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CONTENTS.

Table listing contents with page numbers. Includes sections like Electric Furnaces, The Brunswick Lode Explorations, The Mechanical Engineers and the Metric System, etc.

Researches in electric-furnace work have already proved that all refractory substances such as lime and magnesia and the least fusible metals may be melted and volatilized by its means, and that only certain compounds of carbon, silicon and boron— which can themselves be formed only at the extraordinary temperatures of the electric furnace—are capable of holding their forms under its intense heat.

The exploration of the Brunswick Lode in Nevada, which was heralded a year or so ago as promising to restore the falling fortunes of a number of the old Comstock mining companies, does not seem to be resulting very favorably. The weekly reports issued by the companies have been uniform in their tenor and have shown little or nothing.

It is to be regretted that a body of men, usually so progressive and anxious for improvement as the American Society of Mechanical Engineers should permit their organization to be committed as it has been to a line of policy which involves opposition to improvement and progress in the important matter of weights and measures.

The recent rapid increase in the price of sulphur through the operations of the Sicilian combination, and the probability that prices can be kept up to or at least near the present level, has turned attention very generally to the possibilities of an extended use of pyrites in the manufacture of sulphuric acid, or to obtaining new supplies of sulphur.

The present conditions certainly present a favorable opportunity for the development of our own deposits of sulphur, which has heretofore proceeded very slowly. It seems probable that if the Sicilian operators hold together and succeed in keeping up the price, an increase in domestic supplies, both of sulphur and pyrites, may be expected.

South Africa has for several years past occupied so much of the attention of the world that comparatively little attention has been paid to the possibilities of the development of new gold-fields in other quarters of the world.

the stock markets for a time, that its somewhat slow development and the smallness of the actual results thus far obtained have put it out of the race. We must look elsewhere for the next new gold-field to be developed and there is some uncertainty as to where it will be. It is believed that there are valuable gold deposits in Borneo and others of the great islands of the Indian Ocean, but the interior districts of all those islands are but little known and the conditions are generally very unfavorable to their exploration, as they are occupied by native races who are extremely jealous of European encroachments, and are at the same time warlike, treacherous and much more tenacious and difficult to control than the African races, who are generally quite satisfied to live under and work for the white man when they are once subdued. The Malays and the Deaks of Borneo and Sumatra are never really conquered and are always ready to kill their would-be masters. In spite of these obstacles we are informed that an English company is making preparations to work on a very large scale in the Island of Borneo, where explorations have shown the existence of an extensive deposit of low-grade gold ores. There are great possibilities for the future in South America, and some people are convinced that the upper valley of the Amazon and its tributaries are the gold regions of the future; while the possibilities of the Guianas have recently been referred to in our columns.

These considerations refer only to new gold-fields. We are seeing now a remarkable development in our older producing countries. The increase in the United States continues, and the older Australian fields are also gaining. The Russian production will probably show a great gain in the next few years, and there is little doubt that gold production will continue at a high level for some years to come.

The Metallurgical Museum of Columbia University.

The trustees of Columbia University, in New York, have assigned to the Metallurgical Museum in the new buildings a floor-space of 4,000 square feet in a room 25 feet high. The collections constituting this museum are already large and valuable; but they have been for a long time comparatively useless to the public and to students, because the lack of room has made it necessary to keep them packed or out of sight. The opportunity is now presented to make this museum the finest in the world, and to render its usefulness commensurate with its excellence. The numerous graduates of the Columbia School of Mines may be relied upon, of course, for a hearty co-operation; and, occupying as they do many positions of trust and power in American metallurgical works, they can unquestionably effect an extensive, if not an absolutely complete, representation of that art in this country. But it is not they alone who should be interested in the matter, or to whom its execution should be confined. All metallurgists should be glad to assist in it by contributing, or inducing others to contribute, suites representing processes and products, parts of furnaces, tools and other devices employed in metallurgical work, etc. As illustrations, rather than as a complete list, the following things may be named: Samples of water-backs (steel, wrought-iron, cast-iron, bronze, etc.), tuyeres of any kind, furnace tools, molds, ingots, etc. Any person interested in this subject will doubtless receive grateful acknowledgment and prompt advice upon communicating with Prof. Thomas Eggleston, the Professor of Metallurgy at Columbia University, who is earnestly engaged in plans for perfecting the museum. R. W. R.

Unprotected Lights in Coal Mines.

Almost every issue of the daily papers contains an account of an accident in the anthracite coal mines due to an ignition of gas by the workmen, resulting quite often in loss of life and more or less serious damage to the mine. The frequency of these occurrences of late calls especial attention to the need of a remedy that will prevent them. Their cause is evident enough, namely, the general use of open lights underground. The mine officials and the workmen are not unmindful of the danger which the use of naked lights entails, but the former yield to the unanimous desire of the underground employees to permit their use in place of the less dangerous safety lamps. The reason for this apparent courting of danger is the extremely dim light given out by the safety lamp in use in the anthracite mines—the Davy—which is about one-sixth of one candle-power. This faint illumination is in itself a cause of accident, preventing, as it does, the detection of danger. In addition—and this objection is shared by employer and employee alike—the light of the safety lamp is not sufficient to allow the men to perform their work with the same facility as when they are working by the brighter light of an unprotected head-lamp.

The problem that awaits solution is the construction of a lamp that will give a good light and be safe in the hands of the workmen. The construction of a lamp burning oil or spirits that will meet present requirements has been attempted for a number of years, but so far only with partial success. The remarkable progress which electricity has made in its useful applications within recent years leads us to hope that an electric

lamp will ere long be produced that will solve the problem. In all probability such a lamp will not be a gas detector, but we believe that is not an essential feature of a workman's lamp. Electric safety lamps have already been made, but the great weight (about six pounds) of the storage battery has so far resulted in their being regarded as little more than novelties.

Until such time as a safe lamp of good illuminating power is devised, more strenuous measures should be adopted to prevent ignition of the gas where the use of open lights is permitted. We believe the danger from this cause can be very much lessened by the employment of additional fire-bosses, whose duty it shall be to make the rounds of the mines while the men are at work, and make the usual tests for gas. At present the usual practice is for the fire-bosses to make their rounds a few hours before the men enter the mines for their day's work, which is not sufficient to insure their safety from gas throughout the day.

As an additional precaution every door which, when left open by mistake, permits gas to collect in places where it is effectually removed when the door is closed, should be guarded by a boy to keep the door in its proper position. The present law requiring the employment of door-boys and the hanging of doors so that they will close automatically does not seem to be sufficient to cover the requirements.

The use of a few precautions of this kind would, we believe, materially reduce the number of accidents resulting from explosions of gas, and it is most desirable that some such rules should be adopted.

Engineers and the Public.

We presume that no one will question the assertion that the first requisite of success at the present day is to be known. Publicity and general reputation among men are absolutely essential in professional as well as in business life to the man who would take and hold a good position in any direction. Knowledge, experience, energy, industry, are required, of course; but all these are of little avail to the man who is not known or recognized by the public. And the stress of our modern business life is so great, the competition so sharp, that the man who neglects this requisite of publicity speedily falls behind in the race, no matter how great may be his other qualifications for his work.

This applies, with especial force to the mining engineer or metallurgist whose work may be anywhere, who goes all over the world in the pursuit of his profession, who is here to-day and may be next year in a different country, and whose work is seen by few persons. No matter how well he may have done here, he may be speedily forgotten, when he has gone to South Africa or Australia, and he may return to find himself displaced by new competitors and obliged to begin again almost at the bottom unless he has in the mean time taken care to keep himself before the public in a proper way.

A few weeks ago we had a striking instance of this in another branch of the engineering world. A man died in Detroit who was, not many years ago, the head of two of the best-known, best-managed and most successful railroads in the country. If any railroad man had been asked to name the five most prominent railroad managers in the country, he would certainly have included James F. Joy in the list. He retired full of honors and with a high reputation; and yet when Mr. Joy died recently, the first remark of nine out of ten men who read his obituary was, "Why, I thought he was dead long ago." He had simply dropped out of public notice and had been forgotten. In his case, of course, it made little personal difference, since his active career was closed; but to a man who has still years of life and work before him, to be forgotten in his absence may be a most important matter.

Now, there are various ways in which an engineer can keep himself in the public remembrance. We do not, of course, speak here of the seeker after mere notoriety, but of the engineer of good repute, who knows that he can do good work and only wants to have his special public kept aware of the fact that he is ready and willing to do it. He is willing to use only reputable means of doing this and is sometimes uncertain how to accomplish his object. Such a man should know that there is no better or surer way of securing the publicity he wants than to use the columns of the best technical papers in his professional calling. If he is a railroad, a mechanical or a mining engineer, he should keep his name before the readers of the best papers (and only the best, for a man is judged by the company he keeps), devoted to his branch of the profession.

To accomplish this he should write the results of his professional experience, telling what he knows about his specialty; nearly every engineer has now a specialty, and the day of the "Jack of all trades" has passed forever. Some engineers look upon what they know as a trade secret and think that if they told it out loud they would be giving away all their stock in trade, but we have no hesitation in asserting—as a result of a quarter of a century's experience in editing the *Engineering and Mining Journal* and in following the professional careers of engineers—that the knowledge which pays an engineer best is the knowledge he gives away by writing it down for publication; and no part of his time

is spent with greater advantage to himself than that he devotes to writing for his professional periodicals.

It is not, however, enough that the engineer write, for his contributions are necessarily comparatively few, and his name and address will slip the mind of even the most careful reader. It is not less important that he keep his name, professional specialty and address constantly before all who may need such services as he has to give, and this can be done only by steadily advertising in the same professional directories of the papers.

No one imagines that publishing a professional card is going to make an engineer famous, or fill his time with profitable employment, but assuming that the advertiser is a competent engineer, the keeping of his name and address constantly before those who may need his services does undoubtedly bring him many engagements, and even from those who know him, but had otherwise overlooked him in the rush of business that crowds nearly every one commanding capital or engaged in important work. The records of the *Engineering and Mining Journal* and of *The Mineral Industry* contain abundant evidence of the value of this advice in the letters of many distinguished engineers acknowledging that they had obtained valuable engagements or made useful connections through the cards they publish in these periodicals.

The engineers who become known and succeed in having their services sought after are certainly those who advertise themselves by both making public the fact that they know their business, and by keeping their names constantly before those who need their services.

NEW PUBLICATIONS.

WIRE ROPE TRANSPORTATION IN ALL ITS BRANCHES. Trenton, N. J.; The Trenton Iron Company, and New York; Cooper, Hewitt & Company. Pages, 172. Illustrated.

This book, which is nominally and in form a catalogue of the Trenton Iron Company, more nearly approaches a work on the use of wire rope, since it contains much information of a valuable kind on wire-rope tramways, haulage plants and power transmissions that will be of value to the engineer and manufacturer. Being a catalogue, it devotes special attention to the work done by the company, but that has not excluded valuable data and instructions. The descriptions include three forms of rope tramways, the Bleichert, the Roe and the Acme; hoist-conveyors for quarries and other open work; haulage plants for inclined planes and other surface work and for underground work; and finally rope transmissions of power. The extending applications of the aerial tramway are well known, and it is not going too far to say that there are instances where they have made operations possible which would otherwise have been too costly for practice. The plants mentioned in this catalogue are well worth study.

THE TAYLOR GAS PRODUCER: GAS FUEL AND THE APPLICATION OF PRODUCER GAS TO MANUFACTURING PURPOSES. Philadelphia; R. D. Wood & Company. Pages 64; illustrated.

This book, like others we have mentioned, is too useful and convenient a hand-book to be classed with the ordinary trade catalogue. It is especially useful at the present time when the question of gas fuel is being very generally considered, and the use of producer gas is extending as fuel-users and engineers realize its advantages. The Taylor producer is a device the excellence of which has been well established by practical use, but there is much given here about its management and the work done that is new. Besides the descriptions and illustrations of plants which are given, a considerable part of the book is given up to a general consideration of fuel-energy and its utilization, in which the uses of the different forms—solid, liquid and gaseous—are carefully considered, and their respective advantages and disadvantages stated. To these it is not necessary to refer here.

The book is one which will be very convenient to fuel-users, who ought to read it carefully. The special references to the Taylor producer are modestly subordinated to the general information given; and that producer has established its claim to the commendations given it by the makers, who publish this catalogue.

A TEXT-BOOK OF PLANE SURVEYING. By Prof. William G. Raymond. New York, Cincinnati and Chicago; the American Book Company. Pages 488; illustrated. Price, \$3.

This work has been prepared as a manual both for the study and practice of surveying. The long experience of the author as a teacher and as a practicing engineer is evident in the contents and plan of the book. Points likely to present difficulty to the student or to the young surveyor are most carefully elucidated. The methods are modern, the statements generally clear and concise, the directions definite. The book includes topographical, hydrographical and mine surveying, land survey and earth-work computations, field work and map-making and the slide rule, a useful tool of the engineer. A large number of original problems and examples is given, furnishing plenty of material for practice to the student.

The tables have been carefully revised, are accurate, and embody recent improvements which especially adapt them to the use of the surveyor and the student. They are printed on tinted paper, to distinguish them from the remainder of the book, thus facilitating ready reference. The idea is a good one, though the pink tint used seems to us hardly the best for the purpose, or the eyes. Large, clear, differentiated type is used, and the paging is so arranged that logarithms of all numbers beginning with a given figure may be found without turning over the page. Five-place tables are adopted, and the arrangement is for tenths of a minute instead of for seconds.

The illustrations are numerous, and include cuts of the principal instruments used in surveying. The examples of map drawing are well

executed, and the colored maps, finished as in actual practice, are a feature seldom found. Some examples of mine maps are included.

ROENTGEN RAYS AND PHENOMENA OF THE ANODE AND CATHODE. By Edward P. Thompson and William A. Anthony. New York; the D. Van Nostrand Company. Pages, 190; illustrated. Price, \$1.50.

This book is a serviceable compilation of the data so far published and accessible concerning the new form of energy variously known as the X-ray or the Roentgen ray. It includes a discussion of the nature of the X-rays and of the facts and principles involved, and also refers to the practical applications so far made and to those which seem possible or probable hereafter. Facts and references have been collected from all possible sources. Efforts have also been made to trace out the different indications and earlier experiments which led up to Professor Roentgen's discovery; and to give all credit due to different investigators. The subject is still so new as to make the authors' task a very difficult one, and to require a great deal of care on their part.

As to the applications of the discovery especial attention is paid in the book to those which may be of service in surgery. In this connection a good deal of attention is given to the new department of photography established by the discovery, and many suggestions are made as to the plates to be used, time of exposure and other details of practical work.

The work has apparently been compiled with care. While it is too early yet for the full treatise on the subject, the present book will be of great service to those who desire to study the X-rays scientifically alone, or in the practical spirit, which is much more common nowadays.

NOTES ON QUALITATIVE ANALYSIS, ARRANGED FOR THE STUDENTS OF THE RENSSELAER POLYTECHNIC INSTITUTE. By W. P. Mason. Third edition. Easton, Pa., Chemical Publishing Company. Pages 56. Price, 80 cents.

This is a simple and effective scheme for elementary practice in laboratory work. As Professor Mason says in his preface, there is small doubt that, were it not for the expense of printing, every teacher of chemistry would use a text-book made by himself "with either pen or scissors," for the sufficient reason that it is more acceptable to both the instructor and the student to use a book from cover to cover, rather than to cut and omit material more voluminous than the class requires.

Probably nothing will ever take the place of Fresenius's standard work; yet it is too heavy and too detailed for engineering students who only need a grounding in determinative chemistry. Looking over Professor Mason's scheme cursorily one is impressed with the simplicity of the tests, which include not only the chemical reactions, but flame coloration, spectroscopic examination and the physical characters of substances to be tested, and yet are easy and plain enough for the beginner. The only difficulty with such a scheme is that, while it teaches laboratory students to determine the "unknown" substances given out by the instructor, and, we suppose, almost invariably consisting of one base and one acid, it does not help much in the qualitative analysis of the things one meets in actual practice, where the bases or the acids or both are complex, and the distinctive reactions for a small percentage of either affect the general result. The essential point in practical work is the separation of the groups, and determinations, one by one, of each of the elements. This is something that the first two years of the ordinary technical curriculum barely suffices to accomplish.

Still, for a simple, compact scheme, suitable to engineering students who do not intend becoming professional analysts, and as an introduction to the more complete qualitative and quantitative systems, Professor Mason's modest scheme and instructions are very welcome, and will be very useful in their proper sphere.

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.

Los Fermentos de la Tierra. Por P. P. Deherain. City of Mexico; Government Printer. 1895. Pages, 93.

Annual Report of the Chief of Engineers, United States Army, 1896. Washington, D. C.; Government Printing Office. Pages, 471.

Boletín de Agricultura, Minería e Industrias de la República Mexicana. Año VI.—Número 1, July, 1896. City of Mexico; Government Printer. Pages, 199.

Hendricks' Architects' and Builders' Guide and Contractors' Directory of America. For the year 1896-97. New York; Samuel E. Hendricks Co. Pages, 887. Price, \$5.

Etudes d'Ethnographie Préhistorique. Les Plantes Cultivées de la Période de Transition au Mas d'Azil. By Ed. Piette. Paris, France; Masson et Cie. Pamphlet, pages, 24; illustrated.

Western Australia: Report of the Department of Mines for the Year 1895. With Supplementary Notes on Part of 1896. Perth, W. A.; Government Printer. Pages, 77; with maps and diagrams.

Kalender für Elektrochemiker sowie Technische und Physiker für das Jahr, 1897. Mit einer Beilage. Von Dr. A. Neuburger, Redakteur der *Elektrochemischen Zeitschrift*. Berlin, W., Germany; M. Krayn. Pages, 682 and 320, respectively; illustrated.

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.

Some Questions for Assayers.

Sir: What, in your opinion, or that of some experienced reader, is the best form of brick assay furnace for a public assayer who averages 20 assays daily, the greater part of the work necessitating half-ton crucible charges?

If we adopt the muffle furnace, which chimney draft is preferable—one

over the center, over the rear or over the front of muffle? For crucible work where should the fume-hole in the muffle be situated?

With chimney over center of muffle should the front of muffle be flush, or nearly so, with side of furnace? If not, how far should muffle be set back and how large should front opening be for best results in cupellation? With back or center draft is it a good plan to have the firebox extend beyond the front of the muffle?

What device is best for holding the muffle in place? What material is best for a damper in chimney? Where one muffle is placed over another is there any gain in heat in hanging the upper muffle the narrowest?

What sized opening is best for mouth of chimney when using 9×15 muffle and how much space should be left back of muffle? How far should a 9×15 muffle be above the grate bars with soft coal for fuel?

DENVER, COLO., Nov. 29, 1896.

A. C.

The Use of Sheet Zinc for Roofing.

Sir: I have read with a great deal of interest the article on the "Application of Sheet Zinc for Roofing" in your *Journal*, and I confess that it has called my attention for the first time to the good qualities of the metal, though I ought to have known something about it long ago. I am familiar with and have used all the styles of roof common in America—tin, slate, shingles and, though always under protest, that cheap abomination, the tar and gravel roof. I know pretty well the defects of each and the cost of keeping each in repair and I think that in his comparisons Professor Seamon has certainly stated the case very fairly, making no overstatements of their cost of maintenance and no understatements of durability. He has made out a case which ought to secure zinc a fair trial.

The putting of a cheap tin roof on a costly building has often seemed to me an anomaly, though it is continually done in New York. There are two or three copper roofs in the city which have done good service. The best known of these is on Trinity Church, and has been there some 50 years now, with very little repair. The roof of the Sub-treasury building on Wall street is also, I believe, of copper. The cost of that metal, however, has always been too high for general use in this way.

Not long ago I recommended the use of copper for the roof of a large and costly building, but the proposal was negated after some discussion, and a tin roof put on; but the owner has since told me that he regretted his decision. Had I then read Professor Seamon's article, I think that zinc would have been used. At the present prices it would not be a costly roof.

This is one of the cases where we all follow in a beaten track and use a certain material simply because everyone else does, and no one has the enterprise to make a change. We are great builders in America, but the building trades are possessed by a spirit of conservatism, which is apparent in this and many smaller matters.

We owe thanks to your *Journal* and to Professor Seamon for calling attention to this matter, and for giving us some practical information to go upon. Your zinc people ought to push it, for it may mean a good deal to them.

NEW YORK, Nov. 18, 1896.

BUILDER.

The State Line District, Utah.

Sir: The State Line District is one which is attracting considerable attention, but the notices of it in the local papers contain the usual amount of exaggeration. The district is situated in Iron County, in Southeastern Utah, and, as the name implies, is right on the line between Utah and Nevada, a portion of the belt being in each State. That portion in Utah is called the State Line District, that in Nevada the Eagle Valley District. The only settlement is known as Line City and is in Utah about $2\frac{1}{2}$ miles from the State line. This city at present consists of 15 or 20 houses and a few tents. In the district there are probably 200 men who are all busily prospecting and making locations. The first location made in the district is called the Utah Spur, and was located on June 3d, 1895. Very few others were made between that date and January 1st, 1896, but since that time 370 have been made in the State Line District, and a large number in Nevada in the Eagle Valley District.

The mineral belt extends for a distance of 10 miles northeast from Line City and seven miles southeast from the same point, and is about three miles wide. Between these limits most of the ground has been located, and a few of the claims have been worked enough to show the vein on the surface. The most northerly location which shows any mineral is the claim of Jesse Jones, which is a vein of quartz said to be about 8 in. wide, nearly all showing free gold. From his claim south to within about a mile from town the country is all located and staked, but very few of the claims as yet show any mineral. As most of the prospecting so far has been done on horseback this is not surprising, and it is probable that good values will be found in a number of the locations.

Under the district rules "5 ft. of work" is sufficient to hold a claim, and as the rule is so indefinite most of the locators have complied with the rule by digging a trench 5 ft. long and 1 ft. deep, expecting this work to hold their claims till January 1st, 1898.

About seven miles southwest of the town in the Eagle Valley District, a large number of locations have also been made, quite a number of which are said to show very wide croppings of gold quartz, which pans and assays well. Mr. Troutman, who has a number of claims in this district, shows assay certificates of 23 samples taken 100 ft. apart from the surface of a ledge 20 ft. wide, which show an average value of \$16 in gold and 20 oz. silver. Mr. Allen G. Campbell, of Salt Lake, is interested in a number of locations in the same district.

A few of the claims situated near the town have been developed enough to enable one to form some impression as to their probable value. Here there are two systems of veins, in one of which the principal vein is silver and in the other gold. The country rock is porphyry of various kinds; the vein matter is quartz.

The Ophir claim, which is the most developed, has a shaft down 160 ft. on an incline of about 75° to 80° . The shaft has followed the hanging wall all the way down; this is a well-defined wall of porphyry; the foot-wall has not been cut in the shaft, so it is not definitely known how wide the vein is. At the time of my visit the quartz in the bottom was fully 5 ft.

in width, and only one wall exposed. This mine is said to have more than paid all the expense of sinking and of its equipment, which is a whim. The last shipment of ore to Salt Lake ran 600 oz. silver and \$30 in gold. To get such values requires careful sorting, but the value of the ore as extracted and that on the dump is said to be 50 oz. silver and \$5 to \$8 in gold. The strike of this vein is nearly east and west, dip to the north. It is owned by Sullivan, Clark & Lynch, who also own 14 other claims in the same locality and adjoining it, making a large group. In the other claims of the group but very little work has been done, but in some of them the vein has been exposed.

About one-half mile from the Ophir is the Burro claim, which belongs to Stinson & Peak, and has a shaft down on the vein about 50 ft. This vein is somewhat smaller than the Ophir, but shows considerable value, the last shipment netting the owners \$125 per ton. The strike is about N. 15° E. Near the town are a number of locations which show good gold values. A short distance west of the town Drake & Lambert have a group of claims which have been developed by short adits. In these claims there are several parallel veins running nearly north and south. The veins are from a few inches to several feet in width, and all show value in the pan. The assays from these veins run from \$5 to \$30 in gold, and only a few ounces in silver. The gold appears to be all free and should be saved on plates with little difficulty.

Across the gulch from this group are a number of claims owned by Rice Brothers, which are extensions of the former group. These are also developed by an adit, which shows ore of similar character and value to that of Drake & Lambert. Close to these groups are other claims which have shallow shafts exposing the veins.

In the district there is an abundance of fuel, and it is thought that a good supply of water for milling purposes can be had by sinking wells in the gulches. Quite a number of shallow wells have already been sunk by prospectors, and all of them have found water at a depth of less than 10 ft. from the surface.

Judging from the small amount of work that has been done, I think it is a very promising district and one which needs only intelligent development to become prominent. At present all the claims are owned by men, most of whom have had little or no experience in prospecting or mining, and before much can be accomplished outside capital must be secured. The owners hold their locations at prohibitory figures just now, but before long I think they will be willing to make more favorable terms.

Without mills most of the locations are valueless, there being at present only two which have ore high enough in value to stand the expense of freight and treatment.

The camp is 80 miles from the town of Milford, on the Union Pacific Railroad, but is only 16 miles from the old grade which extends to Pioche, Nev. In case the district improves, as it promises to do, it will not cost a great deal to build a railroad to it.

W. F.

MAMMOTH, Utah, Oct. 31, 1896.

Mining Regulations in Sicily.—The Italian government has introduced in Parliament a bill regulating work in mines, with special reference to the Sicilian sulphur mines.

Glucinum.—At a recent meeting of the Academie des Sciences of Paris, M. André Duboin referred to a former note which he had presented on a method of producing double silicates of potassium and another base, and stated that he had recently applied this method to glucinum with a view of comparing that metal with aluminum and magnesium. The results of his experiments proved that it was possible to prepare the new body in considerable quantities, and that it presented much interest with respect to the comparison and classification of its oxides. M. Duboin added that glucinum showed more points of affinity with magnesium than with aluminum, chiefly because of the solubility of glucinum in fluoride of potassium, and of the formation of double fluorides.

