prices were to be upheld is denied by the officers of two of the largest concerns.

There is no change in prices and we quote per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acids, acetic, \$1.40@1.65 (in barrels). Muratic, 18", 80@90c.; 20", 90c.@1.15; nitric, 36", \$3.25@4; 40", \$4@4.50; 42", \$4.50@5.25. Mixed acids according to mixture: oxalic, \$7@7.50. Sulphuric, 60", 60@70c.; 66", 70@85c. Blue vitriol is quoted at \$3.25@3.50.

**Brimstone.**—The market for Sicilian brimstone continues very quiet. Prices are without any change. We quote this week: Best unmixed seconds, on the spot, \$17; shipments \$16.50. Best thirds are \$1 less.

**Fertilizing Chemicals.**—We hear of little or no business doing in fertilizers just now. Sales are few and far between and small in volume. The ammoniates, owing to the small demand and the heavy stocks, are weaker. Our quotations this week are as follows: Sulphate of ammonia, gas liquor, \$3 30 @ \$3.35; bone, \$3.20. Dried blood, high grade, \$2.10 @ \$2.15; low grade, \$2@2.05. Azotine, \$2.10@2.12½. Concentrated phosphate (30% available phosphoric acid), 75c. per unit. Acid phosphate, 13% to 15%, av. P<sub>2</sub>O<sub>5</sub>, 57c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P<sub>2</sub>O<sub>5</sub>, 90c. per unit. Acidulated fish scrap, \$12.50@13, and dried scrap with few or no sales, nominally \$21 f. o. b. fish factory. Tankage, high grade, \$21@21.50; low grade, \$20. Bone tankage, \$22; ground bone, \$20. Bone meal, \$23@24.

In lots of 50 tons on contracts we quote: Double manure salts, 48-53% (basis of 48%): New York and Boston, \$1.12; Philadelphia, \$1.14½; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$1.17. High grade manure salts, 90-95% and 96-99% basis 90%), respectively: New York and Boston, \$2.07@2.11; Philadelphia, \$2.09½@2.13½. Charleston, Savannah, Wilmington, N. C., and New Orleans, \$2.12@2.16.

**Phosphate Rock.**—Quotations at Charleston, S. C., are: \$4 for standard land, kiln dried rock; ground rock, in buyer's bags \$5.50@5.60, in seller's bags \$1 higher.

**Muriate of Soda.**—Arrivals of concentrated potash salts at the various ports during the past week are probably as large as have ever been reported. They aggregate about 5,000 tons. These heavy arrivals are due to the desire of finishing deliveries on this year's contracts. Prices for 1895 have not yet been fixed by the Syndicate. Quotations for lots of 50 tons are as follows: 80-85% and minimum 95% (basis 80%), respectively: New York and Boston, \$1.78@1.91; Philadelphia, \$1.80½@1.83½; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$1.83½@1.86.

**Kainit.**—Prices for kainit (minimum 23%) in cargo lots for 1894 delivery are nominally unchanged and are as follows for invoice and actual weights respectively: New York, Boston and Philadelphia, \$9@9.25; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$9.75@10. For sylvinit, 27-35%, prices are as follows, per cent. per gross ton, invoice weight: New York, Boston and Philadelphia, 37½c.; Charleston, Savannah, Wilmington, N. C., and New Orleans, 41c. Actual weight, 1c. more per cent. There is a little better demand, but not enough to warrant an increase.

**Nitrate of Soda.**—Quotations this week are: Spot, \$2@2.05; near-by arrivals, \$1.95@2, according to position; shipments next year, \$1.85.

**Charleston, S. C.** Dec. 18.

(From our Special Correspondent.)

Shipments of phosphate rock from Charleston for November were as follows, in tons:

	1892.	1893.	1894.
Crude rock.....	15,049	18,739	9,142
Ground.....	510	.....	.....
Total, tons.....	15,559	18,739	9,142

No improvement in the trade can be reported at present, the market for both rock and fertilizers remaining very dull.