Properties of Uranium.—According to M. Henri Moissan, in a recent issue of *Comptes Rendus*, pure uranium is of a whiter color than iron. It can be filed with ease and does not scratch glass. It is made yellow by the presence of nitrogen. It is not magnetic, and is much more volatile in the electric furnace than iron. In a state of powder it burns in fluorine, forming a green fluoride. It is attacked by chlorine at 180° C., by bromine at 210° C. and by iodine at 260° C. It burns in oxygen at a temperature of 170° C., and combines with sulphur vapor at about 500° C. It combines easily with nitrogen at $1,000^\circ$ C. and decomposes ammonia at a red heat, and, if very finely divided, decomposes water slowly at ordinary temperatures.

Electric Power for Mines in Westralia.—A project is on foot for the supply of electric power to the Westralian gold-fields. Lord Kelvin and Mr. Brown, of the Brown-Boveri Company of Switzerland, are said to have given their attention to and approved the scheme in question, which has been brought under the notice of the general public and the government of Western Australia by Scottish Westralia, Limited, who, last year, obtained permission to utilize the Perth-Coolgardie railway track for the erection of poles to convey electric power to the fields. In order to prove their good faith, says *Westralia*, and as an earnest that the undertaking would be carried to completion, the company at that time deposited with the Colonial Treasurer a sum of £2,500. Nearly a year has elapsed since this was done; and, meanwhile, we understand the scheme has been carefully elaborated and improved, until the directors estimate that they will be in a position to generate, transmit and sell electric energy upon the fields at the rate of 5s. per horse-power per day, instead of 10s. per day, as was estimated last year. Every necessary preliminary has now been completed, and options over private lands, and the requisite riparian rights for the generation of the electric power, have been secured at Newcastle and Northam, while powers have been sought to enter upon Crown and private lands, to erect poles thereon, and to carry overhead electrical conductors across any such lands.

EVIDENCE FOR THE ALLOTROPIC THEORY.

Written for the Engineering and Mining Journal by Henry M. Howe.

That iron becomes allotropic in the broad sense of that word, in the critical range of temperature, at and near a red heat, is shown by the fact that this metal, when not only nearly chemically pure, but apparently absolutely free from carbon, in cooling slowly through that range both regains its magnetic properties rapidly, and twice spontaneously emits heat at definite, well-marked temperatures.

The important question whether the retention of this allotropic iron by sudden cooling be one cause of the hardening of steel, would be answered affirmatively if it could be shown that some of the effects, which we group together under the general name of hardening, can be produced under such conditions that no cause other than this known allotropic suffices to explain them.

In a late paper presented to the Iron and Steel Institute, I collected cases in which iron, containing only very little carbon, was strengthened and embrittled to a degree too great, in my opinion, to be referred readily to the direct action of that carbon.

In the most striking case, steel, containing only 0.06% of carbon, had its tenacity thus nearly tripled, a result too great to be referred readily to the direct action of the trifling quantity of carbon present. Mr. Hadfield's objection to this evidence, that this great strengthening might be due to the 0.40% of manganese present rather than to allotropy, was by no means well taken, because the evidence which he offered in support of his view showed that iron, containing only 0.02% of carbon and very little of manganese or any other element had its tenacity increased by 35% and its elastic limit raised by 81%, by a cooling which was only moderately rapid. Considering this moderateness, his results agree with those which I had quoted; and, in view of the almost complete absence of all foreign elements, they seem to point strongly to allotropy as contributing to the hardening.

Mr. Hadfield, however, thought that stress might account for much of this.

To get further light, especially on the question of stress, I have made the experiments, which I will now describe. Several small bars of basic open-hearth steel, made under the direction of President H. H. Campbell, of the Pennsylvania Steel Company, and containing carbon, 0.04%; silicon, trace; manganese, 0.03; phosphorus, 0.007; sulphur, 0.014, and copper, 0.10%, all machined out of the same block of this steel, were treated as is shown in the following table:

HARDENING OF STEEL OF 0.04% OF CARBON (SERIES 29).

No.	Size, Inches.	Bored or not.	Size of holes bored, Inches.	Tenacity lbs per square inch.	Elastic limit lbs per square inch.	Elongation per cent. in 1 inch.	Contraction of area, per cent.	Treatment.
6	.162 x .174	Not	.....	48,580	23,050	44.	72.3	Cooled slowly from 930° C.
10	.187 x .201	Yes	.083 x .082	49,890	30,400	43.	77.8	Quenched in water from 930° C.
2	.176 x .181	Not	.....	52,040	30,400	43.	77.8	Quenched in ice brine from 930° C.
9	.183 x .198	"	.....	67,400	42,820	28.	58.56	Quenched in ice brine from 930° C.
3	.177 x .186	Yes	.073 x .074	70,690	.....	.....	.....	"
7	.178 x .197	"	.086 x .085	69,190	.....	.....	.....	"
8	.179 x .195	"	.087 x .088	62,450	.....	.....	.....	"

These bars were machined out of a solid block of this steel, were heated approximately to 930° C. in a double-walled copper muffle. Only very little scale was formed. The subsequent cooling was extremely slow, occupying several hours, as the bars were allowed to cool down in the furnace. While drilling the bars, I sprayed them with rhigolene to prevent them from heating.

The properties of the slowly cooled bar No. 6 are such as we should expect this material to possess in its normal state, and are confirmed by those of bar 10. Comparing it with bar 9, which was quenched in ice brine, we see that sudden cooling has apparently raised the tenacity by 39% and the elastic limit by 86%. These results appear to me too great to be referred to any direct action of the minute quantity of the foreign elements present. The two other causes thus far suggested are allotropy and stress.

I next proceeded to learn how far this result could be attributed to stress, by quenching bars 3, 7 and 8 in the same way, in ice brine, and then removing their interiors by drilling two transverse holes across each of them, the axes of the two holes intersecting, so that the remaining section consisted of four small rectangles, one at each of the four corners of the bar. This removal of the interior should greatly relieve the stress; nevertheless we find that these bars still show a great increase of tenacity, bar 3 thus drilled out being actually stronger than bar 9, which had not been drilled out, and 45% stronger than slowly-cooled bar 6. Hence I infer that stress is probably not an important cause of the strengthening here observed, especially as the strongest bar of all is one which should have relatively little stress, and as in a previous experiment I found that the stress in a quenched bar of 0.39 carbon steel seemed to be a source not of strength but of weakness.* The strengthening of these bars may thus be rather in spite of stress than because of it.

While the variations of tenacity between these three bars, 3, 7, and 8,†

* "The Metallurgy of Steel," pp. 32, 33.

† The differences between the tenacity of the three bars which had been drilled out after quenching are not, in my opinion, too great to be readily explained by the observed and the probable unobserved variations in the conditions. The fact that it is difficult to harden very low-carbon steel or iron appreciably, itself shows that, if it is possible to retain this allotropic variety of iron at all in the nearly complete absence of carbon, this can be done only by extremely rapid cooling; and we can readily understand that unnoticed variations in the rate of cooling, due to such causes as varying size of the bars, varying rapidity of movement in the quenching medium, varying thickness of the oxide crust on the bars, etc., etc., should affect this extremeness of the rapidity of cooling to such a degree as to account for these variations. In other words, to harden low-carbon steel at all is difficult; and not only is it natural that, in doing an essentially very difficult thing, we should do it with varying degrees of perfection, but it is indeed easy to fail in doing it at all. Bars 7 and 8 indeed agree very closely. The greater strength of bar 3 may in part be due to its being smaller, and hence cooling faster.

are readily understood, all four of the quenched bars unite in having far greater tenacity than the slowly cooled bars.

To show further that the great strength of the quenched and drilled bars is not due to their peculiar section as such, I cooled bar 10 slowly, and then drilled out its interior in the same way. This has not affected its tenacity materially.

It may be possible that these effects are due jointly to the direct action of the foreign elements so sparingly present, and to stress and other causes yet unsuspected. But it seems to me as difficult to explain them in this way as it is easy to explain them by supposing that the allotropic iron, shown by wholly independent evidence to form at high temperatures, has been in part retained by the rapid cooling, and that it is stronger but less ductile, with higher elastic limit, than iron in the normal state reached by slow cooling.

ELECTROLYTIC PRECIPITATION OF GOLD FROM CYANIDE SOLUTIONS.

Written for the Engineering and Mining Journal by Stuart Orcaedale.

The cyanide process has made rapid strides during the last few years, both from chemical and metallurgical standpoints. It has established itself in this country as a standard commercial process, ranking as high as its only rival, the chlorination process. Either process has its advantages and its disadvantages, and must be used with discretion according to the nature of the ore treated.

The precipitation or recovery of the gold from cyanide solutions has always been the most troublesome part of the process. So far nothing has replaced the cumbersome zinc shaving boxes, nor the equally bulky electrolytic precipitation tanks, although the latter seem to possess the elements of ideal precipitation.

The writer recently conducted some experiments on this part of the process for a cyanide company owning some new patents on a modification of the process. The experiments were conducted on a commercial scale and afford sufficient basis for larger estimates. Various methods and materials were used with more or less success, but the results were of value only as stepping stones to what follows and need not be recorded here.

The method finally decided upon was electrolytic precipitation, using amalgamated zinc plates for the positive electrodes and sheet lead for the negative electrodes. Zinc was chosen for the following reasons:

1. It will precipitate gold from cyanide solutions without aid from other sources.
 2. It is the most electro-positive metal available for this purpose, and with another metal more electro-negative it forms a galvanic couple that will precipitate gold from solution without the aid of an electric current.
 3. By combining with the above features a weak electric current zinc becomes especially active in precipitating gold from cyanide solutions.
 4. The price does not place it beyond a commercial possibility.
- Lead was used on the other pole for advantages already obtained in the Siemens-Halske process. The strength of current used was 0.04 to 0.05 ampere per square foot of depositing surface. The voltage was not determined, but was very low. The flow of solution (the value of which is seen below) through the precipitating tanks was such that each square foot of depositing surface received the gold from one-half pound of solution in 30 seconds.

The results of three experiments are given in the table below:

Exp. No.	Original solution, mgs. gold per liter.	Tailing solution, mgs. gold per liter.	Original solution, value per ton.	Tailing solution, value per ton.	Per cent. extraction.
1.....	11.56	0.32	\$6.30	\$0.283	95.50
2.....	12.24	0.658	6.67	0.629	99.56
3.....	14.56	0.137	7.94	0.075	99.06
Average.....	12.787	0.170	\$6.97	\$0.129	98.01

Experience proved that these results could be obtained day after day without difficulty. With lean solutions the capacity of the tanks or rather the flow of solution through the tanks was doubled and corresponded to one pound of solution to each square foot of depositing surface for every 30 seconds. The results were equally satisfactory, as given below:

Exp. No.	Original solution, mgs. gold per liter.	Tailing solution, mgs. gold per liter.	Original solution, value per ton.	Tailing solution, value per ton.	Per cent. extraction.
1.....	1.84	0.12	\$1.00	\$0.065	93.46

The zinc plates at the end of the experiments showed little or no wear. The thin amalgamated surface prevented polarization, and kept the surfaces bright.

The destruction or loss of cyanide is shown in the following table:

Exp. No.	Original solution, per cent. KCN.	Tailing solution, per cent. KCN.	Decrease in strength of solution, per cent. KCN.	Per cent. loss of KCN.
1.....	0.74	0.6750	0.0650	8.780
2.....	0.65	0.6330	0.0170	2.600
3.....	0.64	0.6400	none	none
4.....	0.57	0.5700	none	none
Average.....	0.65	0.6295	0.0205	2.845

The cyanide solution as it came from the precipitating tanks was remarkably active in dissolving gold, due, no doubt to the presence of nascent oxygen—which makes it especially valuable for treating the next lot of ore in the leaching vats. This increased solvent action was fully as great as that produced by the addition of sodium peroxide or similar compounds to ordinary cyanide solutions, while the destruction of cyanide was apparently not so great. The addition of salt to the cyanide solution would, no doubt, be beneficial not only to help carry the current through the electrolyte, but also to cause the slimes to settle more quickly before passing into the precipitating tanks. The current is not sufficient to decompose any of the salt.

To show the value of having the electrodes as electro-chemically

different as possible and yet preserve the commercial side of the question, the following experiment is given: Sheet lead was used for both electrodes, which is neutral as far as galvanic action is concerned until the negative pole becomes coated with gold. The current had to be increased from 0.04 ampere to 0.2 ampere per square foot. The plates had to be removed from the solution as soon as the current ceased, to prevent a re-solution of the gold. With the zinc-lead couple the plates could remain any length of time in the solution without any re-solution of the gold so long as the switch was closed and the galvanic couple preserved. The solution as it came from the tanks was inactive and had a soapy feel, although it became active after standing. This feature was probably due to the nature of the electrodes. A large amount of gas was formed by the increased current, which made an undesirable foam on top of the solution. The recovery of gold from solution, however, was 94.34% and the destruction of cyanide was only 5.15%, the solution decreasing from 0.68% to 0.645% or 0.035% loss.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

At the opening session of the annual meeting of the American Society of Mechanical Engineers, held in New York City, on December 1st, the annual address was delivered by the president, Mr. John Fritz. His subject was: "Progress in the Manufacture of Iron and Steel in America and the Relations of the Engineer to it," and in it he followed generally the lines of his interesting historical paper in *The Mineral Industry* Vol. IV. He first spoke of the trials and risks attendant upon the introduction of steel making, and then reviewed the early processes of making iron and steel, saying that prior to 1838 the manufacture of pig iron was in a primitive condition, that metal being practically all made in charcoal furnaces, producing from 15 to 30 tons per week, and was converted into wrought iron in the old-fashioned charcoal fires, and was shaped into blooms for the rolling mill and into bars for the smith by a helve hammer. The furnaces, forges and mills were all driven by water-power. In 1840 the use of anthracite coal and coke in blast furnaces was commenced. This required a much higher pressure of blast. In 1842 puddling began to come into more general use, and puddling trains had to be built, and better merchant or bar trains were now required.

Finally the Burden squeezer was invented and adopted by the mills generally, and to this day is the best machine that has ever been devised for the purpose. In or about the year 1848 "boiling" came into use, which was a great improvement over ordinary "puddling," and gave a new impetus to the trade. From 1848 to 1856 no marked improvements were made in the business. In 1857 the three high-rail mill was successfully introduced, and in a very short time practically revolutionized the manner of rolling rails. In 1864 the Bessemer process was introduced and gradually developed with much care and labor.

In 1866 the Siemens open-hearth furnace for making steel was introduced, but it was some time before it came into general use; the Bessemer for quite a while held it in check. To-day it occupies an important position, and, in connection with the Thomas basic process, one of the great metallurgical inventions of the age, is sure to become a strong competitor of the Bessemer process. Mr. Fritz then gave a description of machine tools that he had been familiar with in various shops, dating as far back as 1832. In concluding this subject he said that the great improvement which has taken place in the manufacture of steel, both in quality and quantity, and its general adoption in machine building; the using of steel higher in carbon, the introduction of nickel and the treatment by oil tempering, have rendered the tools already referred to practically useless for a very large part of the work that is now being done; consequently new tools are required that are much heavier and more powerful than any that had been built up to this time. The Bethlehem Iron Company has four lathes in use, all of the same pattern. One of them is used for what is called a cutting-off lathe and frequently employs 12 tools, six on each side, made out of the best steel that can be had, size 1 x 6 in., and are forced to cut all they will stand. These lathes have had work in them weighing over 190,000 lbs. They have planers that have finished castings that each weighed 165 tons.

Shafts, 18 or 20 in. diameter, 60 or 70 ft. or more in length, all bolted solidly together, laying in V's, can be turned easily by one man with a lever 36 in. in length; this proves the high character of the work.

Mr. Fritz then took up the subject of forgings and explained why iron forgings welded and shaped under a hammer did not give satisfactory results, and how essential it is that steel of proper quality must be used for steel forgings. He gave a brief description, in connection with hollow steel forgings, of the process and how the ingot is prepared.

In conclusion, he said that the modern practice of steel making has, in the hands of the mechanical engineer, the metallurgist and chemist, wrought wonders in producing material which in quantity, physical qualities and cheapness would have been regarded as utterly impossible half a century ago, when steel rails, beams, angles and plates were not thought of, and steel was regarded as a luxury of the material of the working artisan. The labor of the men of iron and steel has so cheapened their products that to-day we are enabled to use steel for the commonest purposes as well as for the most expensive articles produced by the skill of the mechanic. No article is too humble to be made of it, and no structure so grand and important as to refuse its services.

The first business session was held December 2d. The annual report of the Council showed that the membership of the society is as follows: Honorary members, 16; members, 1,342; associate members, 104; junior members, 300, making a total of 1,762, not including the 65 life members.

Last spring the Council prepared a memorial to Congress addressed to the Committee on Naval Affairs of each house on the question of the standing of naval engineers and a circular number sent to the membership requesting their personal and individual co-operation.

A committee has been appointed to prepare such material as may be necessary for use in opposition to legislation seeking to make the metric system and its use compulsory in the United States. The committee consists of Coleman Sellers, Prof. John E. Sweet, Charles T. Porter, George M. Bond and Coleman Sellers, Jr.

The report of the Finance Committee and of the Library Association showed both to be in the most flourishing condition. The total receipts during the past year have been \$28,869. Of the \$32,000 worth of bonds

issued by the Library Association the Council of the Society at the present time holds \$21,800.

The report of the tellers of election showed the following result: President, Worcester R. Warner, Cleveland, O.; vice-presidents, E. S. Cramp, Philadelphia, Pa.; S. T. Wellman, Cleveland, O.; W. F. Durfee, New York, N. Y.; treasurer, William H. Wiley, New York; managers, H. S. Hames, Atlanta, Ga.; Gus. C. Henning, New York; A. Wells Robinson, South Milwaukee, Wis.

The committees on methods of tests, on tests of fireproof materials, and on standard methods of boiler testing reported progress.

A large number of interesting papers were read at this meeting. Among those attracting special attention was one by Sir Henry Bessemer, "An Historical and Technical Sketch of the Origin of the Bessemer Process," which gave a full account of his early work in the development of the process. Another paper, interesting from the historical point of view, was by W. P. Bonner on "Ancient Pompeian Boilers." Carefully written papers by Prof. R. H. Thurston on "Promise and Potency of High-Pressure Steam," and by F. H. Boyer on "Work and Cost of a Refrigerating Plant," may be named; and others also deserved attention.

RUBIES.

At the Imperial Institute in London, recently, Professor J. W. Judd delivered a lecture on "Rubies, Natural and Artificial," with special reference to their occurrence in the British Empire. Professor Judd, in his opening remarks, said the ruby maintained its position still as the material which embodied the highest money value in the smallest possible compass. There was a prevalent belief that this distinction belonged to the diamond, but such was certainly not the case. He had the best authority for stating that a ruby of five carats was from 10 to 12 times the value of a diamond of the same size, even though the latter were of the first water. Still larger rubies showed even greater excess in value as compared with diamonds of their own size.

The true ruby was a red variety of crystallized oxide of aluminum. What was commonly spoken of as "the great ruby in the British crown" was no ruby at all, but really a spinel. Some of the localities in which small forms of the gem were found were next described, the lecturer stating that but little was known as to the truth of the assertion that they were found in Afghanistan and Tibet. Upper Burma, he said, had long been known as the source of the finest rubies, also of that wonderful red stone, the rubellite, which was not highly prized by jewelers in the Western world, but which was regarded by the Chinese as the most precious of all stones. With the aid of sketches and photographs shown upon a screen, he gave a description of the general character of a mining district and the methods of obtaining the gems, remarking that the most wonderful ingenuity was shown by the Burmese in the way in which they employed the most primitive appliances in carrying on mining operations, and that the question of abolishing primitive methods of working and substituting hydraulic methods needed a great deal of consideration. Rubies were found scattered through the rock of the limestone itself, and it was impossible to remove these gems by blasting owing to the danger of shattering them, and other means were unknown. He dealt, in conclusion, with rubies made artificially, and the tests for distinguishing them from the natural gem.

The Russian Institute of Mines.—In St. Petersburg, November 19th, a special celebration was held on the centennial anniversary of the death of the Empress Catherine II. The Imperial Institute of Mines, which was founded by Catherine, held an extraordinary assembly of officials, professors, students and representatives of metallurgical industries, at which M. Yermoloff, the Minister of Domains and Agriculture, decanted upon the benefits of the work started by the great Empress, and announced that the Czar had been pleased to confer upon the institution the title of Mining Institute of the Empress Catherine II. The Academy of Sciences, the Free Economic Society and other institutions and public bodies owing their origin to the brilliant rule of the second Catherine also celebrated the day.

Graphic Presentation of Statistics.—At a recent meeting of the Royal Statistical Society in London, the president, Mr. John Biddulph Martin, dealt with the graphic method of statistics, with reference to the various forms of expressing statistical totals by geometrical figures, accompanied in some cases by the employment of colors. It was to be regretted that the use of the graphic method, which had sprung up automatically, had not been developed on any conventional lines. Were the employment of particular graphic forms invariably applied to the exposition of the same phenomena, and if this conventional agreement could be made international, the interpretation of statistics graphically presented would be vastly facilitated. Reference was next made to the application of the higher mathematics and the laws of probability to the elucidation of statistical problems, and an historical account of the development of the idea of index numbers was given.

Force of Water Under High Pressure.—The handling of water under the enormously heavy pressures obtained in many Western water-power plants is a very interesting problem. In the Fresno, Cal., water-power plant, where Pelton wheels are used under a head of 1,411 ft., the following interesting phenomena are described in the *Electrical Review*, by Mark A. Replogle: "A sudden stopping in the water flow, on one occasion, raised the hand on the pressure gauge to the astounding height of 1,000 lbs. per square inch, and the pressure returned to nearly a like distance below 610, and kept up reverberating for over 30 seconds. The great pipe writhed like a huge serpent, and the commotion in the interior sounded like the firing of distant cannon. The great strength and elasticity of the steel are the only safeguards in such sudden changes of flow. The water is applied to the Pelton wheels by the use of deflecting nozzles. A stream of water from one of these will bore a hole through a 3-in. plank in a few minutes; it will tear a hole through a 4-in. piece of steel in a few days; concrete melts before it like sugar."

THE GOLD BELT OF PITKIN, GUNNISON COUNTY, COLO.

Written for the Engineering and Mining Journal by J. E. Holibaugh.

Pitkin is one of the old mining camps of the State, having come into prominence in 1880 by the discovery of rich silver mines; but with the decline of silver the mines were mostly closed down and have remained in a dormant condition up to within the past year, when new life was infused into this district by the opening up of a gold-producing belt, south and adjacent to the silver belt. The silver mines are located in a lime belt similar to the districts of Leadville, Rico, Red Cliff and Aspen, and this has been well developed in mining and then prospected by diamond core drills to depths of 400 to 600 ft. A diagram and cores from the borings proves that there are five distinct mineral contacts, four of which carry high-grade ore and the other good milling ore. I only refer to the silver mines here as their development led to the opening up of the gold mines.

The gold belt, as before stated, is located south and adjacent to the silver belt, but is in an entirely different geological formation. I have spent some time in making an examination of the prospects and developed mines now in operation. Geographically, the present development is confined to an area bounded by Ohio Creek on the south and Quartz Creek on the north-east. I commenced my examinations at the junction of Ohio with Quartz Creek. Ohio Creek flows through a clear-cut canyon, and gives a fine exposure of the true country rocks, which are hornblende, schist and gneiss through which occur quartz and feldspar veins, and defined porphyritic dikes. I found evidence of old workings on some of these quartz veins, also of placer mining, and was informed that in the early days considerable free gold had been mined. There are located here three mills, one stamp mill, one cyanide mill and the Gold Brick chlorination works. The last-named mill was erected at a large expense and is equipped with modern machinery, but has remained idle for a long time. It will soon be in running order under new management.

After finishing my examinations along the line of Ohio Creek, I ascended the slope of the mountain and found that there are two types or systems of veins. One system cuts the formation by seams and fissures, and the other includes large quartz and feldspar veins parallel with the creek, which may be called contact veins, as they occur at a line of contact of the porphyritic dikes and the gneiss and schist. Most of the prospecting and development work has been done on these contact veins.

The first property examined was the Golden Islet mine, owned and operated by Mr. Rudolph Heffner. This consists of three lode claims and one placer claim located in Jones' Gulch, developed by two adits or tunnels driven in directly on the vein. This is a contact vein with a course of north 15° east and a dip of 40°; there is about 1,400 ft. of development with the vein proved up to be 3 to 5 ft. between walls. The vein matter is a rusty quartz somewhat oxidized at and near the surface, but as depth is gained the ore changes into iron pyrites. Some 700 tons of ore have been shipped from the upper level, which was the rusty quartz, and this gave returns in the stamp mill of \$20 per ton; and 27 tons of the sulphide ore from the lower level gave smelting returns of \$2,400, or a total production for the gold value of \$16,400. Mr. Heffner now proposes to open up the third level near the bottom of the gulch. By crosscutting the vein on the Montezuma claim, this crosscut will cut the Golden Islet veins at a vertical depth of 800 ft., and will drain the entire upper workings.

The next property of importance is the group of mines owned by the Dunraven Gold Mining Company, of Chicago; this group comprises 21 claims, but the most important development is on the Sacramento mine, of which Mr. J. F. Pearson is superintendent.

The mine is developed by three tunnels driven into the steep side of the mountain, directly on the vein. We made the examination chiefly in the middle tunnel, which has been extended a distance of 1,600 ft., and connects by upraise and winze with the lower and upper tunnels. The entire workings of this property disclose a clear-cut and well defined vein of decomposed quartz, much honeycombed and rusty with iron oxide. In the middle tunnel is found a well defined fault at about 300 ft. from the entrance. This appears to be a throw of 10 to 15 ft. to the east, and still further in the vein splits. These features are interesting from a structural standpoint. Time is needed to work out their causes or relations to the true vein. A large amount of ore has been produced from this development work, and the average smelting returns are \$65 per ton, while \$250,000 worth of ore has been sold. The values proportionally are 60% gold and 40% silver. The Dunraven Company is now driving a crosscut tunnel from Ohio Creek called the Gold Link Tunnel. This will cut the vein at a depth of about 1,400 ft. and 700 ft. below the present workings.