**MINING STOCKS.**

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Colorado Springs, Colo.; Duluth, Minn.; Helena, Mont.; Baltimore, Philadelphia, Pittsburg, London and Paris, see pages 598 and 600.]

**NEW YORK, Friday Evening, Dec. 21.** There was but little demand for mining stocks this week. The approach of the Christmas holidays always has a depressing effect on this market, since very few people regard mining stock certificates as desirable Christmas presents. We understand that a well known broker has presented to a member of his family \$1,642,500 in mining stocks, the current market value of which is variously estimated all the way from 18c. to 39c., although it is said that the fluctuations in the stock must be governed by the market for old paper, which is just now weak.

The Comstock has been quiet during the past week, and prices have not fluctuated very much, although they close lower than last Friday. Consolidated California & Virginia declined from \$3.95 to \$3.70, with sales of 416 shares. To day, despite the recently declared dividend, only \$3.40 was bid for this stock. Of Comstock Tunnel 1,600 shares were

sold at 4@6c. Hale & Norcross declined from 85c. to 67c., with sales of 300, and at the close 65c. was bid for it. Other sales were: 100 shares of Crown Point at 75c.; 200 shares of Savage at 37c., 100 shares of Sierra Nevada at 68c.; 100 shares of Yellow Jacket at 44c.; 100 shares of Mexican at 62c.; 200 shares of Union Consolidated at 32c.@38c., and a lot of 500 shares of Utah at 15c.

None of the California stocks was traded in during the week. The Standard Consolidated Mining Company, of Bodie, has stopped operations at the cyanide plant on account of the freezing weather which prevails there. The company is unable to utilize its water power on account of the "freeze-up," and is now using wood and is therefore working only on its high grade ore. We understand that the company, which paid a dividend of 10c. a share on the 20th inst., will declare a new one before long, although one of the directors stated to a representative of the "Engineering and Mining Journal" that the dividend would not be declared before next February.

Of the Colorado stocks the only one to show any transactions this week was Lacrosse. This stock was in very fair demand, and 3,400 shares changed hands at 6@7c.; it closed firm at the latter quotation. The Knickerbocker Trust Company, of this city, will register the stock of the Lacrosse company after January 1st, 1895. We are authoritatively informed that the lessees are about to start work in the Lacrosse shaft on the Burroughs lode. This shaft, which is down 1,000 ft., is flooded to a considerable depth, and the trouble with the former lessees has been that they did not have enough capital to procure adequate pumping machinery. The boilers are already on the ground, and the work of unwatering the shaft will begin shortly.

The Board of Directors of the Horn Silver Mining Company held a meeting in this city on December 20th and decided to make a welcome New Year's present to the stockholders in the shape of a regular quarterly dividend (No. 35) of 12½c. per share, or \$51,000. The dividend is payable on December 31st. The books close at 3 p. m. on December 24th and re-open on January 2d, 1895. This brings the total amount of dividends declared by this company to \$5,030,000—truly an excellent record in these times of depression in the silver market.

**Boston.** Dec. 20.

(From our Special Correspondent.)

The market for copper stocks the past week has ruled fairly steady, but with little activity. It is rather late in the year to get up much of a boom in this class of stocks, and although the outlook for the future is promising, we do not look for any material advance until after the new year is fairly started. The market for ingot copper shows a good degree of strength, which, if continued, will add to the chances for better prices for the stocks later on. The dealings in Boston & Montana exceed those in any other stock, and the price has been fairly well sustained; although in the early part of the week it sold down to \$32½, it quickly recovered and closed quite strong at \$33. Butte & Boston shows a decline of ¼ only, selling at \$10½ with recovery to \$11. Calumet & Hecla advanced to \$290 on small sales with later sales of one share at \$289. Tamarack sold in a small way at \$150@155, ex-dividend. Quincy retained the activity and advance of last week, with sales at \$99@100, closing sale being at \$99½. There is good buying of this stock, and on any improvement in the general market it will sell higher. The scrip sold at \$38, losing ½ in later sales at \$37½. Franklin was strong, and advanced ½ to \$15½; later the advance was lost and ¼ additional, closing at \$14½. Osceola was pressed for sale this week, and the bears succeeded in forcing a decline from \$23 to \$21@21½, and probably covered some of their shorts. The directors to-day declared a dividend of \$1 per share, the first for the present year. \$2 was paid in 1893. Total dividends to date \$1,897,500. The stock closed at \$22 bid, \$22½ asked. Kearsarge was dull at 7¾, and Centennial sold at 75c. Tamarack, Jr., sold at \$11@11½, and Wolverine at \$3.

Napa Quicksilver has declared the usual dividend of 10c. per share payable January 1st, 1895.

**Salt Lake City, Utah.** Dec. 15.

(Special Report of James A. Pollock.)

The stock market this week was extremely narrow in range. The decline in silver had its effect upon timid intending purchasers, and in consequence many who would have come into the market as strong buyers stayed out. I do not know of any good reason why securities should decline, but I do not think the silver situation encouraging enough to warrant the expectation of materially higher values, except in special instances, than now exist for some time to come.

The lowering price of silver stimulated the demand for gold stocks, and this class of securities were the most prominent in the trading during the week just ended. Mercur was in strong demand, and sold for \$3.50; this is an advance of 50 cents a share in the past 30 days. Dalton was apparently regarded with more favor than for some time past, and advanced in the bidding from 2 to 2½c., and several large blocks were sold at 3c. Cane Springs is being looked into by a syndicate of Eastern capitalists, with a view to taking in a big block of stock at \$1.50 per share. Elko is still at 25c.

The bid of 75c. continues on Alliance, but no stock is coming out at the price. Anchor is quiet at \$4 asked. A block of Bogan sold at \$1. For Bullion Beck \$8 was bid. Centennial-Eureka was offered

at \$42.50, and an odd lot of shares went at that figure; the company paid its regular double dividend of \$1 per share to-day. Comstock is offered at 25c., and is not being supported by the insiders. Crescent continues inactive at 2c. bid and 4c. asked. Several thousand shares of Daly West sold at prevailing quotations. Daly is quiet at \$8 asked, and several blocks went at the asking price. There is a surplus in the treasury of about \$300,000. Horn Silver is weak, 500 shares sold at \$2.90. Mammoth is showing more strength and closed at \$1 bid and \$1.15 asked. Ontario was inactive and offered freely at \$12. Silver King is steady at \$12.50 bid and \$14 asked.

The approaching holiday season is having its effect upon the market, but I anticipate an increased activity in all lines after the first of the year.

**San Francisco.**

BY TELEGRAPH.

**SAN FRANCISCO, Cal., Dec. 21st.**—The past week has been very quiet in the mining stock market here. So many assessments are on that very little speculation is indulged in by the public. There are a number of rumors afloat, but none sufficiently definite to justify publication. Opening prices to-day were as follows: Best & Belcher, 87c.; Bodie, 67c.; Bulwer, 4c.; Chollar, 41c.; Consolidated California & Virginia, \$3.40; Eureka Consolidated, 25c.; Gould & Curry, 38c.; Hale & Norcross, 65c.; Mexican, 53c.; Mono, 21c.; Ophir, \$1.40; Savage, 27c.; Sierra Nevada, 52c.; Union Consolidated, 30c.; Yellow Jacket, 35c.

**Paris.** Dec. 10.

(From our Special Correspondent.)

During the past week speculation has continued to be strongest in the Transvaal gold stocks. The exact extent of this it is difficult to determine, since much of it is done through London, but it has been enough to draw attention away from the other stocks, which have been very much neglected. The only other tendency which I can note especially is toward some of the Russian stocks, and this has been shown in a rather curious way. Huta-Baukowa (coal) and Donetz (steel) have been very active, and have been forced up to a high point. Now, Donetz shares have not yet paid a dividend, and Huta-Baukowa, at present prices would pay less than 3%. Yet Dombrowa shares are still weak, because of an accident last summer, which has cut off one dividend only, and the consequences of which have been fully repaired. Yet Dombrowa has been a strong dividend-payer, with every prospect of continuance.