The Gold Eagle mine, located in Dutch Gulch, was purchased last May by parties from Muscatine, Ia. They commenced active development, and now have two tunnels and 750 ft. of the vein opened. They are now employing 12 to 15 men on ore and making regular shipments to smelters and receiving returns of \$80 to \$100 per ton and over for some of the best grades of ore.

There are many other well-developed gold properties in this comparatively new and unexplored gold belt which give promise of being productive gold mines. The district cannot boast of picked specimens giving wonderful assay returns, but mill and smelter returns give good values. The veins are strong and well defined and easily mined, as the majority of the mines are operated entirely by tunnels driven directly on the vein or by crosscutting. There is an abundance of spruce timber for all mining purposes, such as mine timbers and buildings. There is also an abundant supply of water for mill purposes and the mines are accessible by good roads, either winter or summer.

J. DUTTON STEELE.

Written for the Engineering and Mining Journal by John H. Steele.

J. Dutton Steele was the eldest son of John D. Steele, who migrated with his family from England in 1795, and first settled in Whitmarsh Township, Montgomery County, Pa., where he resided for seven years, after which he married Ann, daughter of Hugh Exton, of Hunterdon County, N. J., and purchased a tract of land in Chester County, Pa., upon which he resided during the remainder of his life. There J. Dutton Steele was born on March 18th, 1810, and at the age of 18, after being educated in the schools of Chester County, he joined a corps of engineers engaged in the surveys for the internal improvements of Pennsylvania, and continued in the service of the State for two years. In 1830 he entered the employ of the Baltimore & Ohio Railroad, the construction of which had then been commenced, and continued in that service for 10 years, chiefly as assistant engineer in charge of construction.

Mr. Steele continued in the service of the Baltimore & Ohio until the rails reached Harpers Ferry and Washington, D. C., and during an interval in that service he located the road between Troy and Ballston Springs, in the State of New York. His last work with the Baltimore & Ohio was in connection with the location and construction of the Western Division, from Cumberland, Md., to the Ohio River.

In 1837 he was married to Elizabeth, daughter of Judge Thomas Capner, of Hunterdon County, New Jersey, and settled in Wheeling, W. Va., from which point he conducted an extensive system of surveys necessary for the location of the railroad. The great financial breakdown of that period, however, caused the company to suspend the construction of their road west of Cumberland, and consequently his engagement terminated with them in 1840. He then purchased a farm near Downingtown, Pa., and remained there for six years. During this period the country had recovered from its depression, and the charter of the Baltimore & Ohio Railroad Company through Southern Pennsylvania having lapsed, the company applied to the Legislature for a renewal of the chartered privileges; but at the same time the Pennsylvania Railroad Company was applying for a charter through the middle of the State; hence the remarkable "right-of-way contest" in which his familiarity with the topographical features of the region to be traversed enabled him to take an active part, and in which the Baltimore & Ohio failed to obtain a renewal of the charter asked for.

In 1846 he made a survey of Pittsburg and its environs for the purpose of indicating the practicable routes for entering that city.

He entered the service of the Philadelphia & Reading Railroad Company on January 1st, 1847, and was in charge of the roadway department in the several capacities of chief assistant engineer, chief engineer and vice-president until 1867, a period of 20 years. During this time the bridges on the road were nearly all replaced with permanent structures and the superstructure was renewed, an accurate survey was made of the Schuylkill coal fields, the shipping facilities at Port Richmond were enlarged and improved, and the rails were extended into the Mahanoy Valley and to Harrisburg. He introduced into railroad practice the ribbed stone arch for skew bridges. He introduced in this country wrought-iron girders for bridges of short spans. He was the first to use electricity as an auxiliary to rock blasting to any considerable extent, with no lights to guide him but some experiments which had been made in English stone quarries. Without this aid the tunnels on the Reading Railroad could not have been widened in the brief space of four months allotted for the completion of the work.

In 1854-56 there were built on the Philadelphia & Reading Railroad two important stone-arch bridges at Peacock's Locks and at the Falls of Schuylkill. Both were built without stopping traffic on the road, and both have proved to be structures of extraordinary strength and durability. The following descriptions of these bridges are condensed from a paper on "Skew Bridges," read by Mr. Steele before the American Society of Civil Engineers in 1870:

Falls Bridge, over the River Schuylkill, on the Philadelphia & Reading Railroad, is a stone structure with six arches of 83-ft. span and 24-ft. raise. Each arch consists of ribs 3 ft. x 3 ft. in the section, and each rib sits 18 in. back of its fellow, making a skew of 12 ft. in a width of 24 ft. The first suggestion of ribbed arches was made by Mr. Benjamin H.

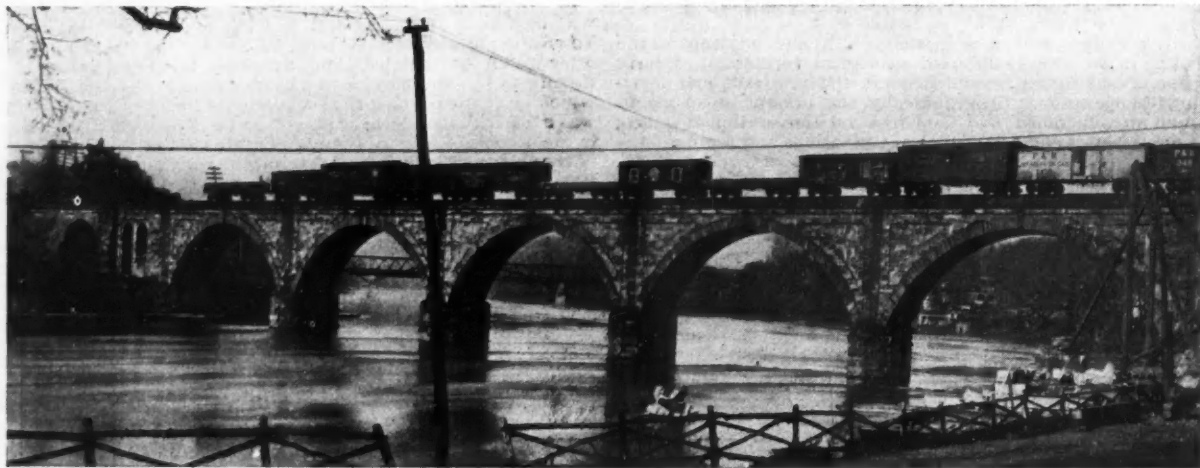


J. DUTTON STEELE.

Latrobe, and full credit was given to that great engineer by Mr. Steele. The first ribbed-arch bridge for sustaining the weight and jar of railroad trains in this country was built on the line of the Philadelphia & Reading Railroad in 1848, at a point known as Third Crossing. It is a stone structure, with three spans of 42 ft. and a raise of 12 ft. Each arch consists of four square-built ribs, with a backset of 1½ ft. and a skew of 5 ft. Circumstances made it necessary to remove the centers from this structure as soon as the arches were keyed, and for an entire winter they sustained the heavy traffic of that road unaided by backing or spandrels, and thus their sufficient stability was demonstrated in the most practical manner. This bridge was duplicated by Mr. Edward Miller on the Pennsylvania Railroad about a year later, after which the system came into general use.

The designs for Falls Bridge were made in 1852, and the work was commenced in 1853 and finished in 1856; it was the most elaborate applica-

tion of ribbed arches of its date. The feature in its construction which has attracted most attention is the fact of its occupying exactly the same site as did the wooden structure for which it is a substitute. The most difficult part of the work was the foundations. The Falls of Schuylkill, which gave name to the locality, were originally a considerable rapid in the river, where the waters found their way among granite boulders at the head of tide. These boulders had been connected with deposits of riprap, forming wing-dams to drive machinery, and at a later date both the boulders and riprap had been submerged to a depth of 5 or 6 ft. by the construction of Fairmount dam of the Philadelphia water-works, and stern-wheeled steamboats plied over them. Thus it was that the rock bed of the river had become covered with masses of loose stones to a depth of 5 or 6 ft., with about an equal depth of water over them. As coffer dams could not be founded upon these loose materials, their sites



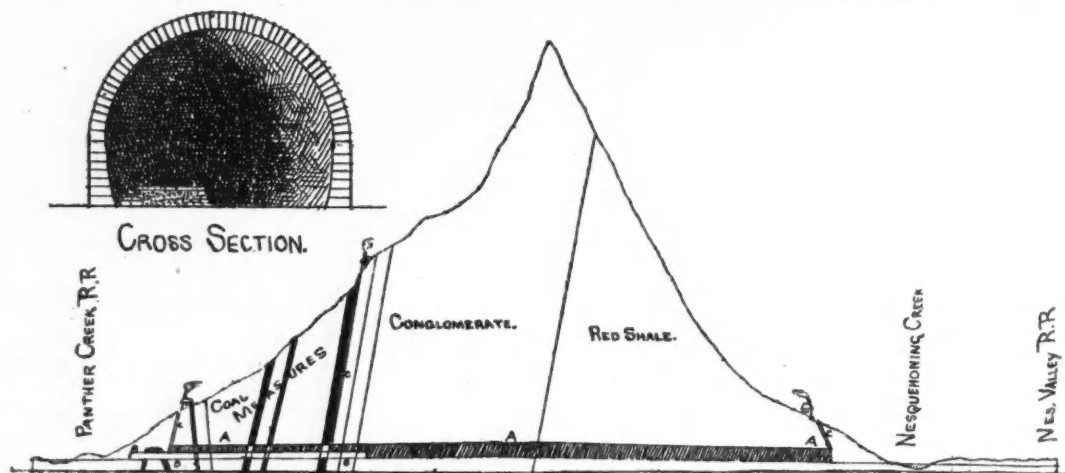
THE FALLS BRIDGE OVER THE SCHUYLKILL RIVER.

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trains caused more vibration than was desirable, and tie-rods were placed across the arches, binding the keystones on either side together, for the purpose of steadying the ribs while the spandrels were being built.

The plan of the Peacock's Locks Bridge was a ribbed arch of 76-ft. span and 23-ft. raise over a canal. It was necessary to turn this arch in a severe winter, with the temperature considerably below freezing point from the time the first stone was placed until the centers were removed, and it was necessary to observe the settling of the ribs as the frost left the mortar. They separated at one point as much as 3 in., but retained their stability perfectly, and after the cracks were filled and the spandrels built no further derangement took place, and it would take a close observer, at this day, to discover any of the injurious results of that hard and, as many thought, precarious winter work.

In 1859 Mr. Steele was made vice-president of the company; in 1862 he



SECTION OF THE NESQUEHONING TUNNEL.

were cleared with diving bells before they were sunk, that the filling might rest upon the rock. Foundations were obtained in from 12 to 15 ft. of water, and in all cases the cut-stone masonry not only rested upon, but was fitted to, the rock bed of the river. The diving bells were made of plate iron and supplied with air through a hose attached to the top. The workmen remained in them five hours at a time, and the air was changed every 15 or 20 minutes. Two of the piers occupy the same places as did the piers of the old structure, in which cases strong trestles were placed inside of the coffer-dams to sustain the wooden superstructure while the old piers were being removed and the new substituted for them. Two seasons were occupied in obtaining the foundations and raising the piers to the springing line, and one in turning the arches and building the spandrels.

In describing the mode of turning the arches without interrupting the traffic upon the railroad above, or on the river below, it must be observed that the structure which they took the place of was a deck lattice bridge, the bottom chord of which was 5 ft. above the springing line of the stone

resigned the office of vice-president and again became the chief engineer of the railroad.

In 1868 he was elected president of the Sterling Iron and Railway Company, and removed to Brooklyn, N. Y., and assumed the duty of developing an extensive iron-ore property in Orange County, N. Y., in which position he continued for three years. During this period he made explorations for railroad extensions in the States of Michigan, Wisconsin and Minnesota; took active part in organizing the American Society of Civil Engineers and contributed to its *Journal*, and was appointed one of a commission of civil engineers to examine and approve the plans of John A. Roebling for the East River suspension bridge. In 1870 he returned to his residence in Pottstown, Pa., and was in charge of the construction of the Nesquehoning Valley Railroad and the Nesquehoning Tunnel, in Carbon County, Pa., and in the latter work, availing himself of the experiments then in progress at the Hoosac Tunnel, made use of compressed air as a motive power for rock drills. The following description of that tunnel is condensed from a report made

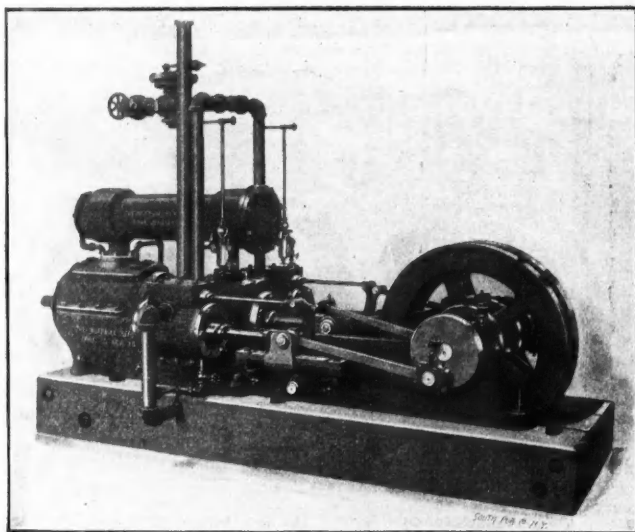
by Mr. Steele himself. The drawings show in Fig. 1 the cross-section of the tunnel; in Fig. 2 a section through the mountain giving the work already done in the old mining tunnels. The entire length of the tunnel between the portals is 3,800 ft. The old mining tunnel No. 7 provided a heading of 1,200 ft. of this distance and 2,600 ft. remained to be cut into the mountain; 1,000 ft. of this is conglomerate and 1,600 ft. red shale. Fig. 1 shows the arching for a double track; where arching was not required a single-track tunnel, 16 ft. wide by 19 ft. in extreme height, was made. The ascent northward to the middle of the tunnel was at the rate of 3.2 ft. per mile, and thence the descent to the north portal was 6.4 ft. per mile, which furnished the necessary drainage. The two shades on the body of the tunnel (Fig. 2) show the extent of the excavation.

Mr. Steele was next appointed to select the location for the extension of the Baltimore & Ohio Railroad from Central Ohio to Chicago, and, after the necessary surveys, recommended the route upon which the road was built. He was also engaged on the Wilmington & Northern, the Berks County Railroad and other works of lesser importance. He afterward organized and established the J. D. Steele & Sons Manufacturing Company, at Pottstown, Pa., and thus ended an active and conspicuous professional career. He continued in the business of car building and general foundry work, also acting as consulting engineer to the county commissioners, and making a number of surveys for county bridges, until his death on June 13th, 1886.

Mr. Steele was one of the group of great engineers who began the building of our railroad system and who had to work out for themselves the many and complex problems involved. Benjamin H. Latrobe was at the head of this group, and it included such other men as John B. Jervis, Edgar Thomson, Horatio Allen, Ashbel Welch, Josiah White and Edwin Stevens. Mr. Steele's best and most lasting memorial is the Reading Railroad, which was practically rebuilt and grew into shape and strength under his charge.

A NEW TYPE OF AIR-COMPRESSOR.

The accompanying illustration shows a type of triplex air-compressor recently designed by the Ingersoll-Sergeant Drill Company. It can be used economically for small powers which have heretofore been con-



INGERSOLL-SERGEANT TRIPLE TYPE AIR COMPRESSOR.

sidered too low for the use of compressed air with good results. It has proved capable of working well down to the 25-H. P. size. In designing this type it was the endeavor to combine in the triplex all the good features of every other compressor and it was specially intended to be a compact, economical, high-duty machine, which is much in demand at present for shops and mills.

The advantages claimed for this machine may be summarized as follows: It is self-contained and compact, using little or no foundation; it has duplex steam cylinders, with steam cranks at 90° and air cranks at 135° from each steam crank; it has tandem compound air cylinders with perfect inter-cooler; the fly-wheels are in direct line with the air cylinders where the work is expended; all parts are easily accessible; it can be arranged with air cylinders for any pressure. The steam cylinders can be made cross-compound, if desired, and, finally, the piston inlet valve is on the low-pressure air-cylinder, all other inlet and discharge valves having vertical lift.

A typical triplex compressor of this class has two 7×9-in. steam cylinders, with 7½ and 12½×9-in. tandem compound air cylinders, and was built for 75 lbs. air pressure, using 90 lbs. steam pressure. At 150 revolutions per minute it will furnish 175 cu. ft. of free air.

In all air compressors the hard work is done by the fly-wheel. In a regular duplex machine the steam is cut off and the fly-wheel is forcing the air piston against the maximum resistance, doing this work around the angle of the pillow block. With the triplex this work is done by two fly-wheels acting in direct line with the rod, thus gaining a great advantage in steadiness and reducing the strain on the working parts.

A NEW COAL SCREEN.

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

A coal screen of novel design is now being introduced in the West. The screen proper is made up of cast-iron wheels set on shafting. These wheels are ½ in. thick and the circumference is corrugated. There are

nine shafts, carrying wheels, and cast-iron washers so separate the wheels as to make apertures, varying from ¼ in. to 1½ in. in width. Upon one extremity of the shafts, carrying the wheels, is a pinion, geared to a shaft, running at right-angles to the screen shafts. The large shaft has a sprocket-wheel upon one extremity. The screen shafts all revolve from right to left, thus keeping the coal upon the screen and preventing the grinding of the coal. The screen pitches from left to right.

Coal is screened by passing through the apertures between the wheels. This screen does not require as much space as ordinary screens, being but 9 ft. square, and does not require as much pitch as the bar-screens. The machine is said to give satisfaction, but at the present time there is only one in operation. This is at the Coal Valley mine, in Iowa. This screen is made by the Duncan Foundry and Machine Company, of Alton, Illinois.

A Large Electric Locomotive.—The Baldwin Locomotive Works and the Westinghouse Electric Company, have turned out an electric locomotive for high-speed passenger service for which claims of a speed of 120 to 150 miles an hour are made. There are two trucks, and the framework is of steel. The motors are concealed in jackets of steel. Contacts for use on the third-rail system are provided.

A New Use for Compressed Air.—In the Fisher Building in Chicago, and other office buildings in several cities, compressed air is used to run clock mechanism in each office. The mechanism is controlled by a master clock which is kept correct by the most approved methods, and the dials distributed through the offices cannot vary more than 30 seconds, fast or slow, from it. The dials have only the mechanism necessary to move the hands.

Another Large Electric Power Transmission Plant.—Work is proceeding satisfactorily on the massive new dam of the St. Anthony Falls Power Company in the Mississippi River at Minneapolis. The Twin City Rapid Transit Company will utilize the power obtained from the new dam—estimated to be 10,000 H. P.—and transmit it electrically, and the engineers are now going over the details of the project. The St. Anthony Company will install 10 horizontal turbines of 1,000 H. P. each; and these will be directly connected to a like number of alternating current generators by the Twin City Company, which leases the power at the water wheels. The electrically transmitted power will be used to operate the cars on the extensive electric railway system of St. Paul and Minneapolis by means of rotary transformers. If there is more power than is needed for this purpose it will be sold or utilized in other ways. The Twin City Company will furnish the electrical apparatus, and alternating current machinery offered by the General Electric, Westinghouse and Stanley companies is under consideration. The distribution will probably be underground, and the existing steam plants will be retained as reserves. When completed the plant will rank as the second or third largest water-power transmission in the country.

Funny Ideas About the Roentgen Rays.—Last week I was assisting at a large bazaar, says a correspondent of the *London Lancet* by holding a small Roentgen ray gallery, comprising a Crookes tube, glowing, etc. As I in my temporary rôle of curator encountered many gems of unconscious humor, I venture to forward you a specimen or two as showing how a new-born scientific discovery is "understood of the people." An elderly gentleman of prosperous appearance objected that the show was not "up to date," as he had read somewhere in a newspaper "that now you can see the liver palpitating and the heart circulating." Two elderly ladies entered the small room, and, solemnly seating themselves, requested me to close and fasten the door. Upon my complying, they said they wished "to see each other's bones," but I was "not to expose them below the waist-line," each wishing to view the apparently dismantled osseous structure of her friend first! A young and anxious mother asked me to see if her little boy had really swallowed a threepenny bit, as he was uncertain himself. She had read in the papers that a great doctor, Sir Something Blister (fact), in a speech in a large meeting in Liverpool a little while ago, said that a half-penny had been seen in a boy's "sarcophagus!" A young girl of the domestic servant class, taking advantage of her opportunity, as she thought, and my sex, asked me in confidence if I would "look through her young man unbeknown to him while he looked at the picture, to see if he was quite healthy in his internals."

Coinage of the Australian Mints.—The total receipts of gold for coinage by the two mints of the Australian colonies for the nine months ending September 30th amounted to 1,358,559 oz., against 1,319,539 oz. for the corresponding period last year, showing an increase this year of 34,020 oz., or 2.6%. These receipts are not, it must be understood, the whole production by any means, since a considerable quantity of gold is shipped in the form of bullion and does not come into the mints at all. The Melbourne Mint receipts are drawn chiefly from Victoria, New Zealand, South Australia, Tasmania and Western Australia; those of the Sydney Mint come from Queensland and New South Wales. The receipts are of interest, not as giving the production, but as an indication of its course.

Comparing the receipts in detail we find that three colonies show increases in the quantities delivered to the mints this year, New Zealand gaining 12,511 oz., or 19.4%; Tasmania, 9,982 oz., or 25.6%, and Victoria, 53,744 oz., or 10.2%. The other four colonies show decreases, New South Wales losing 12,789 oz., or 9.0%; Queensland, 8,923 oz., or 2.5%; South Australia, 13,054 oz., or 37.6%, and Western Australia, 7,451 oz., or 4.6%. From the last-named colony the bullion shipped direct and not included in this mint statement is believed to have been a large amount.

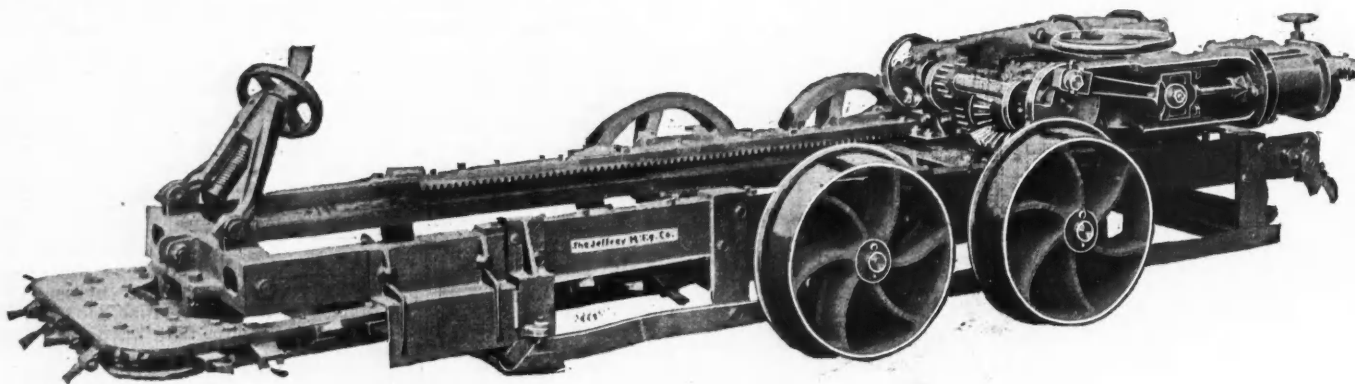
The amount received at the two mints, the origin of which is not stated, and which is classed as unknown, was about 10,000 oz. Among the miscellaneous receipts at the Melbourne Mint there were included 259 oz. gold from Borneo.

A CHAIN COAL-CUTTING MACHINE FOR LOW VEINS.

Illustrated herewith is a machine built for cutting coal in low veins. The demand for a machine to undercut coal in veins from 2 to 3 ft. has been so great that the Jeffrey Manufacturing Company, of Columbus, O., has recently built a machine peculiarly adapted to working in such veins. It has long been a question whether or not a breast machine would pay in veins lower than 3 ft., the time required to load the machine on the truck and move it from point to point being so great that the expense incurred in these operations would largely affect the advantage that would be gained by the rapid undercutting of the coal. After investigating the question thoroughly it was decided that an air machine to work successfully in low veins could be built, at the same time keeping cost down to that of the standard machine; with the result that a machine such as illustrated was designed and built.

The first machine was built in February, 1896, and shipped to the mines of a company working a seam 30 in. thick. This machine was tested and accepted within two weeks after it was received, the conditions of its acceptance being, that it should prove successful in reducing the cost of mining coal in their 30-in. seam. That this machine proved itself of value in operating under these conditions is shown by its early acceptance and receipt of orders for additional machines.

This machine is of the standard chain type and built for hard service. The chain, engines and entire equipment are of the latest improved type. It consists of practically three parts, the bed-frame, the sliding chain-cutter frame and the motor carriage. The bed-frame consists of two rectangular steel channel bars and two steel angle bars, fastened together by means of heavy cast-steel and wrought-iron braces. On this bed-frame are mounted, as will be seen by the illustrations, the feed racks, which are made of the best rolled steel and have machine-cut involute teeth. These racks are made up in sections, and should a tooth be broken, the section can be quickly and easily replaced. The rear end of the bed-frame is provided with hooks for moving the machine, and a cross-bar, on which rests the jack for taking the backward thrust of the machine. A heavy steel cross-girder joins the channel bars at the front end of the bed-frame. On the top of this rests the front inclined jack, which is made of cast steel with machine-cut thread and jack-wheel. On the under side of this cross-girder the guides for the center rail of the sliding cutter frame are placed. They consist of two adjustable steel guides of extra length, to give large



THE JEFFREY AIR CHAIN COAL CUTTING MACHINE FOR LOW VEINS.

wearing surface to the composition gibs, which form the bearing of the center rail. Great care has been taken in designing this bed-frame to have it strong and rigid, so that no bending can be caused by the inequalities in the floor of the mine or the jacking down of the machine, doing away with increased friction, which must necessarily follow where a light flexible bed-frame is used.