The recent attempt to work up Huanchaca silver shares has now its reaction, and the stock is dull and heavy. Nickel is better than for some time past, and has been in more favor on the anticipation of its increasing use in steelmaking.

The promised improvement in the price of copper has not come. There are no signs of any agreement among the producers, and there are reports of increased production from Mexico. Under these circumstances the copper stocks are weak. Rio Tintos—which the clique is no longer supporting—have fallen; Tharsis, Cape Copper and Jerez-Lanteira have followed suit.

**DIVIDENDS.**

Horn Silver Mining Company, dividend No. 35, of 12½c. per share, \$50,000, payable December 31st at the office of the company, 56 Broadway, New York City. Transfer books close December 24th and re-open January 2d.

Napa Consolidated Quicksilver Mining Company, dividend No. 63, of ten cents per share, \$10,000, payable January 1st at the office of the company, No. 70 Kilby street, Boston, Mass.

Osceola Consolidated Mining Company, dividend of \$1 per share, \$50,000, payable at the office of the company, in Boston, Mass., January 15th, to stockholders of record on December 28th.

**MEETINGS.**

American Coal Company, at the office of the company, No. 1 Broadway, New York City, January 8th, at 12 o'clock noon.

Barker Mining and Milling Company, at the office of the company, room 617, Mining Exchange, Denver, Colo., January 12th, at 2 p. m.

Columbia Consolidated Gold Mining Company, at the office of the company, in the Boston Building, Denver, Colo., January 7th, at 10 a. m.

Newton Gold Mining and Milling Company, at the office of the company in the Mack Block, Denver, Colo., January 9th, at 11 a. m.

Newton Milling and Sampling Company, at the office of the company in the Mack Block, Denver, Colo., January 9th, at 12 o'clock noon.

Oneida Chief Mining and Milling Company, at the office of the company in the Mack Block, Denver, Colo., January 10th, at 10 a. m.

St. John Quartz Mining Company, at the office of the company, in the store of J. M. Wiley, east side of Main street, Grass Valley, Cal., January 11th, at 2 p. m.

Warren Gold Mining and Milling Company, at the office of the company in the Mack Block, Denver, Colo., January 9th, at 11 a. m.

West Wyndotte Mining Company, at the office of the company, No. 115 Broadway, New York City, January 3d, at 12 o'clock noon.

NEW YORK MINING STOCK QUOTATIONS. DIVIDEND-PAYING MINES. NON-DIVIDEND-PAYING MINES.

Table with columns for Name of Company, Par value, Dividend dates (Dec. 15, 17, 18, 19, 20, 21), Sales, and a second set of columns for Non-Dividend-Paying Mines with similar columns.

\*Ex-Dividend. †Dealt in at New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 1,110. Non-dividend, 5,400. Total, 6,510.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for Name of Company, Par value, Dividend dates (Dec. 14, 15, 17, 18, 19, 20), Sales, and a second set of columns for another group of companies.

Dividend shares sold, 2,615. Non-dividend shares sold, 881. Total shares sold, 3,495.

COAL AND COAL RAILROAD STOCKS.

Table with columns for Name of Company, Par value, Dividend dates (Dec. 15, 17, 18, 19, 20, 21), Sales.

Total shares sold, 90,480.

San Francisco, Cal.

Table with columns for Name of Company, Par value, Closing Quotations (Dec. 14, 15, 17, 18, 19, 20), Sales.

Philadelphia, Pa. Dec. 20.

Table with columns for Name and Location of Company, Par value, Actual selling price, Bid, Asked.

Pittsburg, Pa. Dec. 20.