The cutter-frame is simple, consisting merely of one steel center rail, a cutter-head and two side guides for the cutter-chain. This sliding frame is contained wholly, with the exception of the cutter-head, within the stationary bed-frame, insuring protection to persons working around the machine, and when the machine is being transported from one place to another. As this portion of the machine is the one that has to come in direct contact with the coal, it has been designed and built with a view to obtaining great strength and large wearing surfaces. The top plate of the cutter-head is held by means of case-hardened studs and nuts, so that it can be quickly removed to obtain access to the sheaves located at each corner of the cutter-head. Each sheave is provided with a special oiling device, so that a large quantity of oil can be poured into it at one time, and a reservoir is provided for keeping up a constant feed of oil to the moving parts. The shape of this cutter frame is triangular, making it necessary to use only three wheels, two in the cutter-head and the sprocket wheel for conveying power to the cutter-chain. The center rail is secured by means of a steel step-casting to the sliding carriage of the machine. On the carriage is mounted the driving and feeding mechanism, which consists of two steel pinions and two steel gears for driving the chain, all machine cut and of the very best grade of cast steel. The feeding mechanism is the same in principle as on the well-known Jeffrey cutter-bar machines.

In addition to the low machine are special truck attachments which save time in loading and unloading, and can easily be handled by two men, the machine runner and machine helper. It is calculated to cut about 100 lineal feet per shift in a 30-in. seam of coal. This record has been made and exceeded at the mines just referred to. As the coal in low seams is usually of excellent quality, it is a matter of great importance to have a machine which will operate successfully in them; the cost of production being lower allows the coal to be placed on the market at a price which will compete favorably with products from larger veins.

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.

WEEK ENDING DECEMBER 1ST, 1896.

- 572,101. COMPOSITION OF MATERIAL FOR INCANDESCENT GAS-LIGHTS. Ludwir K. B&hd, New York, N. Y. Assignor to the American Incandescent Light Company, of West Virginia. A composition consisting of magnesium oxide porcelain body, powdered asbestos, sulphate of chromium, oxide of calcium, sulphate of barium or minium, and thorium and zirconia.
- 572,113. ACETYLENE GAS GENERATOR. William P. Hill and Henry D. Hill, St. Louis, Mo. The combination of a water reservoir and a vertically reciprocating gas holder, whose lower end is within the reservoir; a support within and moving with the gas holder for a solid substance, which when moistened generates gas; a support in the gas holder above the support first mentioned upholding a gas-drying substance; the upper support being above the normal level of the water in the reservoir at all times and the upper surface of the lower support being beneath the normal surface of the water, when the gas holder is in its lowest position and above it when the gas holder is in its highest position.
- 572,162. MAGNETIC SEPARATOR. Joseph B. Hamilton, Springfield, Mass. The combination with an electro-magnetic roll or cylinder, of a wiper adapted to be held in contact with the roll or cylinder by magnetic attraction, and means for imparting movement to the wiper longitudinally of the roll or cylinder.
- 572,175. FEED-TABLE FOR ROLLING MILLS. William H. McFadden, Allegheny, Pa. The combination of two series of feed rollers, the rollers of one series being arranged to press the sheet against the rollers of the other series and means for positively driving the rollers of one series.
- 572,184. GAS PRODUCER. James D. Swindell, Pittsburg, Pa. The combination with a body portion for the reception of coal, of a basket grate and a projection having steep sloping sides and a sharp-pointed apex, the apex thereof reaching across the center of the grate from side to side thereof and serving to divide the falling ashes and cause them to descend in two directions as they drop from the grate.
- 572,200. SOLDER FOR SOLDERING ALUMINUM. Grant Hammond, Mulberry, Cal. A solder consisting of an alloy of tin 30 parts, aluminum 4 parts, and zinc 3 parts.
- 572,312. ELECTRIC FURNACE. Edgar F. Price, Newark, N. J. The combination of a conducting-hearth forming one electrode, a range of electrodes substantially perpendicular to the hearth and means for adjusting the electrodes and regulating the currents, a supply-hopper for the material to pass down around the electrodes, and means for varying the inclination of the hearth and the movement of the material thereon.
- 572,314. AIR-COMPRESSOR. Thomas H. Roberts, Detroit, Mich. The combination with a piston and piston-rod, of a cylinder in which the piston is adapted

to reciprocate, comprising two like sections secured together, with an apertured ring between their adjacent ends, each section having a chest at its outer end through which the piston-rod passes and outwardly opening disk valves in the chests sleeved upon the piston-rod and adapted to seat on the ends of the cylinder.

- 572,342. PROCESS OF REFINING COPPER SILVER BULLION. Frederick Gutzkow, San Francisco, Cal. The process consists of the following successive operations to wit: heating and dissolving the bullion in strong sulphuric acid, and during this operation progressively adding diluted sulphuric acid, separating the resulting copper sulphate by boiling to high concentration, separating the silver solution from the precipitated copper sulphate, diluting it with water and cooling, thus precipitating the silver as silver sulphate and leaving diluted acid, washing the precipitated copper sulphate with strong sulphuric acid to remove any adhering silver sulphate and reutilizing the diluted and strong acid thus obtained.
- 572,353. AMALGAMATOR. Wilfred L. Brown and Calvin Brown, San Francisco, Cal. Assignors, by direct and mesne assignments, of one-half to Leon St. D. Roylance and Charles A. W. Wagner, same place. The combination of a tank or receptacle having curved sides and amalgamating-plates fitted thereto, a pipe extending along the bottom between the sides with openings so disposed as to direct a fluid discharge therefrom against the concave surface of the amalgamating-plates, and an exhausting and discharging device having its discharge connected with the pipe and its exhaust connected with the interior of the tank near the top below the surface of its contents, whereby a continuous circulation is maintained.
- 572,369. MAGNETIC ORE-SEPARATOR. Charles J. Reed, Orange, N. J. An ore-separator having one or more magnets arranged inside of a hollow cylinder or chamber, in combination with a second surrounding hollow cylinder or chamber through which the ore is advanced longitudinally in one direction, while the tailings are discharged in another direction.
- 572,370. MECHANISM FOR SEPARATING MAGNETIC FROM NON-MAGNETIC SUBSTANCES. Charles J. Reed, Orange, N. J. A hollow revolving drum in combination with fixed or stationary external magnets and means consisting of a tube and a feed-regulating device for regulating the flow of the material into the interior of the drum.

Great Britain.

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

WEEK ENDING OCTOBER 31ST, 1896.

- 12,946 of 1895. Charles Raleigh, Johannesburg, S. A. R. Various detailed improvements in stamp batteries.
- 22,732 of 1895. C. A. Burghardt and G. Rigg, Manchester. Improvements in the extraction of zinc and copper from zinc-copper ores.
- 23,125 of 1895. J. A. Dickinson, London. In ore crushers, making the crushing faces of special steels.
- 23,543 of 1895. T. Parker and J. Pullman, Wolverhampton. Process for treating sulphide ores containing zinc.

PERSONAL.

MR. THOMAS W. GOAD has been elected managing director of the Gold and Silver Extraction Company of America.

MR. HORACE F. BROWN, of Chicago, has gone to Congress, Ariz., where he will complete and put in operation the new Planet-Saturn mill.

LIEUTENANT COMMANDER W. I. MOORE has been detached from the naval station at Newport, R. I., and ordered as inspector of ordnance at South Bethlehem, Pa.

LIEUTENANT C. M. FAHS has been detached from duty at Newport News, Va., and ordered to Pittsburgh as inspector of steel for the battleships Kearsarge and Kentucky.

MR. J. PARKE CHANNING, mining engineer, is now engaged in examining some mining properties in South Dakota. His address until December 15th will be Deadwood, S. Dak.

CAPTAIN FRANK HOBBS, of the Ordnance Department, U. S. A., has been ordered to South Bethlehem, Pa., in connection with the manufacture of a five-inch breechloading rifle.

MR. R. A. F. PENROSE, JR., mining expert and professor of economic geology at the University of Chicago, has returned from Arizona, where he went to examine mining properties.

MR. HENRY HILL, SR., who has held the position of outside foreman at Coxie Bros. & Company's colliery at Eckley, Luzerne County, Pa., for the past thirty years, has resigned on account of advanced age.

MR. F. ROESER, who has been with the Omaha & Grant smelter as chemist, has resigned his position and left for South Africa. Mr. Roeser has accepted a position with an English company operating in the Transvaal.

MR. J. R. GILBERT, for the past two years superintendent of the Merced Gold Mining Company's property at Coulterville, Cal., has been promoted to the position of manager, vice Captain THOMAS COUCH, resigned.

MR. J. D. KENDALL, of the firm of Burke, Moreing & Company, mining engineers, of London, Eng., recently arrived in Nelson, B. C. He expects to spend some time in the mining districts of British Columbia seeking interests for his firm.

MR. FREDERICK S. HARRIS, mining engineer, connected with MR. GEORGE H. ELLIS, chemist and assayer, of Metropolitan Block, Chicago, Ill., has gone to Union de Tula, Jalisco, Mexico, where he will superintend a large gold and silver mining property for Boston capitalists.

MR. C. S. BATTLEMAN has been appointed Superintendent of the Boston & Montana Mining Company's mines in Butte, Mont. He was formerly with the Montana Ore Purchasing Company in Butte. MR. JOHN H. MILES, recently with the Butte & Boston Company, has been placed in charge of the Boston & Montana Company's Leonard mines, succeeding MR. JOSIAH GILBERT, who has gone to the Merced mine in California.

MR. EDMUND JUESSEN, mining engineer and general manager of the Idaho Mining Company of Elk City, Idaho, has gone to Portland, Ore., where he will make his winter headquarters. The Idaho Company's property is a placer proposition and had been worked by two companies before the Idaho Company took hold. Mr. Juessen has, through methods of working of his own, brought the property to a dividend paying basis in but two years' operation.

MR. JOS. G. ALLYN, mining engineer, connected with the firm of Mariner & Hoskins, Chicago, has returned from a trip of four weeks, during which he examined gold properties in McDuffie County, Georgia, and Guilford County, North Carolina. He examined the old Columbia mining property in McDuffie County, Georgia, for Chicago capital, but his report was adverse to the exploitation of it. Mr. Allyn leaves in a week for Utah and Idaho, where he will examine gold properties.

MR. CHARLES BUTTERS, the eminent mining engineer, who has been for some years past in South Africa, recently arrived in New York from London. He has been taking a rest in the last-named city from his labors in the Transvaal, and from the hardships which he underwent as a prisoner at the time of the political troubles in that country. Mr. Butters makes but a short stay in New York and will in a few days leave for Colorado, whence he will extend his trip to the Pacific Coast. Previous to the political troubles in the Transvaal he was prominently connected with the use of the cyanide process in the recovery of gold, and especially with the introduction of the electric method.

MR. ARTHUR S. DWIGHT, who has been for the past 11 years connected with the Colorado Smelting Company, Pueblo, Colo., has resigned his position as superintendent of that business, to accept the general superintendency of the smelting works of the Kansas City Smelting and Refining Company, at Leadville, Colo., El Paso, Tex., and Argentine, Kan. Mr. Dwight's headquarters will be at Kansas City. The news of his entrance upon a wider sphere of professional activity will be received with

satisfaction by his numerous friends and by the metallurgical profession generally, in which he has already achieved an eminent position and a high reputation. MR. KARL E. EILERS, late assistant superintendent, will succeed Mr. Dwight as superintendent of the Colorado Smelting Company.

OBITUARY.

GEORGE N. CURTIS, died suddenly on December 3d in Paris. He was interested in the Standard Oil Company, several gas companies, and in street-car lines in New York, Philadelphia and Brooklyn. He was a member of the Union League and Metropolitan clubs.

ARTHUR BAYLEY, who discovered the Coolgardie gold field, in Western Australia, and whose extraordinary find in the Bayley's Reward claim created so much excitement, died November 1st, at his residence in Seymour, Victoria, as we have just learned from the *Australian Mining Standard*. His death seems to have attracted little notice, as he had for some time past been living very quietly on the Avenel estate, a property which he had bought near Seymour. Mr. Bayley was only 31 years old and was an Australian by birth, having been born at Newbridge, in Queensland. When 16 years old, he left home to work in the Queensland mines and from that time on was employed in mining and prospecting in various parts of Australia. He went to Western Australia to prospect, and there, in company with W. Ford, located Bayley's Reward, the first mine in Coolgardie. He also discovered the Murchison field, and in both cases opened the way for a rush of prospectors.

JOHN TOD, the head of the firm of Tod, Stambaugh & Company, of Cleveland, dropped dead at the Chittenden House, Columbus, O., on December 3d. Death was caused by a stroke of apoplexy. He was born on the Western Reserve 92 years ago. His connection with the business interests of Cleveland began about 40 years ago. The original firm of Tod, Rhodes & Company, was succeeded by Tod & Morris, later by Tod, Morris & Company, and in 1883 John Tod formed a partnership with John Stambaugh and Robert McCurdy, of Youngstown, under the name of Tod, Stambaugh & Company. The firm originally handled only coal, the members being individually interested in properties in the Mahoning Valley and near Akron, O., and in the Youghiohony Valley. In later years Mr. Tod's chief coal interest was in the Port Royal Coal and Coke Company. Iron ore and pig iron connections were also formed by the firm. A specialty was made at first of non-Bessemer, the Florence, Iron River, Corbett and Youngstown ores being handled. Brier Hill, Scotch, Arnold-Tod and Douglas pig irons were also sold, the members of the firm having an interest in the Brier Hill Iron and Coal Company, of Youngstown, O. Tod, Stambaugh & Company were among the first iron-ore selling firms to become identified with mining properties in the Mesabi Range, the sales agency for the Biwabik being taken at the start. The firm also handles the product of the Adams and Ohio mines on the Mesabi, and of the Shores mine on the Gogebic.

SOCIETIES AND TECHNICAL SCHOOLS.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—The annual meeting for the election of the Council for 1897, and the transaction of other business, will be held in the society's rooms, 112 Mansfield street, Montreal, on Tuesday, January 12th next, at 10 a. m.

MICHIGAN MINING SCHOOL.—At a meeting of the Board of Control recently held, the title of the executive officer of the school, M. E. Wadsworth, Ph. D., was changed from director to president. The department of mineralogy has lately added a fine collection of minerals to its equipment.

ENGINEERS' CLUB OF ST. LOUIS.—The 44th meeting was held December 21 at 1600 Lucas Place. Mainly routine business was transacted, consisting of the reading of annual reports of officers and reports of standing committees. Officers were nominated to serve the club during the coming year. Prof. J. B. Johnson showed the club a large number of lantern slides which had been prepared originally to accompany his paper recently read before the St. Louis Railway Club on "The Mechanical Properties of Wrought Iron and Steel, as Shown by Actual Tests."

INDUSTRIAL NOTES.

The Terrace City Brass and Iron Foundry, at Yonkers, N. Y., has been purchased by Allen & Irwine, who will conduct the business on an enlarged scale in the future.

The Boyce machine shops and enameling works of East Liverpool, O., manufacturers of potters' machinery, made an assignment Dec. 5 to W. L. Smith. Liabilities are \$24,000; assets, \$28,000.

Coffrode & Saylor's bridge works at Pottstown, Pa., have been levied on by the sheriff to satisfy a judgment of \$140,000. Execution was issued by the Pottstown Security Company for the judgment of creditors.

The plant of the Laidlaw-Dunn-Gordon Company, at Tweedvale, Pa., is to be enlarged by important

additions which include a brass foundry and a large fireproof pattern storage warehouse. The new foundry will be 113 ft. in width and 300 ft. long.

The Lalace-Grosjean Tin Plate Works, at Harrisburg, Pa., have been compelled to shut down because of a strike of the rollers. One of their number was discharged and the others quit. The owners threaten to close the works for an indefinite time.

The Rogers Locomotive Company at Paterson, N. J., has received an order from Japan for the construction of 18 locomotives to be of the mogul pattern. This order, together with the work already in progress, will keep the works busy for three months.

Big Aetna furnace, at Ironton, O., which is now being reconstructed, is stocking up on Lake Superior iron ore. It will go into blast in a short time. Big Aetna is one of the largest iron furnaces in the country, but has not been operated for a number of years.

The Consolidated Steel and Wire Company's wire mill, at Beaver Falls, Pa., started on double turn recently, and the nail mill of the same company, that has been idle since last July, started up on double time on December 7th. These two establishments employ about 500 hands.

The American Engine Company, of Bound Brook, N. J., during the month of November, 1896, shipped a number of motors, ranging from 5 to 25 H. P., several dynamos of 18 to 75 kw., and two engines, 8 x 8 in. and 14 x 12 in. in size, to printing establishments in various cities. A notable shipment was an engine 10 x 10 in. size, and a boiler of 50 H. P. to the Chinese government.

The Secretary of War has awarded a contract to the Bethlehem (Pa.) Steel Company, for 10 sets of forgings for 5-in. siege guns at 27½c. per lb. and for 10 sets of forgings for 7-in. howitzers at the same rate. He also awarded a contract to the Midvale Steel Company, for 20 sets of forgings for 7-in. mortars at 31c. per lb. and for 30 sets of forgings for 32-in. field guns at 32c. per lb.

The Lorain Foundry Company, of Lorain, O., will begin active operations January 1st, 1897, manufacturing a general line of iron, copper and brass castings. Special attention will be given to the manufacture of sand and chilled rolls, ingot molds and heavy castings up to 75,000 lbs. in weight. This company recently completed its foundry, which is thoroughly modern in all details of design and equipment. This industry is centrally located, and has freight facilities by both rail and water.

The New York Belting and Packing Company Limited, will, under its own name and management, on December 15th or thereabouts, open a large store or warehouse in Chicago. It has leased the five-story building Nos. 143-145 Lake street and will carry a complete stock of rubber goods and mill supplies. It is the intention to make this store the point from which the company's goods will be distributed throughout the West and Northwest. For 50 years the company has been making high-grade goods that have become standards in their respective lines.

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.

OIL PRODUCTION AND NEW WELLS.—According to the monthly statement of the Oil City Derrick, for November, 1896, the number of new wells completed in the New York, Pennsylvania and West Virginia oil fields amounts to 622, having a daily production of 9,702 bbls., and there are 984 new wells drilling. In the Buckeye field 299 new wells were completed during the month, having a daily output of 5,630 bbls., and 381 wells were under the drill at the end of the month. The southeastern Ohio district shows the completion of 60 new wells, with a daily production of 592 bbls., and 62 wells were at work on November 30th. The new wells completed in the Indiana field were 66, having a daily output of 1,400 bbls.; the number of wells drilling at the end of the month was 85.

ALASKA.

It is reported that the three lode claims known as Seek no further, Old Cattaraugus and Merrimac, owned by Phil Starr, Martin Sabin and Marion Thomas, have been bonded for \$45,000 to Chicago parties. These claims adjoin the Bald Eagle at Sum Dum and are probably on the same ore vein.

ALASKA TREADWELL GOLD MINING COMPANY.—This company reports the clean-up for the month of November as follows: Period since last return, 31 days; bullion shipment, \$56,751; ore milled, 21,187

tons; sulphurets treated, 419 tons; of bullion there came from sulphurets, \$21,268. The average yield was \$2.68 per ton of ore milled.

ARIZONA.

YAVAPAI COUNTY.

MAMMOTH & EUGENE.—S. J. Fleming, of the Providence Mining Company, has bonded these mines in the Big Bug District, the property of W. N. Kelly and Michael Wormser, respectively. Mr. Fleming proposes to drive a tunnel about 1,000 ft. long and have about 600 ft. of backing, under Belcher Mountain, on the Mammoth claim. The vein averages about 9 ft. in width, all quartz. The mill will be erected immediately.

PLANET-SATURN GOLD MINING COMPANY.—This company's new mill is of the Brown automatic type, and is the first complete automatic mill in the West. The crushing is by Cornish rolls, reducing the ores to a 16-mesh size. This pulp is roasted, cooled and conveyed in Brown's combined roasting, cooling and conveying furnace, and charged to the cyanide tanks by Brown's automatic pulp distributor, there being no manual labor required from the time the ore is charged to the crusher until the tailings are sluiced out of the tanks.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

AMELIA MINING COMPANY.—This company has been incorporated with a capital of \$2,000,000. Directors, T. P. Ross, J. H. Sievers, P. Beanston, J. L. Marshall, J. McKilvery, T. J. Fitzsimmons and W. R. Boone. Their property is known as the Hoffman Field, which is located in the town of Jackson, between the Argonaut and the Alma mines. Arrangements are being made to develop the property by running a drift from the Alma shaft, which is 600 ft. from the south line of the Hoffman Field claim.

BAY STATE.—This mine, four miles north of Plymouth, is looking well. They are drifting and stopping on the 300-ft. level and the 10-stamp mill is running on good ore.

GOOD HOPE.—At this mine, near Jackson, 5 stamps were started up a few days ago. The dump pile, which has been lying idle for 20 years, is being passed through the mill. They expect to realize between \$2 and \$3 per ton. No concentrates are being saved at present.

POCAHONTAS.—At this mine, in the Drytown District, the shaft is down 90 ft. Several ledges have been struck in the crosscut, the last one being 23 ft. in width, the ore looking well.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

MILTON CONSOLIDATED.—This mine is located 4 miles south of Angels Camp. A tunnel is being run from Carson Creek, which will be 700 ft. long, giving 700 ft. of backs. The shaft on the vein is down 60 ft. The Carson Creek mine on the south has a 47-ft. vein of good ore.

KERN COUNTY.

(From Our Special Correspondent.)

BLACK HAWK.—This mine is situated two and three-quarter miles from Randsburg. One shaft is down 100 ft., and two drifts of 45 and 50 ft. on the first level; another shaft is down on a 10-inch vein of good ore.

BUTTE COMPANY.—This company is working 30 men on 8-hour shifts. The shaft is down 110 ft. Drifts are run east and west and some good ore is being taken out.

RAND GROUP.—The only work being done on this property is on the Olympus and Yellow Aster claims. The Olympus has a well-developed ledge 9 ft. wide. A drift has been run 300 ft., and they are now running a crosscut from the end of the drift to the hanging wall to begin stopping. About 15 tons of ore are being taken out daily, that averages about \$30. The Yellow Aster has a tunnel in 310 ft. Near the mouth of the tunnel they are sinking a shaft. Five tons of rock which have been milled averaged \$25 per ton.

LAKE COUNTY.

(From Our Special Correspondent.)

MIRABEL.—The owners of this old quicksilver mine, about 13 miles north of Calistoga, are again in trouble. This property is held under an agricultural patent and was sold at one time for \$750,000. A suit was filed a few days ago at Lake Port by the Standard Quicksilver Company through A. H. Ricketts, of San Francisco, which asks for an injunction to put an end to trespass on the mine. Among the defendants are John R. Dewar, of Oakland; Grant Reed, of San Francisco; ex-Judge Hudson, of Lake Port; Mrs. Annie Habshaw, who lives near Calistoga, and B. F. Staley. They located a mining claim overlapping the agriculture patent, and last month made a very rich strike of cinnabar. The situation was complicated, as the Standard Company and the defendants came together in their workings. The company was running a tunnel, when the other party, in sinking a shaft, broke through, throwing great quantities of rock into the Standard's level, and preventing the further development of the strike, which had been made almost simultaneously by both parties. A temporary injunction was issued, and the interesting case, involving the conflicting claims of an agriculture patent and a mineral location, will come up for trial early in January.

MARIPOSA COUNTY.

SOUTH EUREKA.—The shaft in this mine is being sunk from 1,300 to 1,400 ft., and a 20-stamp mill is running on good rock.

UNION CONSOLIDATED MINING COMPANY.—A 20-stamp mill is being run on this company's property, and a new 30-stamp mill will be started up in a few days. The rock is up to expectations. The shaft is to be sunk from the 450 to the 1,000-ft. level.

NEVADA COUNTY.

BRUNSWICK CONSOLIDATED GOLD MINING COMPANY.—Mr. J. J. Halpin, manager of this company, immediately after his arrival from New York telegraphed to the office in that city as follows: "Have struck large body of very rich ore, 900-ft. level, showing gold."

SOUTH IDAHO MINING COMPANY.—The annual meeting of this company was held recently at Grass Valley. The following directors were elected: James McKenna, W. J. Rogers, Jos. O'Keefe, W. H. Crase and J. H. Smitham. The Board of Directors organized by electing James McKenna president and W. J. Rogers secretary.

(From Our Special Correspondent.)

PENNSYLVANIA.—The ore in this mine, one and a half miles from Grass Valley, is improving. The last clean-up for a 10-days' run was \$12,000.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

BLACK BEAR.—Two ledges, one 3 ft. and the other 7 ft. wide, have been discovered in the lower tunnels of this mine. The ore is fair grade. This mine contains six claims, and is located 7 miles south from Sawyer's Bar.

COLORADO.

BOULDER COUNTY.

COMSTOCK-SULLIVAN.—Development work on this property, at Quigleyville, is being pushed, three shifts of men being employed. The shaft has reached the 300-ft. mark, in which an 18-in. streak of good ore has lately been encountered.

DELANO MINING AND MILLING COMPANY.—This company, whose main stockholders live in Hartford, Conn., has purchased of John Brierly 3.9 acres of ground near the mouth of Boulder Canon for \$3,900. A contract for the erection of a 50-ton chlorination plant has been let to the Stearns Rogers Manufacturing Company of Denver, at a cost exceeding \$50,000. Excavating for the plant has been begun. The main building will be 55 x 183 ft., exclusive of boiler and engine-room and offices. The company owns a group of mines at Magnolia, and will treat the ore from them. If their output should not equal the capacity of the plant, ore will be purchased from other mines.