Table with columns for Name and Location of Company, Par value, Actual selling price, Bid, Asked.

Baltimore, Md. Dec. 20.

Table with columns for Name of Company, Par value, Latest actual selling price, Bid, Asked.

London, England.

Table with columns for Name of Company, Par value, Buyer, Seller, Bid, Asked.

Denver, Colo. Dec. 17.

Table with columns for Name of Company, Par value, High, Low, Sales.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for Name of Company, Par value, Dividend dates (Dec. 15, 17, 18, 19, 20, 21), Sales.

\*Pittsburg quotations. †Bid. ‡Asked. Total shares sold, 492,499.

Total shares sold, 52,450.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares, Par, Assessments, Dividends, Date and amount of last, Total paid, Date & amount of last, Name and Location of Company, Capital Stock, Shares, Par, Assessments, Date and am't of last.

G., Gold, S., Silver, L., Lead, C., Copper, B., Borax. \* Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$12,300,000. § Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. ¶ Previous to this company's acquiring Northern Belle, that mine paid \$2,400,000 in dividends against \$425,000 in assessments.

COLORADO SPRINGS, COLO., MINING STOCK QUOTATIONS.

Table with columns: NAME OF COMPANY, Par value, Dec. 10., Dec. 11., Dec. 12., Dec. 13., Dec. 14., Dec. 15., Sales.

\*Official quotations of Colo. Mg. St'k Ass. †Stamped. \*Per 1,000 shrs. Total shrs. sold, 362,330.

ASPEN, COLO., MINING STOCK QUOTATIONS, Dec. 15, 1894.

Table with columns: NAME OF COMPANY, Location, Par value, Latest actual selling price, Bid, Asked.

MONTANA MINING STOCKS, QUOTATIONS.

(Special Report by Samuel K. Davis.) HELENA, Dec. 7, 1894.

Table with columns: STOCKS, Location, Par val., Bid., Asked, Shrs. sold, Price, Date, Co.'s office.

Salt Lake City, Utah.

Table with columns: (Special Report by James A. Pollock.) Par val., Bid., Asked, Dec. 15.

All the above companies are located in Utah.

Duluth, Minn. Dec. 3.

Table with columns: Adams Iron Co., Bid, Ask'd, Par sell'g, Latest actual.

FOREIGN QUOTATIONS.

Table with columns: Paris, France, Dec. 8., Par val., Fr's.

ASSESSMENTS.

Table with columns: COMPANY, No., Div't, in office, Day of sale, Amt. per share.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified. Acid-Acetic, chem. pure. Commercial, in bbls. and cys. Carbonic, liquefied. Chromic, chem pure. Hyarobromic, dilute. Hydrofluoric, U. S. P. Alcohol-95%, gal. Absolute. Ammoniated. Alum-Lump, cwt. Ground, cwt. Powdered. Alumina Chloride-Pure. Amalgamating solution. Ammonia-Sal. in bbl. lots. Carbamate, b. English and German. Muriate, white, in bbls. Aqua Ammonia-(in cys). Antimony-Oxymur. Regulus. Argolis-Red, powdered. Arsenic-White, powdered. Red. Yellow. White at Plymouth. Asbestos-Canadian. Italian. Ashes-Pot, 1st sort. Pearl. Asphaltum. Prime Cuban. Hard Cuban. Trinidad, refined. Egyptian and Syrian. Californian, at mine. San Francisco. Barium-Carbonate, pure. Carbamate, commercial. Chlorate, crystal. Chloride, commercial. Iodide, oz. Nitrate. Sulph., Am. prime white. Sulph., foreign, floated. Sulph., off color. Carb. lump, f. o. b. L'pool. No. 1, casks, Runcom. No. 2, bags, Runcom. Bichromate of Potash-Scotch. American. Bichromate of Soda. Borax-Refined. San Francisco. Concentrated, in casks. Refined, Liverpool. Bromine. Cadmium Nitrate. Cadmium Iodide.

Chalk. China Clay-English. Domestic. Chlorine Water. Chrome Yellow. Chrome Iron Ore. Chromalum-Pure. Commercial. Cobalt-Oxide. Copper-Sulph. English Wks. Vitriol (blue), ordinary. Nitrate. Copperas-Common. Best. Liverpool. Corundum-Powdered. Cryolite-Pow. Cyanide, Potassium-85 to 90%. No. 0. No. 1. No. 2. No. 3. Mining cyanide. No. 4. Emery-Grain. Epsom Salt. Feldspar-Ground. Crude. Fluorspar-Powdered. Lump, at mine. French Chalk. Fuller's Earth-Lump. Glauber's Salt-in bbls. Glass-Ground. Gold-Chloride, pure, crystals. pure, 15 gr. c.v. liquid, 15 gr. g. Chloride and sodium. Oxide. Gypsum-Calcined. Land Plaster. Iodine-Resublimed. Iridium-Oxide. Iron-Nitrate. Kaolin-See China Clay. Kieserite. Lead-Red, American. White, American, in oil. Acetate, or sugar of, white. Granulated. Nitrate. Lime Acetate-Am. Brown. Litharge-Powdered. English flake. Magnesite-Crude. Calcined. Brick, ton of 2,240 lbs. Manganese-Ore, per unit. Oxide, ground. Mercuric Chloride-Corrosive. Powdered. White Dust.

Metallic Paint-Brown. Red. Mica-in sheets according to size. 1st quality. Minerals Wool-Ordinary slag. Ordinary rock. Ground. Naphthalene-Black. Nitro Cake. Ochre-Rochelle. Washed Nat Oxid. Powder. Golden. Domestic. Oils, Mineral. Cylinder, light filtered. Dark filtered. Extra cold test. Dark steam refined. Phosphorus-Red. white. Platine Chloride-Dry. Plumbago-Ceylon. American. Potassium-Cyanide. mining. Bromide, domestic. Chlorate, English. Chlorate, powdered. Carbonate, lb. by casks. Caustic, lb. pure sicc. Iodide. Nitrate, refined. Bichromate. Yellow Prussiate. Red Prussiate. Pumice Stone-Select lumps. Original cks. Powdered, pure. Pyrites-Non-pureous. Quartz-Ground. Rotten Stone, Powdered. Lump. Original cks. Sal Ammoniac-lump, in bbls. Salt-Liverpool, ground. Domestic, fine. Common, fine. Turk's Island. Salt Cake. Saltpeter-Crude. Soapstone-Ground. Block and slab according to size. Sodium-Prussiate. Phosphate. Stannate. Tungstate. Hyposulphite, cwt. in casks. Strontium-Nitrate. Sulphur-Roll. Flour. Sylvinit. Talc-Ground French. American No. 1.

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**WANTED.—A METALLURGICAL CHEM-** ist of 13 years' experience desires a position as superintendent or assistant with copper or lead and silver reduction works. Best of references furnished. Address H. S., ENGINEERING AND MINING JOURNAL. No. 17,017, Dec. 29.

**A GRADUATE OF THE COLUMBIA COL-** lege School of Mines would like position as assistant to superintendent in charge of mines or reduction works. Address MINING, ENGINEERING AND MINING JOURNAL. No. 17,033, Dec. 29.

**MINING ENGINEER AND SUPERINTEN-** dent, 20 years' experience in gold, silver, copper and coal, is open to engagement. Address INTEGRITY, ENGINEERING AND MINING JOURNAL. No. 17,026 st.

**A SMELTING SUPERINTENDENT, LEAD** and copper; 10 years' experience; open to engagement January 1st. Address METAL, ENGINEERING AND MINING JOURNAL. No. 17,041, Feb. 2.

**A YOUNG MAN DESIRES A POSITION AS** assistant mining engineer; can assay, analyze and survey, besides making himself generally useful about mine, etc.; understands Spanish. Address ESPANOL, ENGINEERING AND MINING JOURNAL. No. 17044, Dec. 29.