MORNING STAR.—The force on this mine, at Ward, has been increased by an additional shift, making three eight-hour shifts working. The total number employed underground at present is 66. Several tons of ore are being hoisted daily.

CHAFFEE COUNTY.

YANKEE BLADE.—Work on this property, near Granite, is under the management of Clarence Richardson. The water in the old shaft has been reduced from 60 ft. from the top of the shaft to 150 ft. The working shaft—45 ft. lower on the hill than the old one—has reached a depth of 102 ft. At 95 ft. a drift was turned to the west. This drift is now in about 35 ft. There is about 3 ft. of ore in the breast of the drift. Fourteen in. of this (three streaks) is first-class ore, and the balance is a fair grade of mill dirt. The new shaft and engine-houses have been completed, and the shaft has been retimbered to the bottom. Twelve men are employed at present.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

ALBRO.—Some new bodies of ore have been opened in the levels being driven from the shaft in this mine, near Idaho Springs, and at 700 ft. the streak is from 10 in. to 15 in. wide, all smelting and netting \$50 a ton.

ALIUNDE.—This company is attempting to open up richer bodies of ore in its mines at Georgetown and while there are large bodies of low-grade ore in the Colorado Central, they are driving the drifts ahead. It is claimed the grade is much better in the various headings.

DORIC GOLD MINES, LIMITED.—A correspondent of the Rocky Mountain News says that W. E. Swanton, managing director of these mines, who returned from England recently, will probably remain until next spring. Mr. Swanton, as well as Mr. Lewis, of the Doric mines, represents a very wealthy syndicate of Englishmen, who are ready to put money into mining propositions that meet their approval, not as a speculation, but as a proposition that promises fair returns for the investment. Mr. Swanton has examined properties at Cripple Creek and other points, but prefers to invest in Clear Creek County.

GENERAL THOMAS.—At a depth of 300 ft. in the shaft of this mine, at Idaho Springs, an ore body was cut by drifting through a porphyry dike which in itself carries values sufficiently high to be sent to a stamp mill for treatment. The mineral streak is about 20 in. wide, 6 in. of ore running \$150 per ton and 14 in. \$60 per ton. The porphyry dike is 4 ft. wide and nets from \$8 to \$10 per ton. It is filled with seams, and it appears to me that these carry values.

GOLCONDA.—A plant of machinery has been installed on this property at Idaho Springs, and the 15,000 ft. crosscut tunnel to reach the lode will be driven with air drills.

GOLD MEDAL.—Considerable excitement has been raised at Idaho Springs over the opening out of 92 oz. gold ore in this claim. The streak is but 2 in. wide; another streak next to it 6 in. wide runs 3 1/2 oz. gold, and 3 ft. of mill dirt nets from \$8 to \$10 per ton. The claim is of a group owned by Boston people.

GRIFFITH.—All of the claims on this mountain have been consolidated in one group by Hood & Fletcher, of Georgetown. A big hoisting plant has been installed and the various claims will be worked through one shaft. At the same time an adit is to be commenced far down the hill to reach the shaft at a depth of probably 800 ft.

MENDOTA.—The Victoria tunnel at Silver Plume is again being driven ahead, after a cessation of work for several months to allow drifting with air drills on a cross lode.

SUN & MOON.—While this is without doubt an exceptionally good property, the owners sent a man from Cleveland to manage it, who knew absolutely nothing about mining. As a result the mineral was gophered until the owners became aware of the fact and on December 1st placed an old-time miner in charge of the work, giving him full authority to work the mine in mine fashion. The shaft will probably be sunk to 1,800 ft. to form a connection with the Newhouse tunnel, which will cut the lode early in the year.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

BLUE BIRD.—This property, on Bull Hill, has been leased and bonded to Mr. J. H. Mason, who has commenced to work on the old shaft, from which ore was mined in 1892 by Dr. Burdick and associates. The bonded price is \$250,000. The lessees on the north end of the claim are doing well.

BRODIE CYANIDE MILL.—For the month of November 1,702 tons of ore were treated, of a gross value of \$41,876. The average price per ton was \$24.60. The mill is now idle on account of improvements.

ELKTON.—This mine, on Raven Hill, made a wonderful record for November, 700 tons of a gross value of \$85,000, or an average of \$121 per ton, produced at a cost of \$12,000.

EL PASO REDUCTION WORKS.—These works, at Gillette, treated during November 1,300 tons of ore, which yielded 2 oz. of gold per ton. The amount treated has usually been 1,500 tons, but the ore was of a lower grade, about \$30 per ton. The aggregate value of the November output has been the largest in the history of the mill. The number of men now employed is 38.

FANNIE B.—Lessees on this fractional claim, on the northwest slope of Beacon Hill, have made a rich strike within the past three weeks. A small shipment of 44 lbs. sampled nearly \$9 a pound. All the adjoining claims are being eagerly sought after by lessees.

FREE COINAGE.—This property, on Bull Hill, has leased its Pinto and Rising Sun claims to Messrs. Reed, who have erected a plant of machinery, sunk a shaft 150 ft., extended levels both southeast and northwest to the 50-ft. and 100-ft. levels, exposed the Pharmacist vein at both levels and are stopping on it. The lessees employ 12 men.

GROUSE.—This mine, on Bull Hill, has a new shaft-house, sorting-house and engine-house. The shaft, as soon as timbered from surface to bottom, 185 ft., will be sunk deeper. The gross output is about \$4,000, and gives employment to 21 men.

HALLETT & HAMBURG.—Returns received from the 12 tons sent to the sampler from their Battle Mountain property gave \$32.40 per ton, without sorting. The vein is reported as being 3 ft. wide. The shipment was the first made from these four-fractions on the south slope of the Butte Mountain. The shaft is down 120 ft.

KATINKA.—This group of claims, on Ingot Hill, under lease and bond to Boston people, under the superintendence of Mr. De Vore, has been actively worked. The surface looks as if "nature suffered from smallpox," and the work is still prosecuted by 16 men. Two shafts have been sunk, but not much values have been found.

KING OF DIAMONDS.—On this property, north of Cripple Creek, a crosscut has been driven 32 ft. west of the 125 ft. shaft, which intersected a new vein over 6 ft. wide, with no west wall, assaying from \$8 to \$24 per ton. This is an entirely new vein from that which the owners have been at work on almost uninterruptedly since early in 1893, and from which several shipments were made. The vein is in a coarse-grained granite formation. The dike has disordered the main vein below the 80-ft. level. The ore is an ideal one for the cyanide process.

MOON ANCHOR.—This mine, on Gold Hill, has had its shaft sunk 50 ft. below the 400-ft. level. The output for November of both shipping and smelting ore was 496 tons, of a gross value of \$16,000. The mine employs 42 men.

OPHELIA TUNNEL.—This tunnel, which has pierced Gold Hill 2,600 ft., closed on the morning of December 2d, because, it is said, the owners of the claims refused to make contracts with the owners of the tunnel for the drainage and transportation of mineral. The flow of water is estimated at 2,100 gals. per minute.

ROSS-HURD TUNNEL.—This tunnel has been driven 710 ft. into Raven Hill from Arequa Gulch, but without meeting much value.

RUBIE.—This mine, on the south slope of Bull Hill, after being idle for several months, has been bonded and leased by Detroit parties. This property was leased and bonded by Judge Penderly to Colorado Springs parties for \$20,000, who paid for it out of the proceeds of the mine, but of late the yield has not been as previously.

SHERIFF.—This property, on Raven Hill, is being worked by four sets of lessees, only two of whom are shipping. Dr. Ramey, on the south end, has sunk three shafts, varying from 40 ft. to 110 ft. in depth, the vein, 4 ft. wide, assaying \$15 per ton. The lease on the north end averages a little over \$20 per ton from a shaft 40 ft. deep.

SPRING CREEK DEEP MINING AND DRAINAGE TUNNEL COMPANY.—This is the name of a new St. Louis corporation about to start work in the camp. The object of the company is to drive a tunnel from Spring Creek through Tenderfoot Hill in an easterly course. A contract has been let to drive a tunnel 7 ft. x 7 ft. in the clear 3,000 ft. St. Louis is supplying the money for the scheme.

SQUAW MOUNTAIN TUNNEL.—This tunnel is being driven by machine drill. A winze is being sunk and a drift developed from which ore is being taken. The tunnel gives employment to 15 men.

TRACHYTE.—This mine, on Bull Hill, is still being worked. A recent assay ran over \$400 to the ton. Heretofore but one shipment has been made from the property. The shaft has been sunk 225 ft. and drifts extended on the vein in two directions, 50 ft. each. Recently a crosscut was commenced to intersect another vein.

TRAIL.—Messrs. Cranmer Bros., lessees, commenced working at the mouth of a tunnel driven in 1892, and have discovered a new vein which shows free gold. This mine has not been a prolific shipper of late, although the developments have been kept well ahead.

FREMONT COUNTY.

ESPINOZA GOLD MINING AND MILLING COMPANY.—About 50 ft. of work has been done in the tunnel on the Sundown, near Espinoza Gulch. This is one of a group of 14 claims belonging to this company, and is a promising proposition. L. W. Harlow, David Brothers and C. F. Musgrove, of Denver, and John Musgrove, of Toronto, Canada, who control the greater amount of stock, were in camp two weeks ago and let a contract for 100 additional feet of work.

LAKE COUNTY.

(From Our Special Correspondent.)

DECEMBER PRODUCTION.—It is rather remarkable that in the face of a strike Leadville is steadily increasing its production. The output during this month will be in the neighborhood of 1,200 tons of ore a day; of course, a large part of this is iron ore. There being but one smelter here, the Arkansas Valley, that plant is enabled to keep going. In addition to this, considerable ore is being shipped to the smelters in Denver and Pueblo. The Arkansas Valley people are taking about 400 tons a day, while the valley smelters (railroad shipments) are handling from 700 to 800 tons daily. The present production of the camp is made up as follows, the figures given being tons: Marian, 100; Lower Henrietta, 15; Ibox Mining Company, 120; Resurrection Mining Company, 50; Sedalia, 30; Bison Mining Company, 50; Big Four Mining Company, 15; Morning and Evening Star, 150; Robert Lee, 25; Mahala Mining Company, 125; Catalpa Lease, 150; O. K. Lease, 50; Sulphide Mining Company, 50; Little Chief, 50; Denargo Lease, 40; Lillian, 40; Yankee Doodle, 40; Vinnie, 25; miscellaneous leases, 75; grand total, 1,200.

HERMANN SHAFT.—Sinking on the new shaft is being pushed ahead rapidly and it is now down over 500 ft. There is considerable water to handle, but the flow is being taken care of by a first-class pumping plant.

LEADVILLE BASIN.—The drainage of this basin is still an affair of the future. I learn, however, from very good authority, that all of the signatures to the iron-clad agreement, which has been drawn up relative to a division of the pumping expenses, have been secured excepting two or three, and that these will be forthcoming before December 10th. As I already stated, this agreement is for 8 years, and when the pumps once start up under it a vexed question will have been disposed of for some time to come.

MONARCH MINING COMPANY.—This company is developing the Virginus and Monarch shafts. The former is down 220 ft. and a short time ago drifting was commenced, which has resulted in opening up a good body of ore carrying a nice gold value. Arrangements are on foot to put a new plant of machinery in place and shipments are to be commenced at an early day.

WESTON PASS.—This section is now attracting considerable attention and next summer will witness a revival of active mining in that district, which is directly in the line of the Leadville gold belt. During the past season some very good gold finds were made and a number of good locations were made by new people.

OURAY COUNTY.

(From Our Special Correspondent.)

BACHELOR NO. 2.—Another strike has been made in this tunnel, which, as originally projected, was

intended to cut the main vein at a depth of 150 ft. and 200 ft. from its mouth. At 60 ft. from its adit a vein 4 ft. wide, of fine white quartz, highly mineralized, has been broken into. The quartz is impregnated with white and yellow iron galena, a large proportion of copper, and also carries gold in paying quantities. The owners of this property have also begun work on the Aladdin, and Manager Murphey expects to drive another tunnel shortly for the purpose of cutting the veins in both properties at a depth of about 700 ft. from the surface.

CHICAGO.—Large quantities of gold ore are being shipped.

CONGRESS.—Large quantities of ore are being shipped daily, and will continue while the roads are open.

GUSTON.—The Rainbow route is clearing its tracks of snow to the Guston and Robinson, for the purpose of putting in a large quantity of coal, which promises an early resumption of work on those properties.

JAPAN.—This mine, which recently closed down, will resume soon with a force of 100 men.

JAY BIRD.—Some fine ore was encountered last week, and indications are encouraging.

KHEDIVE.—Two carloads of ore have been shipped, one running \$72 per ton and the other \$123. The new ore-house and other improvements have all been completed, and a large force of miners is employed.

LODER PYRITIC REDUCTION COMPANY.—Owing to differences arising over the purchase price of the intended smelter site, this company has moved its location down the valley nearly a mile, having secured a plot of ground at the Bachelor switch. The Rio Grande Railroad Company has agreed to enlarge and extend its yards at that place, and a force of men has been put to work on it.

NATIONAL BELLE.—This mine is shipping an average of 5 cars daily of very good ore, which will be continued until snow stops transportation over the Rainbow route.

O. & N. TUNNEL.—This property shipped its third carload of gold ore recently. The O. & N. is working a large pocket of ore at the dividing line of the O. & N. and American Nettle.

SILVER BELL.—Horn & Alley are working a small force on good ore.

TOM BOY.—The expert examination of this property, in Marshall Basin, has just been completed, and the report, upon which depends a sale of \$2,000,000, submitted to the company. The report is said to be favorable.

WEDGE.—Messrs. Farrish & Richards have taken up the bond on this property and paid the former owners \$40,000, in full. The Wedge is regularly shipping high grade ore.

FLORIDA.

POLK COUNTY.

LAND PEBBLE PHOSPHATE COMPANY.—This company, of Bartow, has started up its works, which have been closed for some weeks, and will run on full time.

IDAHO.

ADA COUNTY.

CHECKMATE.—A new strike is reported in this mine at Willow Creek, which is owned by Salt Lake and Ogden (Utah) men. Sinking was stopped some time ago owing to the flow of water. Pending the erection of the necessary plant for handling the water, drifts have been extended both ways on the vein. These have opened into better ore than any previously developed.

BLAINE COUNTY.

VANDERBILT MINING COMPANY.—A rich strike is reported to have been made recently in this mine, situated about three miles from Hailey. It is being worked at present by a force of 18 men, all of whom will put in full time during the winter months. Isaac Jennings has been appointed manager at the mine.

IDAHO COUNTY.

IDAHO GOLD AND SILVER MINING COMPANY.—A deal was closed recently whereby Samuel L. Silverton, of Butte, Mont., became the owner of some of this company's property situated in the Elk City district. The purchase price is said to be \$4,000.

TRILBY MINING COMPANY.—This company was incorporated recently for the purpose of working and operating mines in the Florence mining district and buying and selling mines in the State. The principal place of business is Kendrick, in Latah County. The capital stock is \$300,000, divided into shares of the par value of \$1 each. The trustees are John H. Hutchinson, S. D. McCrea, E. M. Barker, Mathias Jacobs and J. D. Mingham.

SHOSHONE COUNTY.

EXPLORATION COMPANY, LIMITED.—It is reported that the proposed sale of the Helena and Frisco silver-lead mine, in the Coeur d'Alene District, to this British company has been closed. The mine was owned by Helena, Mont., men, and has paid \$475,000 in dividends. Mr. Hamilton Smith, of London, has just returned from an examination of the mine for the foreigners, and on his report the sale was made. The price stated is \$2,250,000. The purchasers are the men who have bought the Anaconda, and are negotiating for the Homestake in South Dakota and leading properties in Arizona and California.

KANSAS.

At a conference of Omaha, St. Joseph and Kansas City packers it has been determined to form a company and purchase salt mines in the State of Kansas, and hereafter produce all the rock salt that may be needed in the packing business of the three cities. The main office of the concern is to be in Kansas City, Mo., and the product is to be distributed from this point.

MICHIGAN.

COPPER.

CENTRAL MINING COMPANY.—This company's workings are improving, and the output in November was 41 tons of copper, the largest reported for a long time.

TAMARACK MINING COMPANY.—This company has declared a dividend of \$3 per share, payable at the office in Boston, December 31st, to stockholders of record on December 8th. This dividend will make a total of \$6 per share paid this year, against \$8 last year, \$8 in 1894, and \$12 in 1893.

MINNESOTA.

(From Our Special Correspondent.)

Total shipments of iron ore from all lake ports but Escanaba are as follows, Marquette and Duluth having sent out their final cargoes Monday of this week: Duluth, 1,998,900 tons; Marquette, 1,421,551; Two Harbors, 1,813,900; Ashland, 1,566,337; Superior, 168,000; Gladstone, 220,800. Escanaba has probably shipped a little over 2,000,000 tons. The utmost difficulty has been experienced of late in loading vessels, the ore first freezing in the cars, then in the docks, and being extremely hard to get into vessels.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

CINCINNATI ORE COMPANY.—This company will employ 150 men all winter, arrangements having been made to that end.

FAYAL IRON MINE.—This Minnesota Iron Company's property is employing less than 400 men and is hoisting 1,500 tons of ore daily, as good work as has ever been done in an underground mine of this range, when its age is considered.

FRANKLIN MINING COMPANY.—Very important work is going on at this group, on surface and underground, preparing for a large output for the winter. The mines will be running at full pace about January 1st.

HIBBING TOWNSITE.—At No. 3 hole on this property, on the east side of the village, ore has been sunk into 195 ft., and there is no indication of a bottom. Appearances indicate that here will be found one of the richest mines of the Mesabi, with ore of a very high grade.

MAHONING ORE COMPANY.—At this mine the 200 men employed in stripping under the Winston contacts have been laid off, frost interfering with the work, which is in an advanced stage. The mine will be idle till spring.

ROUCHELEAU IRON COMPANY.—This company is preparing to open a mine, near Biwabik, and will probably do so at once. It will employ about 150 men during the winter.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The weather last week was fine, and several new mines commenced producing ore and increased the total output of both lead and zinc. The shipment of zinc ore was an increase of two carloads over the preceding week and 35 more than the corresponding period last year. The lead sales increased three carloads over the preceding week, amounting to about the same as in 1895. Six carloads of Joplin ore and one from Webb City brought \$26 per ton, and prices ranged from that figure down, about one-third of the shipment selling at \$25 or better. The corresponding week last year zinc ore sold at \$22 per ton. Lead ore began at \$15.50 per thousand pounds delivered, advancing Thursday to \$16.50. The corresponding period last year lead brought \$18 per thousand pounds delivered. Five carloads of lead were shipped to Colorado for fluxing refractory silver ores. The following was shipped from the different camps: Joplin zinc, 1,258,300 lbs.; lead, 204,360 lbs.; value, \$21,636. Webb City zinc, 497,870 lbs.; lead, 45,800 lbs.; value, \$6,333. Carterville zinc, 1,008,800 lbs.; lead, 139,570 lbs.; value, \$15,528. Galena, Kan., zinc, 2,740,000 lbs.; lead, 418,000 lbs.; value, \$36,828. Aurora zinc, 495,000 lbs.; lead, 31,900 lbs.; value, \$4,136. Oronogo zinc, 84,670 lbs.; lead, 26,930 lbs.; value, \$1,338. Alba zinc, 89,000 lbs.; value, \$1,113. Stotts City zinc, 40,000 lbs.; value, \$501. District totals for last week: zinc, 6,207,320 lbs.; lead, 1,007,340 lbs.; value, \$87,413. District totals for 49 weeks in 1896: Zinc, 280,806,030 lbs.; lead, 50,692,420 lbs.; value, \$3,570,646.

BECKY SHARP MINING COMPANY.—This company has leased 40 acres of Snapp land and 40 acres of the Bray land, situated at Tuckahoe, 3½ miles northwest of Joplin. The lease is owned by Hon. F. W. Mott, of St. Louis, and A. J. Donnan, of Joplin. The latter gives the lease his personal attention. Good faces of ore have been developed from 50 ft. to 160 ft. The Manson Bros. have a face at 115 ft. that is rich in pebble jack, 100 tubs washing out four tons of zinc ore. The Minnie A. mine is opening up a fine face of dirt that will produce from 15 to 20 tons of zinc ore, if run steadily.

BOYD & COMPANY.—At their mine on the Grauley land in Leadville Hollow they are drifting at 85 ft. on a good run of lead in hard ground with zinc ore under the lead and have been turning in 15,000 lbs. of lead a week.

DUFFLEMEYER & COMPANY.—They have a lease on three lots on Fourteenth street, owned by R. B. Cholmondeley, and are drifting at 92 ft. on a good face of lead and zinc ore. One 8-in. lift pump is kept busy draining the ground. A steam hoister and hand jigs are used to handle the dirt and they produce each week 10 to 12 tons of zinc ore and about 8,000 lbs. of lead.

HORSE SHOE MINING COMPANY.—A new 50-H. P. boiler is being bricked in at the company's mine on the Joplin Prospecting Company's lease of the John H. Taylor land. A steam hoister is in place and a 10-in. steam lift pump is on the ground. The shaft shows ore at three levels and the lower one has not been penetrated.

JOPLIN CITY MINING COMPANY.—This company has leased 40 acres adjoining the Bankers Land & Mining Company's 700 acres. The 40 acres belong to E. O'Keefe, of Carthage, and have been mined before enough to develop several levels from 35 ft. to 165 ft. Machinery has been put up to operate the ground, comprising 2 boilers, one 60 and one 40-H. P.; three engines, one 15-H. P. to operate the concentrators; one 25-H. P. for the milling machinery, one 40-H. P. to operate the pumps. The company has been pumping for five months, and the ground is drained to 125 ft. and will drain it to 175 ft. They are ready to hoist dirt from the 120-ft. level, where there is a rich face of ore. Wickersham & Company are drifting at 60 ft. on a rich run of lead, and in one week made 32,250 lbs. of lead. Coyle & Company are drifting at 107 ft. on a good run of lead.

PURCELL & COMPANY.—They have a lease of 10 acres in Miller Hollow in Empire City and have transformed a group of abandoned mines into a busy mining camp. Several of the old shafts are again yielding ore in paying quantities, and 3 new shafts have developed a large face of ore. The ore is found from 60 ft. to 100 ft. deep in shooting ground.

RAGAN MINING COMPANY.—The new discoveries of ore on the Ragan land south of Webb City are creating a good deal of excitement in the camp. Long & Gorman made the first strike of importance and they are now cleaning 15 tons of zinc ore per week. They are drifting at 70 ft. Miller, King & Company have struck the same run of ore and last week cleaned up 5 tons of zinc ore and 1,700 lbs. of lead. Smith, Lively & Company are down 70 ft. and have opened up a fine face of zinc ore, while Bascom, Bell & Company are getting good slimes at 30 ft. Callaway, Easley & Company are drifting at 70 ft. north of the old pump shaft in good pay dirt, and Atter & Rogers have a body of zinc ore in soapstone ground on the branch. John Raymond has leased the company's crusher and rolls and will soon be prepared to do custom work. On the south side Cowan & Company are sinking in good lead slimes at 50 ft. and Carrick & Company are taking out pay lead dirt at 90 ft. in open ground from an old shaft that they sank deeper.

ROBINSON & CO.—On the Button Hole lease this company has struck the ore body at 83 ft.

R. T. CLAGG.—Mr. Clagg, of Lancashire, England, who recently purchased an interest in Mrs. Thos. Wells' mine on the Perry lease at Cartersville, opened up a large face of zinc ore while drifting at 190 ft. Mr. Clagg is the manager of the mine. He also owns a fourth interest in five lots of the Mole Mining Company on the Mahaska lease, near Joplin.

SHIRLAND LEAD AND ZINC COMPANY.—This company is situated on the Jackson land and is sinking to take up a 10-ft. stope. In drifting 20 ft. from the shaft at 90 ft. they struck the top of a body of good ore.

SOUTH JOPLIN LEAD AND ZINC COMPANY.—The company is running its steam concentrating plant steadily, is hoisting dirt from three shafts and drifting at 60 ft., 90 ft., and 110 ft. in soft timbering ground with strong water. They are making about 40 tons of high-grade zinc ore and 5,000 lbs. to 10,000 lbs. of lead a week.

T. J. STEERS & COMPANY.—This company has started its new steam jig plant on the Steer and Lear lease near Midway. They have developed a large face of zinc and lead ore at 120 ft. and last week made 25 tons of zinc ore.

TOP RUN COMPANY.—This company has sunk its shaft about 20 ft. deeper and has opened up a second run of ore. They are also drifting on the upper run and are making 15 tons of high-grade zinc ore a week.

UNION TRUST MINING COMPANY.—This company, mining on the Tailor addition in Leadville Hollow, is down 85 ft., and has had good lead slimes the last 10 ft. Recently they shot into a body of blue flint with veins of zinc running through it and small pockets of tiff and rosia jack.

MONTANA.

CASCADE COUNTY.

SAND COULEE COAL COMPANY.—It is stated that this company intends to open up mines owned by it near Armington. The company owns 1,000 acres of coal land on the west side of Belt Creek.

FERGUS COUNTY.

SPOTTED HORSE.—About 1,000 tons of ore has been taken out of this mine near Maiden by J. L. Bright

since assuming control of the property. He has 20 men at work prospecting and breaking new ground. It is intended to use both the stamps and the cyanide process in treating the ore.

GRANITE COUNTY.

GOLDEN SCEPTRE GOLD MINING COMPANY.—It will be some time before the difficulties of this company can be adjusted. There are now 78 liens filed against the company, aggregating \$100,000, the confessed judgments \$285,000, other attachments \$25,000, making a total of about \$410,000. It is said that when a receiver is appointed all indebtedness will be immediately liquidated and work resumed, but probably nothing will be accomplished before spring.