**ASSAYER—YOUNG MAN, TWO YEARS'** experience, desires position. Best references. Address RELIABLE, ENGINEERING AND MINING JOURNAL. No. 17,053, Dec. 29.

**A PRACTICAL MINING ENGINEER AND** manager of coal and coke works, who can furnish first-class references from past and present employers, will be open for an engagement on January 15th, 1895. Ten years superintendent of large and fiery mines in the bituminous region of Pennsylvania, and over 30 years' experience in coal mines. Fair geologist, and is thoroughly acquainted with all the inside details of economical coal mining. Is a good manager of workmen. Address COAL AND COKE MANAGER, ENGINEERING AND MINING JOURNAL. No. 17,054, Jan. 5.

**WANTED—POSITION AS ASSAYER,** amalgamator, surveyor, chemist or assistant mining engineer by a steady young man who has a thorough knowledge of bookkeeping. Open to engagement January 1st, 1895. Best of references. Address WILLING, ENGINEERING AND MINING JOURNAL. No. 17058, Dec. 29.

**A TECHNICAL GRADUATE, EXPERT IN** the MacArthur-Forrest Process, chemist and assayer, is open to engagement. Address CYANDIE PROCESS, ENGINEERING AND MINING JOURNAL. No. 17,055, Jan. 12.

**MECHANICAL ENGINEER AND CON-** centrator man desires position. Can design concentrators for working base or refractory ores. Understands electricity and is expert pumpman. Will go anywhere. First-class recommendations. Address D J., ENGINEERING AND MINING JOURNAL. No. 17059, Dec. 29.

**YOUNG GENTLEMAN, AT PRESENT EM-** ployed as private secretary to president of one of the largest mining companies of the United States, would like to change to a position in Mexico, Central or South America. Address H. W., ENGINEERING AND MINING JOURNAL. No. 17,061, Dec. 29.

**POSITION AS MANAGER, SUPERINTEN-** dent or traveling representative desired by a mechanical engineer, experienced in cost and design of engines, hoisting and rope haulage plants. Address G., ENGINEERING AND MINING JOURNAL. No. 17,061, Jan. 5.

**A THOROUGH AND PRACTICAL MAN RE-** quires a position to amalgamate or assay for mine or mill. Address MILLMAN, care B. Nash, Box 287, Berkeley, Cal. No. 17,064, Jan. 26.

**WANTED—A SITUATION IN SOME GOOD** shop as draughtsman or machinist; graduate of the N. C. College of A. & M. Arts of class '93; 24 years of age; have been engaged in the phosphate business in South Florida for the last year; good references. Address Postoffice Box 171, Laurinburg, N. C. No. 17,065, Dec. 29.

**Contracts Open.**

**BRIDGE.—Natchez, Miss.**—Proposals are wanted until February 4th, 1895, for the construction of a steel bridge, with approaches thereto, over the Homochitto River, at Swayze's Ferry, Miss. ALLISON H. FOSTER, Chancery Clerk, Adams County, Natchez.

**BRIDGE.—Buffalo, N. Y.**—Plans are invited for a bridge across the Erie canal on the line of Porter avenue, Buffalo, N. Y., in accordance with general specifications on file in the office of the park commissioners, Room 5 City and County Hall, to be submitted on or before noon, Jan. 8, 1895. WM. McMILLAN, Superintendent.

**PROPOSALS FOR NEW BRIDGE.—State of** Michigan, County of Houghton.—Proposals for the rebuilding of the county bridge across Portage Lake (excepting the draw) will be received at the office of the County Clerk at Houghton, Mich. Proposals invited for iron or wood, and should be made on or before January 8th, 1895. By order of the Board of Supervisors. ROBERT H. SHIELDS, Clerk.

Houghton, Mich., December 11th, 1894. Orig.