JEFFERSON COUNTY.

HOPE.—This mine, at Basin, recently resumed operations, the first mining that has been done in the property since the destruction of the shaft by fire last year. The mine is now owned by a Philadelphia syndicate, which proposes to work it on a large scale. Among the contemplated improvements in the mine is the sinking of the present shaft to the 1,500-ft. level. A large shaft-house has been erected over the shaft to accommodate a large engine now in course of construction in Wilkes-Barre, Pa.

MEAGHER COUNTY.

BROADWATER.—The owners of this mine, at Neihart, were successful recently in unearthing a body of high grade ore in a crosscut from tunnel No. 1. The ore is said to run very high in silver.

SANTA FE COPPER COMPANY.—It is estimated that there are 500,000 tons of ore in sight in the mines of this company at San Pedro, in the southern part of the county. These mines have not been in operation for about 3 years, and only 25 men are now engaged in development work. The smelter belonging to the company at San Pedro is idle, but it is reported that operations will be resumed in the near future in the mines and at the smelter. This will give employment to more than 500 men.

TREASURE MINING COMPANY.—This company is working a large force of men on the Atlantic mine. The main shaft is down 312 ft. At a depth of 186 ft. a drift was run 950 ft. south and a large amount of ore extracted. The mill is kept running steadily on the ore produced at the mine.

SILVER BOW COUNTY.

BUTTE & BOSTON MINING COMPANY.—In Butte, this week, United States Judge Knowles signed the final decree providing for sale of all the company's properties by the Receiver, the decree providing for the usual right of redemption. Capt. Thomas Couch's resignation as Receiver was accepted, leaving John Forbish sole Receiver. The reorganization committee was represented by Lewis Marshall, of New York, and Charles R. Leonard, of Butte. The sale includes the properties covered by the mortgage of the Massachusetts Loan and Trust Company and the other claims acquired since the mortgage was given, in all 57 claims.

(From Our Special Correspondent.)

We often hear of copper ore being discovered in various places in this State, and no doubt some of these discoveries will prove important producers in the future; but up to the present there is very little copper produced outside of Summit Valley mining district (Butte). At one time there were in operation in this district 270 stamps; now all are silent with the exception of the Alice 60-stamp mill. Although the low price of silver has rendered impossible the profitable working of an ordinary silver mine, the copper mines have increased their production year after year in such a manner, that the decrease in silver mining has hardly been realized by the community, and with a new smelter nearing completion for the Parrot Copper Mining Company, and another expected for the Washoe Copper Mining Company, under ordinary conditions next year's production will still show an increase.

MINNIE HEALY.—The lessees are putting in new boilers, engine, etc. The shaft is 400 ft. deep, and sinking will commence as soon as the machinery is ready to work. This mine is located close to the Colusa; it has been leased to different parties who have produced considerable high-grade copper ore.

MONTANA ORE PURCHASING COMPANY.—At the Rarus mine about 400 tons of ore are hoisted daily, and over 100 men are employed. At the Glangarry mine the shaft is down 800 ft. and development work is pushed on this level. The shaft being close to Silver Bow Creek, the water is very troublesome.

NORTH WESTERN MINING COMPANY.—This company has several adjoining claims bonded about a mile east of the Silver Bow and Glangarry mines. They are sinking on the North-Western claim, and intend to crosscut their ground from this shaft, which is 300 ft. deep at present. Sinking will be continued until it is down 500 ft.

PARROT COPPER MINING COMPANY.—The Parrot mine is an old and steady producer. The shaft is down 1,000 ft., and about 500 tons of ore are hoisted daily. At the Moscow mine sinking on the vein below the 300-ft. level is in progress; this mine has lately been connected with the railroad by a switch. At the Hesperus sinking is still in progress. The shaft is down 150 ft., and it is intended to sink 400 ft. before crosscutting.

SIX O'CLOCK.—At this mine, located a quarter of a mile northeast of the Atlantic, prospecting is still being prosecuted in expectation of discovering ore

on the east extension of the copper belt. The shaft is down 400 ft. The operators have been working steadily over a year; the sinking was slow and expensive, and they deserve success.

SPECULATOR.—This mine is owned by Pat Largey, and is down 700 ft. It is producing about 50 tons daily, and employs 20 men.

W. A. CLARK'S PROPERTIES.—At the Colusa Parrot the shaft is down 1,100 ft., and the mine produces about 300 tons daily. Machine drills are used and about 100 men are employed. A new ore chute was recently built, which is connected by a switch with the Montana Union Railroad. At the Original mine the new duplex 16 x 36-in. hoisting engine is almost erected. The ore chute at this mine will be connected to the street-car tracks and the ore hauled to the reduction works by electricity.

NEVADA.

HUMBOLDT COUNTY.

MONMOUTH.—It is reported that recent developments on this group, situated in Star mining district, about twelve miles southwest of Mill City, and owned by Messrs. Woolcock and Phillips, disclose a large body of gold and silver-bearing ore. The ledge matter is said to be from 150 to 200 ft. in width, the outcroppings of which can be traced for a mile and a half. It assays well in silver, and from \$3 to \$20 per ton in gold. H. J. Humphreys, of Mill City, is handling the property.

STOREY COUNTY—BRUNSWICK LODGE.

HALE & NORCROSS MINING COMPANY.—By resolution of the board of directors this company, on November 24th, served a formal notice upon the Chollar, Potosi and Savage companies of withdrawal from the contract made between these four companies May 26th, 1896, to sink shaft No. 1 on the Brunswick lode and to contribute one fourth each toward the expense of the undertaking. The contract provides that after the shaft should have reached a point 100 ft. perpendicularly below the depth attained May 26th, 1896, any party should have the right to give notice to the other three that it did not wish to contribute any more money toward sinking to a greater depth, and that after 30 days shall have elapsed after the receipt of the notice by each of the other companies the company giving such notice shall be relieved from further expense on account of sinking the shaft. The Hale & Norcross office state that the company has expended thus far on the Brunswick work about \$30,000, and after a thorough exploration of the ground down to and including the 400-ft. level, no ore of any value has been found. Stockholders are complaining about the assessments, and the directors, after a careful consideration, do not deem it good policy to expend any more money on the Brunswick lode. The 30 days after giving the notice of withdrawal will elapse on December 24th, by which time, the Hale & Norcross people say, they expect that the station will have been excavated at the 500-ft. level. They say further that although the agreement was to sink the shaft only 100 ft. perpendicularly below its depth on May 26th, they have paid toward sinking it 200 ft., to its present depth on the incline of 717 ft., to show their good faith, and instead of withdrawing when the shaft reached the 400-ft. level, they have continued their contributions until it is now down practically to the 500-ft. level. It is understood that the Chollar, Potosi and Savage mining companies will accept the notice of withdrawal of the Hale & Norcross, and will continue the work of sinking shaft No. 1 and share the expense equally.

NEW YORK.

ONEIDA COUNTY.

EMPIRE STATE GRANITE COMPANY.—This company has begun operations again on its quarry on the east side of Mount Eve. The company has five derricks up, a 30-H. P. engine, two hoisting machines, steam drills and other extra implements for improved and rapid quarry work.

WHITE LAKE GRANITE COMPANY.—This company has entered into a contract at Syracuse with Hughes Bros. & Bangs, of that place, to furnish all granite to be used in the work to be done on the Oswego State dam at Oswego, N. Y. The contract price is \$18,750. The quarries of the company, of which Hon. Lucius N. Littauer is president, and John A. Cole secretary and general salesman, are located at White Lake Corners.

NORTH CAROLINA.

ORANGE COUNTY.

GREENSBORO IRON AND STEEL COMPANY.—The iron mine near Chapel Hill has been leased by this company, which will use the ore in its furnaces.

OHIO.

ATHENS COUNTY.

(From Our Special Correspondent.)

SUNDAY CREEK COAL COMPANY.—On December 1st, mine No. 10, belonging to this company, about two miles from Glouster, was discovered to be on fire. The 400 men employed in the mine were hoisted safely by means of the escape shaft. Twenty-eight horses working in the mine were suffocated. Chief Mine Inspector Haseltine brought a company of the Columbus fire department to the mine by special train, but found the upper works entirely consumed. The shaft opening was immediately sealed up in the hope of extinguishing the fire.

PENNSYLVANIA.

ANTHRACITE COAL.

FOREST COAL COMPANY.—This company, whose mine is two miles from Archbald, has been employing quite a large number of Italian miners and laborers to rob pillars. Because of the inexperience of the Italians and the danger of the work, an overseer was appointed who was responsible for the safety of the men and of the mine. On November 18th the number of overseers was increased from one to four, who were paid 6½c. a ton for every ton of coal mined, the money being deducted from the usual price per car. The Italians protested against paying these overseers, and on December 4th went out on strike and ordered everybody about the mine to cease work. The following morning the strikers, armed with guns, clubs and knives, guarded the mouth of the slope and attempted to prevent work from being done. Detectives were brought from Scranton, who with company officials and local officers formed a squad, and with drawn revolvers charged the mob. The strikers retreated and their ringleaders were captured and lodged in jail. Quiet has been restored, and it is believed the trouble is at an end.

HENRY CLAY COLLIERY.—No. 7 vein has been struck in the shaft of this mine, near Shamokin, and the possible output of coal greatly increased thereby. Two more veins will be cut before the bottom of the basin is reached.

LEHIGH VALLEY COAL COMPANY.—Packer Colliery, No. 5, at Park Place, owned by this company, has closed down for an indefinite period, presumably for repairs. Eight hundred men and boys are thrown out of employment.

This company has purchased the Columbus No. 1 colliery at Mt. Carmel from Bickle & Co. and will begin operations in a few days.

LEHIGH & WILKES-BARRE COAL COMPANY.—This company has confessed judgment in favor of the heirs of John Turner for \$12,431.25, as royalties on coal lands in Plymouth Township, Luzerne County. Three years ago the company refused payment of further royalties, alleging that they had paid for all the coal remaining in the ground. Suit was then brought to compel the payment of the minimum royalties so long as the company continued to mine coal. Under Judge Woodward's decision in the case of the Wright heirs against the same company and affirmed by the Supreme Court, the company's position is no longer tenable and they decided to pay.

CUMBERLAND COUNTY.

PHILADELPHIA & READING RAILWAY COMPANY.—This company's ore mines at Boiling Springs have resumed operations after lying idle for a period of 12 years.

SOUTH DAKOTA.

LAWRENCE COUNTY.

COOPER CONSOLIDATED.—Work has been resumed at this property in Ruby Gulch, Galena District, taking out ore and sacking it. The vein has been followed for 1,200 ft. and sunk to a depth of 90 ft. There is a pay streak that runs high, and there are now on the dump 1,000 tons of \$10-ore that the owners cannot treat on account of the cost. It is especially adapted to treatment by cyanide.

UTAH.

JUAB COUNTY.

ALASKA.—Morris R. Hunt and associates have acquired a controlling interest in this property at Silver City. Development will begin at once, with J. R. Price as superintendent. The Alaska is located on the line of the Humboldt zone, and in former years is said to have been productive of ore of the value of several hundred thousand dollars. The intention is to continue the main working shaft on the property, which is now down 76 ft., to a depth of 300 ft.

TOOLE COUNTY.

GOLDEN GATE GROUP.—The American Cyanide Gold and Silver Recovery Company of Denver, Colo., has just closed a contract with Capt. DeLamar for a 400-ton dioxide-cyanide mill, on this group of mines, in the Mercur District. He is at present working this process at his Nevada group of mines, to a capacity of 220 tons per day.

SACRAMENTO.—The management at present is working in six drifts that give average values of from \$20 to \$25 per ton. The company states that the vein averages 50 ft. in depth. Weekly shipments of cyanides are made, now valued at about \$4,000 per shipment.

VIRGINIA.

CHESTERFIELD COUNTY.

WESTHAM GRANITE COMPANY.—This company, owning large quarries, has made an assignment. Colonel R. Snowden Andrews, of Baltimore, Md., who has made an assignment in that city, is president of the company. Liabilities, \$89,000, and large assets.

WASHINGTON.

KITTITAS COUNTY.

(From Our Special Correspondent.)

DUTCH MILLER LODGE.—More interest has been manifested in this new find than in any other discovery in this district for years. A half-breed Indian named Burns first brought in the samples and Mr. Miller, a white man, returned with him, making locations. Since that time several mining men have gone in and examined the property. This cop-

per property has a 10-ft. ledge between two granite walls, showing plainly for 200 yds., and then at intervals it crops, showing a width in places of 27 ft. Its value is 27% copper, 14 oz. to 40 oz. silver, and a small value in gold. This ledge, on which 10 locations have been made, crosses the divide and is partially in Kittitas and King counties, the north end being about 8 miles from the Great Northern Railroad, at its loop near Skykomish. The new district is known as the Burns Mining District, King County, and its formation is principally granite, with some slate and porphyry.

FORTUNE.—This copper property has been sold to R. C. Corey, of Seattle, by Swain & Haight, of Roslyn. Mr. Corey will put a force of men at work and continue development, and expects to ship ore in the early spring.

OKANOGAN COUNTY.

HAPPY THOUGHT.—Col. J. Robert Moore has a 3-ft. ledge in this mine, at Meadow Creek, in which he has just discovered from 8 to 10 in. of ruby silver and gray copper.

PALMER MOUNTAIN TUNNEL COMPANY.—This company is running a tunnel through the mountain in which are ore veins carrying gold and silver. The total length when completed will be 3,500 ft., and they expect to cut the Black Bear ledge at a depth of 1,100 ft. Several blind leads have been met that are proving of value.

SNOHOMISH COUNTY.

APEX.—The owners of this mine in Money Creek District, have run a tunnel 300 ft. on the vein, and drifted 225 ft. Their last shipments netted \$50 per ton.

STEVENS COUNTY.

BROAD GAUGE.—This silver mine, near Meyer's Falls, owned by Spokane men, has resumed work, after being shut down a month. John Roberts, formerly of the Bunker Hill and Sullivan, is foreman. The tunnel is in 150 ft. and its minerals and assays are encouraging.

ECHO COPPER MINING AND MILLING COMPANY.—This company, of Spokane, which was lately incorporated for \$1,000,000, held a meeting recently and elected the following officers: Hugh C. Wallace, president; J. H. Hughes, vice-president; E. W. Stoffield, treasurer; M. E. Logan, secretary; W. H. Brinker, attorney. The above, with C. M. Fassett and L. M. Flournoy, were elected trustees. The property of the company is located on the reservation. They have a shaft down 37 ft., and are taking out ore with a good per cent. of copper. They have decided to let a contract to extend the shaft to the 75-ft. level, and the work will be commenced at once.

WEST VIRGINIA.

MINERAL COUNTY.

BIG VEIN MINING COMPANY.—The miners of this company, at Shaw, are on strike against the methods of payment in vogue at the mines. The miners at other plants are meeting with a view to taking similar action. The miners demand a check weighman and pay by the bushel or ton weight, instead of by the car, as at present.

PRESTON COUNTY.

COAL LANDS SOLD.—Forty thousand acres of coal lands were sold December 2d to a syndicate composed of S. M. Guffey, Mellon Brothers, and Stratton & Company, of Pittsburg; John Sliney, of Corry, Pa., and the builders of Cheat River Railroad. The price was \$10 an acre. T. L. Mensill, civil engineer and geologist, who has completed a map of the tract, says it is a rich field, the vein being very thick and of splendid quality for coking.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

SLOCAN DISTRICT.

LAST CHANCE MINING AND MILLING COMPANY.—This company, with mines near Sandon, paid its first dividend, amounting to \$20,000, on November 20th. This payment was made from the net earnings of 550 tons of argentiferous galena ore after the 150 acres of land purchased by the company were paid for.

TRAIL CREEK DISTRICT.

(From Our Special Correspondent.)

BRITISH COLUMBIA TUNNELING AND DEVELOPMENT COMPANY, LIMITED.—This is a newly incorporated company. Its promoters are J. F. McLaughlin, W. A. Campbell and John J. Moynahan, and Frank Waverly, consulting engineer. The object of the company is to put a tunnel through Red Mountain at its base, starting at a point near Rossland, and running in a direct line through the center of the mountain to the opposite side. This tunnel is to be of sufficient width and height to enable the company to lay double tracks, on which it is proposed to operate electric cars to convey to the mouth all the ore taken from the various mines on the mountain. It is also proposed to make a single branch tunnel to such mines as the main tunnels do not pass through.

DUNDEE GOLD MINING COMPANY.—The property of this company is in the Salmon River County, 8 or 9 miles north from Salmon Siding, and about a mile and a half from the railway track. The vein is 15 ft. wide. The ore carries gold values so far as saying as high as \$13. The officers of this company

are Charles Dundee, president; V. Robert Scott, vice-president; W. A. Gallagher, treasurer; Messrs. Weeks and Kennedy, secretary. J. L. Parker, consulting mining engineer and superintendent. Capital, \$1,000,000.

RED EAGLE GOLD MINING COMPANY.—The Red Eagle claim adjoins the Mayflower in the south belt. Three distinct ledges have been found. One of these veins runs through the Curlew, and assays from this have reached from \$12 to \$50 in gold and silver. One of the ledges, known as the south ledge, was a vein of ore 20 in. in width. The iron hat is highly mineralized. It seems incredible that the gossan should assay as high as \$285 to the ton, yet a piece of the iron hat from the Red Eagle is at the company's office, and Mr. Cover, one of the officials of the company, is my authority for the figures. The officers of the Red Eagle are: W. H. Fife, of Tacoma, Wash., president; William Bennisson, Rossland, vice-president; T. G. Elgie, secretary and treasurer; J. W. Cover is managing director, and C. W. Callaghan consulting engineer. The capitalization is \$1,000,000. The head office of the company is at Rossland, B. C.

BRITISH GUIANA.

BARIMA GOLD MINING COMPANY.—This company reports for November a total of 90 tons quartz crushed, the recovery being 650 oz. gold, or at the rate of 0.71 oz. gold per ton.

MEXICO.

SONORA.

COLORADO-SONORA MINING AND MILLING COMPANY.—This company, whose capital is \$2,500,000, has secured a bond on the Baviconora mine. The officers are Ward Hunt, president; Robert A. Norton, vice-president; J. B. Glasser, secretary and treasurer. Thomas H. Edsall and R. A. Norton and J. P. Havlick, of Denver, will be directors. The property is one mile long and 325 ft. in width. Through the center of this is a mineral vein. The purchase will include 9,000 acres of timber land surrounding the mine. The work has been worked 15 years and the ore has been extracted up to 85% of its value by pan amalgamation. There are thousands of feet of tunnels and drifts. The ore is chloride, horn silver, black malleable silver carrying silver and gold.

NEW SOUTH WALES.

SULPHIDE CORPORATION.—At a special meeting held in London recently the chairman stated that when this company was formed the patent rights were secured for the treatment of sulphide ores in all parts of the world, exclusive of North and South America. The Sulphide Trust, which is composed of four gentlemen in Australia, who were the vendors and the owners of the American patents, contemplated disposing of the American rights to a separate company; but a few months ago negotiations were opened up with this corporation with a view of seeing whether a satisfactory arrangement could be made by which the Sulphide Corporation could acquire these rights, thereby obtaining practically the Ashcroft patents for the whole world. These negotiations have resulted in the arrangement submitted for approval. The terms of the proposed purchase are as follows: The Sulphide Corporation to issue to the Sulphide Trust 50,000 preferred shares, in consideration of which the corporation is to receive the sum of £50,000 in cash, being the par value of the preference shares. In addition the trust is also to have allotted to it 50,000 ordinary shares, both classes of shares ranking with the existing 500,000 preference and 500,000 ordinary shares which formed the original capital of the corporation. If the proposed arrangement is sanctioned by the proprietors the ordinary capital of the company will then consist of 550,000 preference and 550,000 ordinary shares. The advantages to be obtained by the corporation holding the whole of the patent rights are manifest. The Chairman added that at the time of the last meeting in February the board had reported negotiations in progress for a suitable site on which to erect works. These negotiations resulted in the company acquiring a lease for 20 years of about 400 acres of land, at a rental of £225 per annum, with a right of renewal upon the same terms for a further period of 20 years. The site is in the center of a coal district, and both fresh and salt water—which are most essential in the conduct of operations—are readily obtainable, and it is within a short distance of a main line of railway, from which a connection has already been effected, by means of a branch line, for the purpose of dealing with the company's traffic. The site having been secured, and possession obtained on March 1st last, the erection of the various buildings, plant and machinery was proceeded with; very considerable progress has been made, and it is anticipated that the works will be in operation in January next. At the company's mine at Broken Hill a concentrating plant has been erected capable of treating no less than 3,000 tons per week, which will be in full working soon; the first section is running, with satisfactory results. With the concentrators at Broken Hill in full work, 3,000 tons will be dealt with weekly, and 750 tons of concentrates produced. The stockholders voted to approve the arrangements proposed.

NOVA SCOTIA.

CAPE BRETON.

DOMINION COAL COMPANY.—This company reports the shipments of coal from its mines for the nine months of its fiscal year from March 1st to November 30th at 862,900 tons, showing an increase

of 224,540 tons, or 30.4%, as compared with the corresponding period last year.

GUYSBORO COUNTY.

(From Our Special Correspondent.)

BLUE NOSE COMPANY.—This company, of Golden-ville, has just completed a new 20-stamp mill, also a modern pumping, hoisting and mining outfit.

DUFFERIN.—Mr. R. G. Leckie, President Nova Scotia Mining Society and Past Vice-President A. J. M. E., has secured a six months' working option on this mine, on Salmon River. The option price is \$100,000. This mine produced largely from 1880 to 1890, frequently yielding from \$20,000 to \$30,000 per month, eight-tenths of which was profit. Prosperity completely upset the managing owner, and the mine was permitted to run down.

NEW GLASGOW COMPANY.—This company of Golden-ville, with James A. Fraser, manager, has a little 10-stamp mill. Two years ago they started with a production of 50 oz. per month, and a pay roll of \$1,500 per month. They are now producing over 200 oz. per month, with the same pay roll and are doing a large amount of development work. Their leads have gradually increased in width and richness as depth has been attained.

LATE NEWS.

BUTTE & BOSTON MINING COMPANY.—It is understood that the obstacles to the reorganization of this company have been removed by the sale of the 90,000 shares of stock owned by the Davis estate to a Boston syndicate. The price paid is said to have been \$2 per share.

ROBERT G. CLARKE, of Chicago, a well-known mining man, was killed in the Gold Cup mine, in the settlement of Tin Cup, Colo., December 10th. He slipped on an incline coated with ice, and was precipitated down the shaft of the mine 80 ft. Death resulted instantly.

ZARUMA GOLD MINES.—On the steamship *Finanza*, that sailed for South America December 10th, there left New York an important mining expedition. The party was headed by W. E. Newberry, son of the celebrated Professor of Geology of Columbia College. He was accompanied by Mr. J. B. Lowell, Carpenters, blacksmiths, miners and a mine foreman were in the party, that included 14 persons. They go to open up a historic gold mining district, located near Zaruma, in the southern part of Ecuador. This property is now controlled by the South American Development Company, of which the well-known mining engineer, Wm. Van Slooten, is president. The company is backed by capitalists in this country.

ALBERT NOBEL died at San Remo, Italy, December 9th. He was a Swiss engineer, and was a pioneer in the use of high explosives. In 1863 he realized the possibilities of nitro-glycerine and began the series of experiments which led him finally to success. After many trials he adopted the method of detonation first tried by General Pictet with gunpowder some 10 years earlier. Realizing that the liquid nature of the substance constituted the serious obstacle to its safe transport, Nobel hit upon the expedient of mixing it with solid substances capable of absorbing and retaining considerable quantities of it, and thus the future of nitro-glycerine as one of the most effective of blasting agents was assured. He first used charcoal as an absorbent, but finally selected the silicious earth known as kieselguhr. The use of this preparation for industrial purposes has increased enormously year by year since 1867, when 11 tons of it was produced. Nobel also invented the form of nitro-glycerine called blasting gelatine.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 11.

Statement of shipments of anthracite coal (approximate) in tons of 2,240 lbs., for the week ending December 5th, 1896, compared with the corresponding period last year:

	1896.		1895.
	Week.	Year.	Year.
Pennsylvania Railroad.....	80,479	3,479,424	3,550,692

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending December 5th, and for years from January 1st, 1896 and 1895:

Shipped East and North:	1896.		1895.
	Week.	Year.	Year.
Allegheny, Pa.....	45,682	3,555,757	2,728,830
Barclay, Pa.....	1,110	43,792	138,303
Beech Creek, Pa.....	73,232	2,849,457	2,753,426
Broad Top, Pa.....	.....	315,630	585,066
Clearfield, Pa.....	81,993	4,094,689	4,773,251
Cumberland, Md.....	82,037	3,314,669	12,806,677
Kanawha, W. Va.....	189,378	3,406,302	2,838,540
Phila. & Erie.....	11,373	86,830	48,892
Pocahontas Flat Top.....	.....	2,653,904	12,322,901
Totals.....	386,305	20,341,021	18,638,886

* For year ending October 31.
† For week ending November 21st.
‡ For year ending December 11th, 1895.
§ For year ending December 21st, 1895.

Shipped West:	1896.		1895.
	Week.	Year.	Year.
Monongahela, Pa.....	23,201	1,158,504	725,187
Pittsburg, Pa.....	36,701	1,747,278	1,549,933
Westmoreland, Pa.....	42,674	1,778,391	1,604,768
Totals.....	102,576	4,684,173	3,879,828
Grand totals.....	488,881	25,023,194	22,578,714

Production of coke on line of Pennsylvania Railroad for the week ending December 5th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 68,491 tons; year, 3,593,321; to corresponding date in 1895, 5,567,377 tons.

Anthracite.