**STONE DAM.—Sealed proposals will be received** by the Holyoke Water-Power Company, at their office in Holyoke, Mass., until February 15th, 1895, for the construction of a stone dam, with abutments and wing walls, on the Connecticut River, in the city of Holyoke and village of South Hadley Falls. Summary of work: 34,500 cu. yds. rubble stone masonry; 1,825 cu. yds. granite dimension masonry in upper courses of dam; 7,000 cu. yds. granite dimension masonry in face of dam; 2,500 cu. yds. split granite masonry in back of dam; 2,300 cu. yds. granite dimension masonry in abutments and wing walls. Forms of proposals, specifications and plans may be obtained at the office of the company. A certified check for \$10,000, made payable to the Holyoke Water-Power Company, must accompany each bid. The company reserves the right to reject any or all bids. HOLYOKE WATER-POWER COMPANY, by EDWARD S. WATERS, Treas.

**U. S. ENGINEER OFFICE, 121 FRANKLIN** Street, Buffalo, N. Y.—Sealed proposals for hire of dredging plant on improvement of Tonawanda Harbor and Niagara River, New York, will be received here until December 31st, 1894, and then publicly opened. Information furnished on application to Major E. H. RUFFNER, Engineers.

**U. S. ENGINEER OFFICE, WILMINGTON,** N. C.—Sealed proposals will be received here until January 7th, 1895, for furnishing and delivering at Fort Caswell, N. C., cement, broken stone, rubble stone and sand for concrete masonry. All information furnished on application. W. S. STANTON, Major Engineers.

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The Regular Quarterly Dividend of Twelve and One-Half Cents a share has been declared upon the stock of this company, payable on and after December 31st, 1894, to stockholders of record at the close of business December 24th.  
The transfer books will close at 3 o'clock P. M., December 24th, and reopen at 10 o'clock, January 2d, 1895.  
A. I. HARRISON, Secretary.

**Notice of Assessment.**

(Civil Code of California.)

Bulwer Consolidated Mining Company. Location of principal place of business, San Francisco, California. Location of works, Bodie, Mono County, California.  
Notice is hereby given that at a meeting of the Board of Directors, held on the 11th day of December, 1894, an assessment, No. 10, of Five (5) Cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 33, Nevada Block, No. 309 Montgomery Street, San Francisco, California, or to the Farmers' Loan and Trust Company, Nos. 20 and 22 William Street, New York.  
Any stock upon which this assessment shall remain unpaid on the 16th day of January, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on Friday, the 15th day of February, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.  
By order of the Board of Directors,  
J. E. JACOBUS, Secretary.

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**WANTED.—A RAILROAD SUPERINTENDENT** wanted. In addition to the possession of business ability, he must be in a position to aid the enterprise by placing some of its bonds. Apply to **HUGO A. STURONG, Vice-President Amador Railroad Company, No. 1 Broadway, New York City.**

**Contracts Open.**

Continued from page 18.

**TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., December 27th, 1894.**—Sealed proposals will be received at this office until 2 o'clock p. m. on the 24th day of January, 1895, and opened immediately thereafter, for all the labor and materials required for joinery work, wood flooring, marble work, vault doors, etc. for the United States Custom House and Post-Office at Newark, N. J., in accordance with the specification and drawings, copies of which may be had at this office, or at the office of the Superintendent at Newark, N. J. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any and all bids and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All bids received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked "Proposal for Joinery Work, Wood Flooring, Marble Work, Vault Doors, Etc., for the United States Custom House and Post-Office at Newark, N. J.," and addressed to **CHARLES E. KEMPER, Acting Supervising Architect.** Orig.

**WATER-WORKS.—Corry, Pa.**—This city will receive bids up to February 1st, 1895, for the construction of water-works, also supplying the city with water for fire service. For further information address **Col. T. A. EDWARDS.**

**WATER-WORKS.—Decatur, Mich.**—Bids will be received up to January 10th for constructing water-works system. Address **F. C. STAPLETON, Clerk.**

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