The anthracite-coal trade during the past week has been very quiet, and general conditions, so far as prices are concerned, remain as previously reported. Orders for stove coal at \$4.10 on board would not be turned down by any of the producers. Chestnut coal is very slow, and is rapidly accumulating, so that purchasers can obtain it almost at their own price. Egg coal is in best demand, and the September schedule is more nearly realized on this size than on any of the others. The sale for pea and buckwheat coal is still very limited, but is reported to be picking up to a slight extent. Weather conditions remain unfavorable to an increase of business, and until ice and snow come to stay an improved trade need not be looked for. The tonnage for December is a point upon which little information is obtainable, but 3,500,000 tons is now the figure received from some sources. It appears to be the general desire to make it as large as circumstances will warrant.

Bituminous.

The Atlantic seaboard soft-coal trade is very little changed from our last report. There seems to be an inclination to close up, where it is possible, any uncontracted balances by people who have held the first part or parts of contracts. There are a few more orders coming from the far East than last week, which have about made up for any falling off in shipments to the Sound ports. The effort is still to ship to the latter points from the lower shipping ports, as the ocean freight rates from them are more advantageous than from the New York harbor shipping ports.

New York harbor trade is unchanged and keeps on in about its regular volume. Trade local to the shipping ports is quiet, though some small shipments are being made. There is some small South American business doing.

Transportation from mines to tide is good; also on all-rail shipments. Car supply is up to all demands.

In the coastwise vessel market the demand for vessels is slightly in excess of the supply, and some of the smaller class of vessels are seeking and securing charters to ports near the homes of captains to lay up for the winter.

We quote current rates of freight from Philadelphia as follows: To Boston, Salem and Portland, 70¢@75¢; Providence, New Bedford and other Sound Ports, 65¢; Portsmouth, 75¢; Wareham, 80¢; Lynn, 85¢@ \$1; Newburyport, 85¢@90¢. Ten cents above these rates are asked from Norfolk, Newport News and Baltimore.

The association prices remain as follows: F. o. b. Philadelphia, Norfolk and Newport News, \$2.35; Baltimore, \$2.28; New York Harbor shipping ports, \$2.80, alongside; New York Harbor, \$3. There is a 20c. differential in favor of Clearfield and Beech Creek coals.

NOTES OF THE WEEK.

Coal receipts by water at San Francisco in November were 110,287 tons; for the 11 months ending November 30th they were 1,170,822 tons, a decrease of 133,843 tons, or 10.3%, as compared with last year. The sources of supply this year have been: Eastern, anthracite and Cumberland, 17,856 tons; Oregon and Washington, 413,643; Alaska, 800; British Columbia, 390,521; Australia, 210,997. Tonkin, 1,487; Great Britain, 135,518 tons. These receipts do not include coal from the Mt. Diablo mines in California.

Buffalo.

Dec. 10.

(From Our Special Correspondent.)

No changes to note in the anthracite and bituminous-coal trade. Demand fair at unchanged quotations. Navigation may continue yet for several days, as the weather is now mild and pleasant. The last vessel from Duluth left there on December 7th. Stocks of coal are ample for all requirements, and to save demurrage on unloaded, bituminous can be bought occasionally at very low rates.

News items are scarce. The list of vessels and lives lost on the lakes during 1896 is much lower than the average.

Contracts have been given out for 17 vessels to be built at lake ports the coming winter and spring of the value of \$2,350,000. Who says vessel men have no confidence in the future prospects?

The shipments of coal westward by lake from November 29th to December 5th, both days inclusive, aggregated 68,975 net tons, distributed as follows: 48,800 tons to Chicago, 18,300 tons to Milwaukee, 1,300 tons to Superior and 575 tons to Windsor. The rates of freight were 60c. to Chicago and Milwaukee, 50c. to Superior and 30c. to Windsor.

The following statistics of the coal trade of Buffalo, N. Y., were prepared by Mr. William Thurstone, secretary of the Merchants' Exchange, showing the season's business to December 1st, 1896, and for a series of years:

Railroad receipts and shipments of coal at Buffalo not reported by request. Receipts of coal by lake for this and for several years past none. Ship-

ments of coal westward by lake for the month of November 367,610 net tons, as compared with 533,708 net tons in 1895, and 433,050 net tons in 1894; for the season to December 1st, 2,320,688 net tons, as compared with 2,466,033 net tons in 1895, and 2,336,405 net tons in 1894. The receipts of coal by canal for November 983 net tons, as compared with 1,228 net tons in 1895, and 8,862 net tons in 1894; for the season to December 1st, 40,061 net tons, as compared with 12,382 net tons in 1895, and 39,149 net tons in 1894. The shipment of coal by canal in November was 849 net tons, as compared with none in 1895, and 2,113 net tons in 1894; for the season to December 1st, 2,045 net tons, as compared with 4,289 net tons in 1895, and 8,838 net tons in 1894. The aggregate shipments of coal this season show a decrease of 175,365 net tons under 1895, and 15,737 net tons under 1894.

The rates of freight for November this year were 30c., 40c., 60c. to Chicago and Milwaukee; 20c., 30c., 50c. to Duluth and Lake Superior ports, Gladstone; 20c., 50c. to Ashland; 40c. to Saginaw, Racine and Green Bay, and 25c., 30c. to Toledo. A year since the rates were 75c., 90c. to Chicago; 80c., 85c. to Milwaukee; 85c., 90c. to Sheboygan; 85c. to Green Bay; 65c., 70c. to Saginaw; \$1 to Racine; 50c. to Toledo; 50c., 60c. to Bay City, and 30c. to Ashland and Washburn.

The distribution of coal this season was about as follows: 934,157 net tons to Chicago, 625,706 tons to Milwaukee, 231,960 tons to Duluth, 88,090 tons to Toledo, 36,334 tons to Manitowoc, 29,800 tons to Gladstone, 10,950 tons to Ashland, 189,331 tons to Superior, 13,075 tons to Marquette, 12,439 tons to Fort William, 4,420 tons to Sault Ste. Marie, 1,070 to Portage, 11,860 tons to Lake Linden, 225 tons to Goderich, 74,300 tons to miscellaneous ports by vessels from Tonawanda, 1,750 tons to Marinette, 5,200 tons to Hancock, 400 tons to Ontonagon, 3,150 tons to Detroit, 1,200 tons to Benton Harbor, 3-8 tons to Midland, 800 tons to Sheboygan, 550 tons to Sturgeon Bay, 475 tons to St. Clair, 678 tons to Windsor, 100 tons to Alpena, 300 tons to Manistique, 500 tons to Huron, O., 23,875 to Racine, 400 tons to Marine City, 450 tons to Algonac, 3,350 tons to Washburn, 26,260 tons to Green Bay, 8,890 tons to Kenosha, 200 tons to Oscoda, 14,665 tons to Bay City, 13,345 tons to Saginaw, 525 tons to St. Ignace, 2,050 tons to Menominee, 1,250 tons to Sheboygan, 300 tons to Bay Mills, 1,150 tons to Port Huron, 600 tons to Grand Haven, 2,100 tons to Port Arthur, 320 tons to Sandbeach, 2,125 to Michigan City and 25 tons to Grand Marais.

A few additions will be made to the Chicago, Superior and Milwaukee shipments figures for December, and then the preceding statement will show the year's movement.

Chicago.

Dec. 9.

(From Our Special Correspondent.)

Anthracite.—Business in anthracite coal fluctuates greatly, the weather being entirely responsible. Last week we had a real cold wave, and it continued for several days, greatly augmenting sales. The past week's climate has been comparatively mild and consequently we have to report a much depressed business. Out-of-town trade has been brisk up to a few days ago, but it is expected that colder weather will again increase it. The trade done in the past week has, however, been of a fair aggregate and this is undoubtedly due to better industrial conditions. Some very good contracts are being taken, though circular prices are, without a doubt, being knocked in the head. Circular prices are: Grate, \$5.60; egg, stove and chestnut, \$5.85. Retail prices are \$6.75@ \$7.

Bituminous.—Soft coal has been in good demand during the week and the sales readily show that there is a great increase in the manufacturing industries. The combined tonnage for the week is large, and compared with a month ago there is an increased trade of fully 50%. Prices are becoming much firmer and the outlook is for an advance if anything.

Coke.—Both foundry and crushed coke are gaining steadily, and higher prices are looked for.

Pittsburg.

Dec. 10.

(From Our Special Correspondent.)

Coal.—There is a moderate demand for coal for local purposes; prices show no quotable change. The adjustment of the coal-mining rates for the three great bituminous States will occupy the attention of the trade this week. The problem is far from an easy one to solve with justice to all the interests at stake, but if all the parties take hold of it in a generous spirit and with determination to settle it justly, it will be much easier. The operators of Ohio have been enjoying advantages over their Pittsburg brethren that they ought to forego, and in turn the Pittsburg operators might make concessions to their miners that would give them at least living wages for their labor. Keating & Company, with mines on the South Side, have advanced the rate for digging to 60c. A demand was made by the Banksville miners, but it was refused; after a three days' strike all went to work at 54c.

At Morgantown, W. Va., a very extensive coal deal was commenced on Thursday; it is known as the Preston County land deal. The members of the purchasing syndicate are S. M. Guffy, Mellon Bros. and Stratton & Company, of Pittsburg; John Silney, of Corry, Pa., and the builders of the Cheat River Railroad. The tract contains 40,000 acres; the price paid was \$10 an acre.

The river is at good boating stage; no coal ready. The conference committee of river miners and oper-

ators yesterday settled their differences. The miners in the first three pools will work for \$2.37½ per 100 bu., and the fourth pool diggers for \$1.87½ per 100 bu. The miners practically agreed to work for this at a previous meeting, but did not place a time limit on when the contract should expire. This was decided on as July 1st, 1897. The new price is equal to 63c. a ton in the lower pools and 49c. a ton in the fourth pool.

Connellsville Coke.—The Southwest Connellsville Coke Company started 583 ovens at various points; this company's 1,200 ovens are all running. The trade is steadily improving; in three weeks the active ovens have increased from 5,000 to 8,200 and production has risen from 69,155 tons per week to 77,987. The workmen are paid better now than ever before; the operators believe that the business improvement will be permanent. Report is current that there is an agreement to keep furnace coke at \$3; at the same time contracts have been made with furnaces below that figure.

A summary of the region of the week shows 8,396 ovens in blast, with 9,891 idle. The new Bessemer plant fired 50 ovens and 50 more were preparing. In the running order of the ovens in blast last week, 954 ovens made six days; 5,359 ovens made five; 2,008 ovens four days; 50 ovens of the Bessemer plant made three days and 25 ovens made seven days; average, 4.89 days. The next report of production will show a marked increase. The week's shipments were distributed as follows: To Pittsburg and way points, 2,172 cars; to points west of Pittsburg, 1,995 cars; to points east, 559 cars.

Shanghai, China. Nov. 6.

(Special Report of Wheelock & Co.)

Coal.—Rates of freight on Japan coal between this city and Nagasaki still remain very low, owing, no doubt, to the very small stocks there and the limited demand on this market, which is still weak. Very little variation has taken place since last writing. Cardiff coal is without inquiry. Upon the arrival of 1,124 tons of Sydney Wollongong coal on October 28th, the market dropped considerably, and sales were made at 6.75@6.50 taels. On November 2d there was a further arrival of 1,000 tons. The market is very weak.

We quote: Cardiff, 12 taels per ton; American anthracite, 9 taels per ton; Sydney Wollongong, 6.75 taels per ton. Japan coal is 5.75 taels for Takasima lump, 5 taels for Namazuta lump and 3.75@4 taels per ton for other sorts.

Kerosene Oil.—Although there has been a very large business it has been confined entirely to second hands. The market for Devoo's during the first part of the period under review was firm at 1.75 taels per case, at which price a good quantity changed hands; it then took a very sudden spurt, and transactions were made at various prices until 1.82 taels per case was reached, the highest we have seen for some years, and even at this figure, notwithstanding the tightness of money, many offers have been made but refused. In Russian we are able to report only a slight advance, as business has not been done to any great extent, 1.67 taels per case being the top price. There is no stock of Langkat, and quotations are purely nominal. On October 23d, 30,000 cases arrived, which makes stocks at present as follows: Devoo's, 514,000 cases; Russian, 230,000 cases.

Quotations are as follows, per case: American Devoo's, 1.82 taels; Russian Batoum, 1.67 taels; Russian Batoum, bulk, 1.57½ taels; Langkat, 1.60 taels.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Dec. 11, 1896.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Dec. 13, 1895.	Dec. 11, 1896.	Jan., '95.	Jan., '96.	Tons.	Tons.
Anthracite.	59	38,030	29	16,950	1,184,367	1,124,610
Coke.....	162	184,150	99	122,550	7,398,030	6,965,004
Charcoal....	23	5,450	20	5,250	211,395	283,365
Totals....	244	227,630	148	144,750	8,793,392	8,275,979

The general current of business is good, considering that December is usually a dull month in the iron trade. A fair amount of business is reported and the furnaces and mills make a much better showing than they did a month ago.

The pig-iron movement is improving; though, as we anticipated, prices are not rising. The quantity of iron stored and held for speculation will prevent any material change in this respect.

The meeting of the Rail Association is looked forward to with much interest, and there are all sorts of reports as to the probable action on prices for next year; but none of them have much basis. There is a general impression that a lower price will be made; but this is quite possibly a mistaken one.

Interest this week is chiefly in the troubles of the Steel Billet pool, which appears to be undergoing a general break-up. Several companies have withdrawn, charging underhand and unfair dealing; pool prices are not maintained, and billets are being offered at prices considerably lower than those fixed by the association. A meeting is being held in Pittsburg to see what can be done, but it does not seem possible now to stop the disintegration, or to re-establish the pool on a solid foundation.

New York. Dec. 11.

The local market is quiet in most directions, as it is usually at this season. The structural department is showing some activity and some large contracts are under discussion. The reported decision of the Metropolitan Traction Company to change three of its lines from horse to electric traction of the underground type will make a good deal of work, and there is a corresponding amount of talk about the contracts.

Pig Iron.—Business has been quiet, and not much can be looked for from now until the close of the year. The foundries will be busy taking stock and closing up their accounts, and little new work will be started until after the holidays.

For Northern iron we quote: No. 1 foundry, \$12.50@13; No. 2 foundry, \$11.50@12; No. 2 plain, \$11@11.50; gray forge, \$11@11.50. For Southern iron we quote: No. 1 foundry, \$11.75@12; No. 2 foundry, \$11@11.50; No. 3 foundry, \$10.50@11; No. 1 soft, \$11@11.50; No. 2 soft, \$10.50@11; forge, \$10.50@11; basic pig, \$11.50@11.75. All prices are for tidewater delivery.

Cast-iron Pipe.—No new contracts are reported. Orders for Spring delivery are talked about, but none have appeared as yet.

Spiegeleisen and Ferro-Manganese.—There have been no sales to be noted. Ferro-manganese is quoted at \$46.50@47 for imported 80%, New York.

Steel Billets and Rods.—The pool prices are \$21.75, New York, for Bessemer billets, and \$23.75, New York, for open-hearth billets. Rods are \$23@29, with few sales. These prices are not maintained, however, owing to the troubles in the pool noted above. Billets have been offered here, and some sales made, at \$20, while it is reported (though not confirmed) that an offer of a large lot was made at \$19.50, deliveries to run well into next year. No one is paying pool prices.

Merchant Iron and Steel.—Business continues quiet with chiefly small sales. Prices show no change. For bars we quote: Common, 1.10@1.15c.; refined, 1.20@1.45c.; soft steel bars, 1.20@1.30c. Other quotations are: Steel hoops, 1.50@1.60c.; steel axles, 1.60@1.75c.; links and pins, 1.60@1.70c.; tire steel, 1.80@1.90c.; spring steel, 1.95@2.15c. All prices are for delivery on dock New York.

Plates.—Sales are light, and, without quotable changes, prices are not so firm. We quote for universal mill plates, 1.30@1.40c.; for steel plates we quote: Tank, 1.25@1.35c.; boiler shell, 1.45@1.55c.; good flange, 1.60@1.75c.; firebox, 1.90@2.40c. Charcoal iron plates are quoted 2.25c. for shell, 2.75c. for flange, and 3.25c. for firebox. Rivets are 2.15@2.25c. for steel and 3@3.25c. for iron.

Structural Iron and Steel.—Some large contracts are on the market. The disintegration of the beam pool has resulted in lower quotations, and at present it does not look as if the efforts to restore it would be successful. We quote for angles, 1.25@1.35c.; channels, 1.65@1.70c.; tees, 1.60@1.65c.; beams, 1.50@1.60c. for large lots, and 1.70@1.80c. for small orders.

Steel Rails and Rail Fastenings.—The combination price is still \$23.75 per ton at tidewater or \$23 at mill, for heavy sections. Girder rails are \$29@31, tidewater. No business is noted.

Little is doing in rail fastenings. Angle-bars are 1.15@1.25c. and spikes 1.60@1.65c., tidewater delivery. Bolts are 1.85@1.95c. for square nuts, and 1.95@2.05c. for hexagon nuts.

Wrought-Iron Pipe.—Orders are coming in for small lots. Discounts are as follows for plain pipe, out of store: 1½ in. and over, 67, 10, 10, 10 and 5%; 1¼ in. and under, 57, 10, 10, 10 and 5%. Galvanized pipe, 1½ in. and over, 55, 10, 10, 10 and 5%; 1¼ in. and under, 52, 10, 10, 10 and 5%. Boiler tubes, 1 in. to 2½ in., 70, 10 and 5%; 2½ in. up, 70 and 5%. Cold-drawn seamless steel tubes, 60%.

Nails.—The market has been gradually settling into shape, and the confusion following the dissolution of the pool is clearing away. A fair quotation for wire nails this week is \$1.50@1.55, Pittsburg, equivalent to \$1.70@1.75, New York, for large lots. For cut nails, \$1.40@1.45, Pittsburg, may be given.

Old Rails.—Old iron rails are quoted \$12.50@13.50, New York. Old steel rails are quoted \$10.50@11.50, with few sales. Old steel rails fit to relay, standard sections, can be had at \$19@22, New York harbor delivery, according to condition. Sales are reported here of several lots of old wrought-iron pipe at \$7.50@8 per ton.

Scrap Iron.—Some sales are reported, with more inquiry for good lots. We quote for good machinery scrap \$10.50@12 per ton; ordinary cast scrap, \$8@9.50; stove-plate and mixed, \$6.50@8. Some sales of old car wheels are noted at \$11@11.50 per ton, New York delivery.

Buffalo. Dec. 9.

(Special Report of Rogers, Brown & Co.)

With the exception of an occasional large sale for long delivery the orders booked in this vicinity during the past week have been of the carload and hundred-ton variety. It is generally conceded that not much, if any, advance may be looked for before the new year, largely owing to the fact that the majority of foundries wish to reduce their stock on hand for inventory and carry just as little as possible at that time. We hear of odd lots of Southern iron

being offered at cut prices, but only for immediate shipment. Lake Superior charcoal remains quiet and no large sales of any importance have been noted. We quote below, on cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$12.25@12.50; No. 2 strong foundry coke iron, Lake Superior ore, \$11.75@12; Ohio strong softener, No. 1, \$12.35@12.60; Ohio strong softener, No. 2, \$11.85@12.10; Jackson County silvery No. 1, \$14.25@15.25; Southern soft No. 1, \$12.25@12.50; Southern soft No. 2, \$11.75@12; Lake Superior charcoal \$14@14.50.

Chicago. Dec. 9.

(From Our Special Correspondent.)

Pig Iron.—Business in pig iron remains about on a par with the preceding week, sales continuing to be almost entirely in carload up to 100-ton lots, though a few larger ones are noticed, one being for 1,000 tons Northern iron. Southern iron has been in fair demand, but only in small lots. Prices are firm, and there appears somewhat of a tendency to advance them after the first of the new year. There is considerable iron being shipped on former contracts. Quotations are as follows: Lake Superior charcoal, \$13.50@14; local coke foundry, No. 1, \$11.75@12.25; No. 2, \$11.25@11.75; No. 3, \$11@11.25; local Scotch foundry, No. 1, \$11.75@12.25; No. 2, \$11.25@11.75; No. 3, \$11@11.25; Southern coke, No. 1, \$11.90@12.40; No. 2, \$11.40@11.90; No. 3, \$10.90@11.40; Southern, No. 1, soft, \$11.40@11.90; No. 2, soft, \$11.15@11.40; Southern silveries, No. 1, \$11.15@11.65; No. 2, \$10.90@11.15; Ohio silveries, No. 1, \$15@15.55; No. 2, \$14.50@15.05; Ohio strong softeners, \$14@14.28; Alabama car wheel, \$16.25@16.75; coke, Bessemer, \$13@13.50.

Bar Iron.—Contracts for a fair tonnage were let during the week, though nothing very large is noticed. Expectations are great for January business. Bar iron is quoted, common, 1.15@1.20c.; guaranteed, 1.20@1.25c.

Steel Rails.—Business for the week has been confined to a few sales of small quantities. Inquiry is better, and next year is looked to increase trade very greatly. Rails are still quoted \$29, Chicago.

Billets and Rods.—Trade in both billets and rods has been moderately good, sales of both commodities having been made in fair-sized lots. There is, however, no prospect of any large business for the remaining portion of this year. Billets are quoted \$21.25 and rods \$27.50, Chicago.

Structural Material.—Some contracts for both building and bridge shapes have been let during the week. Nearly 3,000 tons in all were placed. Prices are inclined to weakness. Quotations are: Beams and channels, 1.65c.; angles, 1.30@1.35c.; tees, 1.60c.; plates, 1.30c.

Old Rails and Wheels.—But few sales in either of these are observed. Prospects are not bright for any business before January. Old iron rails are quoted \$14.50, and old wheels \$13@13.50.

Cleveland. Dec. 9.

(From Our Special Correspondent.)

Iron Ore.—Although no large sales have been made during the past ten days, some satisfactory orders have been filled, and the brokers said to-day that the business was fully as good as could be expected, considering the season and the recent business depression. The sales have been in both Bessemer and non-Bessemer. There is practically no movement of ores from the Upper Lakes, and the probabilities are that by the end of the week the last cargo of the season will have arrived at the Ohio ports. The movement of ores to the furnaces is slowly but steadily increasing, to supply the demand of the increasing number of furnaces in blast. The quotations follow. Standard hard speculars, Bessemer quality, \$4.50@5; standard hematites, Bessemer quality, \$4@4.25; standard hard hematites, non-Bessemer quality, \$3.50@3.75; standard soft hematites, non-Bessemer quality, \$2.50@3.25.

Pig Iron.—A few sales of foundry iron have been reported, but the whole amount sold has been small. The quotations on Bessemer irons are a shade lower on account of the moderate trade. The other quotations are unchanged this week. They follow. Lake Superior charcoal, \$13.50; Bessemer, \$12.25@12.50; No. 1 foundry, \$12.15; No. 2, \$11.65; No. 1 Ohio Scotch, \$12.15; No. 2, \$11.65; Mahoning and Shenango Valley neutral mill irons, \$10.75; Mahoning and Shenango Valley red short mills, \$10.75.

Pittsburg. Dec. 10.

(From Our Special Correspondent.)

Raw Iron and Steel.—Trade has been steady, but quiet, and a revival of activity appears to be conditional upon a more complete rupture or a closer agreement of the various pools. Buyers are holding off for the outcome of the discussions among the combination; but there is still general belief that trade will steadily increase in volume after the holidays. The tendency of business is toward gradual and healthful improvement, but some who had expected too much have been disappointed because the pace of trade betterment has not been as rapid as they expected. The season of the year is not propitious for an expansion of enterprise on a large scale, and new ventures are likely to be deferred to a considerable extent until after the new year. Good ground for confidence is also found in the abandonment of two of the largest combinations by which the iron industry has been retarded, and the possibility that two others will be abandoned in the near future; such a

state of things within so short a time after the election suggests that these organizations, formed when depressed business failed to support all the works in existence, are not expected to survive a general revival of ample demands for products.

Forty years ago the first Lake Superior ore was used in Mahoning Valley; it was brought to Youngstown in 1856. It consisted of 5,000 tons shipped from Cleveland in canal-boats; the ore cost \$6.50 per ton at Cleveland and the freight was \$1.65 per ton. It was used in the Falcon Furnace; furnace owners came from all directions to see it.

The wrought-iron pipe trade continues steady; some of the plants are running full, making from 100 to 150 tons a day. There is no change in prices; there are other plants that are not doing so well. In steel rails demand is restricted; the impression prevails that the next pool meeting will reduce prices, which causes buyers to hold off. Scrap iron is firm, sales light; holders in some cases refuse to accept present prices.

Latest.—The market ruled dull and prices were very irregular; yesterday Bessemer showed up very weak; sales were made at Valley furnace, January and February delivery, \$10.85@10.90, equal to Pittsburg delivery \$11.50@11.55. Bessemer furnaces are holding Bessemer at \$12@12.20. Gray forge is \$10.25@10.50, as per time of delivery of billets. The only sales were at \$19.50@20.25. The billet pool held a meeting, but refused to give any information. It is known that some of the members have withdrawn. We have had it from good authority that 30,000 tons sheet bars were sold, deliverable in the first four months of 1897, but could not learn the figures; also 9,000 tons billets by middlemen, who refused to give the figures. New Castle parties were the purchasers and \$19.75 was said to be the price.

Table with columns: COKE, SMELTED, LAKE AND NATIVE ORE, BLOOMS, BILLETS AND SLABS, Tons, Bessemer, Dec, Cash, etc.

Philadelphia. Dec. 11. (From our Special Correspondent.)

Pig Iron.—The increasing production of uncontracted for iron has had such an unsettling effect that two or three deals pretty well along were abruptly terminated. Our foundry and mill people, in the first place, have not picked up enough business to warrant them in buying iron.

Steel Billets.—Everything is unsettled. Some big buying has been done in a quiet way, but the news comes from outside parties. The question today is, what are billets worth? The era of low prices seems to be assured and our brokers say today there is nothing to stop big purchases right away. Our consumers want to have the stock in hand.

Merchant Bars.—The stores are selling more or less iron at fair margins to customers who usually buy more largely from mills at this time. The mill managers and their local representatives are scouring for business for after the holidays. The word from the car shops is that no rush is in sight.

Local mills are fairly busy. Valley mills must either make less iron or let it accumulate.

Skelp.—No news of interest. Manufacturers have made their best offers and are merely waiting.

Sheet.—To-day's reports all show that the mills have booked very little business this week. The store sales are above the average.

Pipes and Tubes.—Some long talked of business was partially secured to-day, which gives one of our largest plants a big run of work.

Merchant Steel.—Some local consumers have asked for bottom prices on a lot of steel.

Plate and Tank.—The actual business for the week was not over large, but things are taking shape for better business. There has been no actual drop in quotations. Buyers think there will be.

Structural Material.—We are all waiting to see the next move. Angles, 1'25; beams, 1'50.

Steel Rails.—Every day is looked to for some developments. People who are on the inside tell nothing, and there is no way to catch a point in advance of the combination's own action.

Old Rails.—Holders have done a great deal of going round to find prospective customers. They think they have several good strings to pull next month.

Scrap.—The very same words are true of heavy scrap. There is not much show for turnings and such stuff.

Cartagena, Spain. Nov. 25. (Special Report of Barrington & Holt.)

Iron and Manganiferous Ores.—There is a strong demand for ores and prices are advancing, especially for Bessemer qualities. A cargo of 20% manganiferous ore has been sold for France at 20 fr. per ton. Owing to the high freights only two cargoes were shipped in November, but tonnage is now easier; one charter, Cartagena to Middlesboro, has been made at 10s., but it is expected that shipping will be plentiful during December at a lower rate. Stocks are very heavy, but are mostly sold forward and shippers expect a heavy movement during the coming month. We quote for ordinary 50% Portland ore, 5s. 8d. @ 6s. 2d. per ton; special low phosphorus, 5s. 11d. @ 6s. 8d.; special ore, 7s. 2d.; specular ore, 60% iron, 9s. 3d. per ton. For manganiferous ores we quote: No. 1, 20% iron and 20% manganese, 15s. 8d.; No. 1 B, 25% iron and 17% manganese, 12s. 4d.; No. 2, 30% iron and 15% manganese, 11s. 4d.; No. 3, 35% iron and 13% manganese, 9s. 8d.; low grade, 38% iron and 10% manganese, 8s. 4d. per ton; all prices are f. o. b. shipping port.

METAL MARKET.

New York, Friday Evening, December 11th, 1896.

Gold and Silver.

Table with columns: December, St. Ex., London, N. Y. Cts., Value of sil. in \$., etc.

Silver has been in good demand, and all offerings have been promptly taken up. London has stubbornly fought against any advance in the price, but under pressure of an active December delivery demand has been compelled to advance the price to 30d.

The United States Assay Office in New York reports the total receipts of silver at 98,000 oz for the week.

Average Monthly Prices of Silver

in New York and London, per ounce Troy, from January 1st, 1896, and for the years 1895 and 1894.

Table with columns: Month, 1896, 1895, 1894, London, New York, etc.

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

Gold and Silver Exports and Imports.

At all United States ports, October, 1896, and years from January 1st, 1896 and 1895:

Table with columns: Coin and bullion, In ores, Total excess, Exp. or Imp., etc.

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

Gold and Silver Exports and Imports, New York

For the week ending December 11th, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

Table with columns: Gold, Silver, Total Excess, Exp. or Imp., etc.

Of the gold exported for the week, \$500 went to Central America, and the balance to the West Indies; of the silver the whole amount went to London. The gold and silver imported came from South America and the West Indies.

FINANCIAL NOTES OF THE WEEK.

The general course of business shows a slight improvement this week, although there is still some hesitation due to doubt as to the course of Congress. It is generally accepted that little or nothing will be done at the short session; but the talk of an extra session in March is disturbing, and many business men think it good policy to wait and see what may happen.

The Treasury gold reserve continues to show again, and the amount reported—\$133,096,996 this week—is very satisfactory. The New York banks show this week a slight decrease in specie, the amount of which very nearly corresponds to the Treasury gain. Some gold, however, has gone to interior banks this week.

The present conditions warrant the belief that there will be very little movement of gold either in or out for the remainder of the year. Whether there will be exports or imports in January depends upon conditions which may vary considerably in a month, so that any prediction is impossible.

Currency legislation is recommended in the President's message and in the report of the Comptroller of the Currency. The Currency Committee of the House of Representatives is also considering plans. There is no probability, however, that any action will be taken at the present session of Congress.

The executive committee in charge of the arrangements for the currency reform convention at Indianapolis has issued a call naming January 12th for the meeting. The convention is to be composed of representative men chosen from boards of trade, chambers of commerce, commercial clubs or other similar commercial bodies in cities of 8,000 or more inhabitants, according to the census of 1890. The call says:

"The business men have been accused of neglect of political duties; in ordinary times there may be some foundation for this charge, but at every critical juncture in the history of our country when the nation's perpetuity, honor or general welfare was seriously in danger, they have, in the spirit of enlightened patriotism, risen to the full measure of their duty, and we believe that the painful experience of the country under the existing laws on the subject of currency admonishes the business men that we have reached a point where it is their duty to take an active part in helping the great questions involved."

"Please appoint only those who will attend, and report the names of your delegates as soon as practicable to H. H. Hannab, Chairman of the Executive Committee, Indianapolis, Ind."

The call is signed by representatives of the boards of trade and commercial bodies in cities represented at the conference recently held in Indianapolis.

The Treasury statement showing the amount of money in the country on December 1st is as below:

Table with columns: Gold coin, Stand. silver dollars, Sub. silver, Gold certificates, Silver certificates, Treasury notes, U. S. notes, Currency certifi., Natl. Bank notes, etc.

Totals.....\$654,715,927 \$1,646,444,716 \$2,301,160,643

The increase shown in the amount in circulation was \$19,889,132, as compared with November 1st.

and \$52,249,267, as compared with December 1st, 1896. The estimated amount of circulation per capita was \$22.86 this year.

Specie shipments from San Francisco for the eleven months ending November 30th were as follows:

Table with columns for location (Hongkong, Shanghai, Japan, India, Central America, Honolulu, Mexico, Miscellaneous, New York) and amounts for 1895 and 1896.

The descriptions shipped this year were: Silver bars, \$5,037,358; Mexican dollars, \$5,313,797; Peruvian soles, \$140,867; United States coin, \$666,025; total silver, \$11,158,047. The gold was: Coin, \$11,537,604; bars and dust, \$46,581; total gold, \$11,584,185.

The statement of the United States Treasury on Thursday, December 10th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

Table with columns for item (Gold, Silver, Legal tenders, Treasury notes, etc.) and changes from Dec 3, Dec 10, and previous date.

Treasury deposits with national banks amounted to \$15,906,794, showing a decrease of \$97,679 during the week.

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$121,030,280. Against these are held in the Treasury 10,187,890 coined standard silver dollars, and silver bullion purchased at a cost of \$10,842,330, making a total of \$121,030,280.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending December 5th, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

Table with columns for item (Loans and discounts, Deposits, Circulation, Reserve, Specie, Legal tenders, Total reserve, Legal requirement, Surplus reserve) and values for 1894, 1895, and 1896.

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

Table with columns for bank name (Asso. Banks of New York, Bank of England, Bank of France, etc.) and specie holdings in Gold, Silver, and Total for 1895 and 1896.

The return for the Associated Banks of New York is of date December 5th; all the others are of December 10th, except the Bank of Italy, October 31st, and the Bank of Russia, October 16th-25th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Shipments of silver from London to the East for the year up to November 26th are reported by Messrs. Pixley & Abell's circular as below:

Table with columns for location (India, China, The Straits) and amounts for 1895 and 1896.

Arrivals for the week this year were £207,000 in bar silver from New York and £12,000 from the

West Indies, also £13,000 in Mexican dollars from New York and £7,000 from the West Indies; a total of £239,000. Shipments for the week this year were £137,000 in bar silver to Bombay, £15,000 to Calcutta and £7,200 to Hong Kong; also £32,760 in Mexican dollars to Penang; a total of £191,960.

Indian exchange has shown a considerable reaction, and light sales of Council bills were made at an average price of 15.06d. per rupee. The decline was due chiefly to reports of rain in India and consequently possible improvement in the crops.

Domestic and Foreign Coins.

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

Table with columns for coin type (Mexican dollars, Peruvian soles, Victoria sovereigns, etc.) and bid/asked prices.

Other Metals.

Copper.—The market has been very dull, and the business done was of a retail character. Manufacturers appear to be well supplied with raw material, and from Europe hardly any orders are coming in at present values. On the other hand, nothing can be bought cheap, first hands being well sold out, and are not willing to make concessions in price. The first shipment of 110 tons of foreign copper has arrived here from Southampton per steamer St. Paul, which sales we reported some time ago. Further lots are expected to arrive shortly. We have to quote lake copper, 11 1/2 @ 11 1/4 c.; electrolytic in cakes, wire bars or ingots at 11 c. @ 11 1/4 c., and cathodes, 10 1/2 @ 10 3/4 c. Casting copper remains as scarce as ever and commands very full prices, 10 1/2 @ 11 c., according to quantity and brand.

The London market has been rather dull, and quotations showed pretty large fluctuations. The market opened at £48 15s. @ £48 17s. 6d. for spot, then declined from day to day, and the lowest price was reached on December 9th, when some business was done at £48 5s., but after that a rather better demand set in, and the closing prices are £48 12s. 6d. @ £48 15s. for spot and £49 5s. @ £49 7s. 6d. for three months prompt.

Fine copper has not been in great demand, but values are fairly sustained, the quotations being: English tough, £51 10s. @ £52; best selected, £52 5s. @ £52 15s.; strong sheets, £50 @ £50 10s.; India sheets, £56 15s. @ £57 5s.; yellow metal, 1/2 d.

Tin.—There has been rather a lull, and transactions have not been as numerous by far as during the past few months. Besides, the lower quotations received from London influenced prices over here, and we have to quote spot and December tin 12 9/10 @ 13c., and futures 13 @ 13 1/4 c.

In London prices opened steady at £58 5s., but afterwards gave way somewhat, and closed at £57 17s. 6d. @ £58 for spot and 15s. higher for three months prompt. Shipments from the East for the year will probably show a slight falling off, which is offset, however, by the rather increased stocks in Europe.

Lead has been rather dull, and with not much disposition on the part of consumers to buy largely, prices have slightly given way. Since then, however, producers are holding back, and this prevented a further decline. We have to quote desilverized 3 @ 3 05c. and chemical 2 97 1/2 @ 3c. In St. Louis, business was not active, and the few sales made were at 2 75 @ 2 77 1/2 c. for desilverized and 2 72 1/2 c. for common.

Our cable from London reports the market to be dull, with Spanish lead quoted at £11 8s. 9d. @ £11 10s., and English 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead presents no novelty; the under current is very strong, but demand is light. Chemical lead is selling lightly at 2 70 @ 2 72 1/2 c.; Missouri brands, 2 75c.; corroding desilverized is worth 2 80c. Transactions are light, owing to indisposition on part of buyers to meet sellers' views.

Spanish Lead Market.—Messrs. Barrington & Holt write us from Cartagena, Spain, as below, under date of November 25th: Owing to high exchange and steady rise of prices abroad local quotations for pig lead have been advancing. To-day pig lead on wharf is quoted at 62 25 reales per quintal, the average price for November being 61 43 reales as against 58 94 reales for October. Silver is now paid for at the rate of 15 13 reales per ounce. For lead ore we quote: Pottery ore, 8s. 9d. per cwt.; Linareo sulphide, 6s. 8d.; Linareo carbonate, 4s. 4d.; all prices f. o. b. shipping port. Exports of pig lead for November were: To Marseilles, 1,902,044 kilos; Certe, 30,000 kilos; United Kingdom, 2,918,845 kilos; Antwerp, 380,979 kilos; total, 5,237,868 kilos. We also note exports of 63 tons galena to Marseilles, and 23 tons of the same mineral to Antwerp.

Spelter.—The market has been rather irregular, and the demand for spot and nearby delivery having fallen off somewhat, prices have also suffered to a slight extent. Consumers are very reluctant to lay in heavier supplies at present high prices. We have still to quote a 15 @ 4 20c., delivered in New York.

In London good ordinaries are quoted £17 13s. 9d. @ £17 16s. 3d., and specials 2s. 6d. more.

Antimony remains dull, but somewhat higher prices are asked for all descriptions. We have to

advance quotations for Cookson's to 7 1/4 c.; U. S. Star, 7 @ 7 1/4 c., and Hallet's at 6 1/4 c.

Aluminum.—The Pittsburg Reduction Company announces a reduction in prices varying from 5c. to 7c. per lb. The new scale is as follows, the prices named being respectively for ton lots, for 100 lbs. or over and for small lots: No. 1, guaranteed over 98% pure, in ingots for remelting, 37c., 39c. and 42c.; No. 2, over 90% pure, in ingots for remelting, 31c., 33c. and 34c.; nickel-aluminum casting metal (aluminum alloyed with 10% nickel), 35c., 38c. and 40c.; special casting alloy, over 80% aluminum, used in place of brass, 37c., 39c. and 35c.; aluminum castings, 45c. per lb. up. Aluminum sheets are 56c. per lb. up to \$2.90, according to thickness and size of sheets. Wire is 55c. @ \$4.80 per lb., according to gage. Rolled rods, from 1/2 in. to 1 in. in diameter are 53c. per lb. Bars, round or square, 7c., with special discounts on large orders.

Nickel.—Sales have been fair, and prices are unchanged. We quote for ton lots 33 @ 36c. per lb., with 37 @ 39c. for smaller orders. London prices are steady at 14 @ 15d. for large orders and 15 @ 16 1/4 d. for small lots. The New York price is about on a parity with London, allowance being made for the duty of 6c. per lb. here. The Paris quotation is 4 fr. per kilo, equivalent to about 36c. per lb.

Platinum.—Demand is steady and prices are firm at \$14.50 @ \$15.50 per oz., New York. London quotations are 57s. 6d. @ 59s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotations, the prices given being respectively for orders of over 250 grams, for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 50c., 51c. and 52c. per gram. Wire and foil are 47c., 48c. and 49c. per gram. The current retail price for crucibles is 60c. per gram.

Quicksilver.—The New York quotation is unchanged at \$36.75 per flask. The London price is £6 12s. 6d. per flask, with £8 10s. @ £8 10s. 6d. named from second hand.

The Minor Metals.—Quotations for these metals are given in the table below, the prices being for New York delivery:

Table listing prices for Aluminum, Tin, and Iron in various forms (No. 1 pure ingots, scrap, casting metal, etc.) with prices per lb. or per oz.

Average Monthly Prices of Metals

In New York since January 1st, 1896, and for the years 1895, 1894, 1893 and 1892; in cents per pound.

Large table with columns for Month, Year (1896, 1895, 1894, 1893, 1892), and rows for Copper (Lake), Tin, Lead, and Spelter.

Imports and Exports of Metals.

New York.*	Week, Dec. 3.		Year, 1896.	
	Expts.	Impts.	Expts.	Impts.
Aluminum..... lbs.			10,000	2,010
Antimony ore..... short tons			10,000	2,510
regulus, casks		141		2,293
Brass, old..... short tons			269	
Copper, fine..... long tons	1,870	45	68,853	4,487
" " " " " "			16,226	1,281
" " " " " "	410			4,592
" " " " " "			1,498	
" " " " " "				2,997
Iron ore.....			2,431	51,573
" " " " " "				4,660
" " " " " "				2,298
" " " " " "				890
" " " " " "				7,325
" " " " " "				23,495
" " " " " "			14,375	36,699
" " " " " "	290	54	14,635	36,753
" " " " " "				126
" " " " " "			10	763
" " " " " "				40
" " " " " "			122	22,448
" " " " " "			75	727
" " " " " "				714,913
" " " " " "				761,031
" " " " " "				2,564
" " " " " "				52

* Metal Exchange Reports. † Week ending Dec. 10.

Baltimore.**	Week, Dec. 10.		Year, 1896.	
	Exp.	Imp.	Exp.	Imp.
Bismuth metal, cases..... long tons				52
Chromite ore..... long tons				4,802
Copper, fine.....	119		33,087	
" " " " " "				500
" " " " " "	19		2,539	
Iron ore.....		5,806		333,379
" " " " " "				820
" " " " " "				100
" " " " " "				150
" " " " " "				775
" " " " " "				1,530
" " " " " "				73
" " " " " "				4,219
" " " " " "				220
" " " " " "				2,749
" " " " " "				42
" " " " " "				9,659
" " " " " "				410
" " " " " "				932
" " " " " "				145
" " " " " "				10,775
" " " " " "				2,661
" " " " " "				581
" " " " " "				219
" " " " " "				132,115
" " " " " "				796

**From our special correspondent.

Philadelphia.††	Imports.	
	Week, Nov. 21.	Year, 1896.
Antimony, casks.....		102
Copper ore, long tons.....		15,710
Ferro-manganese, long tons.....		877
Ferro-silicon.....		535
Iron ore, long tons.....		234,582
" " " " " "		650
" " " " " "		7,051
" " " " " "	1,233	5,798
" " " " " "		618
" " " " " "		12,914
" " " " " "		25
" " " " " "		501
" " " " " "		725
" " " " " "		49,891

†† From New York Metal Exchange Reports.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Dec. 11.
Heavy Chemicals.—This market is reported to be very quiet throughout, but no change has occurred in any of the prices. Bleaching powder remains scarce and is in good demand. For 1897 delivery, caustic soda, in 1,000-ton lots and over is quoted at 2c. per pound. Alkali, in bags, in equally large contracts for 1897 delivery is 70c. per 100 lbs. We quote: Caustic soda, 60%, \$2.22½@ \$2.42½; 70, 74@75c., \$2.12½@ \$2.22½ per 100 lbs. Alkali, 58%, 70@75c. for 50-ton lots and over, and 80@90c. for smaller quantities; 48%, \$1@ \$1.10 for jobbing lots. Bleaching powder, prime brands, \$1.75@ \$1.87½; Continental, \$1.62½@ \$1.75 per 100 lbs. Bicarb. soda, English, 1.75@ 2c. per lb.; American, bulk, \$1.50@ \$3.50 per 100 lbs., according to make. Sal-soda, English, 62½@ 67½c.; American, 65c. (in barrels), 80c. (in kegs) per 100 lbs. Hyposulphite of soda, prime white German, 1.65@ 1.85c. in casks; 1.75@ 2c. in kegs.

Acids.—The acid market remains quiet, but firm. Most of the business doing still consists of contracts for 1897. Acids delivered in truck-load lots is quoted at 1@ 1½c. above the figures given below: Quotations per 100 lbs. in New York and vicinity in lots of 50 carboys or over are as follows: Acetic acid (in barrels), \$1.35@ \$1.45; in carboys, \$1.40@ \$1.60; muriatic acid, 18°, 75c.; 20°, 75@ 85c.; 22°, \$1.10 @ \$1.25, according to make and quantity. Nitric acid, 36°, \$3.25@ \$4.36; 40°, \$4@ \$4.50; 42°, \$4.50 @ \$5.50. Oxalic acid, \$7.25 ex-dock and \$7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66°, 75@ 90c. per 100 lbs., 10@ 15c. higher for small quantities. Chamber acid, \$6@ \$6.50 per ton at factory. Blue vitriol, \$3.50@ \$3.75 according to grade and order.

Brimstone.—Business in brimstone is very quiet at present, though the market price is maintained strong. Arrivals continue small because of the high ocean freight rates to this country from ship-

ping ports in Sicily. Best unmixed seconds, for shipment, are quoted at \$22½ per ton.

We referred last week to the issue of bonds by the United States Sulphur & Chemical Company, of New York and Texas. We are informed that subscriptions to these bonds are being received by Mr. D. Wallerstein at No. 32 Spruce street, New York.

Fertilizing Chemicals.—The market has been quiet and heavy, as there has been little demand. The receipt of cattle and hogs through the West continues small, as reported last week. Prices still have a downward tendency, as the following quotations show:

Sulphate of ammonia, gas liquor, \$2.10@ \$2.12½ for shipment, and \$2.17½ on spot; bone, \$2. per 100 lbs. Dried blood, high grade Western, \$1.80 per unit New York; f. o. b. Chicago, \$1.50@ \$1.55 per unit; low grade, fine ground, Western, \$1.45@ \$1.50 f. o. b. Chicago. Azotine, \$1.75 basis New York. Concentrated phosphate (30% available phosphoric acid), 57½c. per unit. Acid phosphate, 13% @ 15%, av. P₂O₅, 54@ 65c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P₂O₅, 85c. per unit. Acidulated fish scrap, \$10, and dried scrap \$19.50@ \$20 f. o. b. fish factory. Tankage, high grade, \$15@ \$15.50 per ton; concentrated, \$1.50 per unit f. o. b. Chicago; New York, \$19.75@ \$20.50; low grade, \$19. Bone tankage, \$19@ \$20; ground bone, \$21@ \$23. Bonemeal, \$20@ \$22.50.

Sulphate of Potash: 90-95%, New York and Boston, \$1.96½; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 1.03@ 1.05½c. basis of 48% chlorate high grade (basis 90%), 1.99½@ 2.03c., in bulk, 24@ 36c. per unit O. P., 36½@ 38c.

Muriate of Potash: We quote: 1.78c. at New York and Boston, 1.79½c. Philadelphia, Baltimore and Norfolk, and 1.81½c. Charleston, Savannah, Wilmington and New Orleans, for 80@ 85% basis of 80%, in lots of 50 tons and upwards.

Chlorate of Potash.—Private advices received state that the Swedish factory manufacturing this substance has been completely destroyed by fire. It will take some time before it can be rebuilt and again place its product on the market. The removal of this competitor has increased prices, which are 8@ 8½c., according to quantity.

Kainit.—Quotations per ton of 2,000 lbs. are \$8.80 @ \$9.25 per ton for shipments; the same for bulk, ex-ship.

Nitrate of Soda.—General business at this time is said to be rather quiet, though prices have an upward tendency. For spot we quote 1.92½@ 1.95c.; for shipment in the near future, 1.90c., and for January and February, 1.87½c.

Liverpool. Dec. 2.

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

There is not much going on in chemicals this week, but the market is steady all round, and in some cases prices show a slight improvement.

Soda ash is quiet and quotations are practically unchanged. The nominal spot range for tierces, as to market, is about as follows: Leblanc ash, 48%, £4@ £4 5s. per ton; 58%, £4 5s. @ £4 10s. per ton, net cash; ammonia ash, 48%, £3@ £3 10s. per ton; 58%, £3 5s. @ £3 15s. per ton, net cash. Bags 5s. per ton under price for tierces.

Soda crystals are rather inactive, at £2 5s. @ £2 7s. 6d. per ton, less 5% for barrels, and 7s. less for bags. Caustic soda is in a strong position at present, especially for outside makes, for which advanced prices have been paid. We quote range, as to market, either prompt or forward delivery, as follows: 60%, £6 5s. @ £6 10s. per ton; 70%, £7 5s. @ £7 10s. per ton, net cash; 74%, £8 2s. 6d. @ £8 5s. per ton; 76%, £8 15s. @ £9 per ton, net cash.

Bleaching powder is firm, at £6 12s. 6d. @ £6 17s. 6d. per ton, net cash, for hard wood packages, as to destination.

Chlorate of potash is well maintained at 4d. per lb. for any position, but demand has rather fallen off again.

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

Sulphate of ammonia is dull and a shade lower at £7 15s. @ £7 17s. 6d. per ton, less 2½% for good gray, 24% and 25% in double bags f. o. b. here, as to quality.

Nitrate of soda is in poor demand, at £8 2s. 6d. @ £8 7s. 6d. per ton, less 2½% for double bags, f. o. b. here, as to quality.

Carb. ammonia, lump, 3d. per lb.; powdered, 3¼d. per lb., less 2½%.

Valparaiso, Chile. Oct. 24.

(Special Report of Jackson Brothers.)

Nitrate of Soda.—A little more activity has been displayed in this article during the past fortnight, owing to a momentary improvement in prices which took place in consuming markets on October 16th, after the Combination Committee had declared officially that all producers could ship after April 1st, 1897, any part of their present quota for the year ending March 31st, 1897, without affecting their next year's quota. The rise, however, was of short duration and the market soon collapsed into its former apathy. Producers' position is strengthened by the above determination, and they are now less than ever inclined to lower their selling limits. We quote, 95%, October to November delivery, 5s. 11d. @ 6s., and 96%, 6s. 1d., sellers. The price of 5s. 11d. with 16s. 6d. freight, stands in 7s. 4¼d. per cwt., net cost and freight, without purchasing commission.

Sales for the fortnight amounted to 446,500 metric quintals.

MINING STOCKS.

Complete quotations will be found on pages 551 and 555 of mining stocks listed and dealt in at: New York, Colorado Springs, Paris, France, Boston, Duluth, Minn., Mexico, Philadelphia, Helena, Mont., Shanghai, China, Baltimore, Salt Lake, Utah, Valparaiso, Chile, Pittsburgh, San Francisco, London, England, Cleveland, page 372 Denver, Colo., British Columbia.

NEW YORK, Friday Evening, Dec. 11.
 Although there were 14,000 shares traded in during the past week as compared with 11,930 for the preceding week, interest in the mining stock market has continued to decrease.

The main features of the market this week are the strength of Bulwer Consolidated and the decrease in prices of the Comstock companies.

The Colorado stocks, especially the Cripple Creek contingent, have continued to absorb most of the speculation, and we note sales of the following stocks: Alamo, at '05; Anaconda, at \$1.15@ \$1.10; Creede and Cripple Creek, at '07; Cripple Creek Cons., at 14@ 15c.; Croesus, at '02; Mt. Rosa, at 15c.; Pharmacist, at 15c.

Of the California stocks Brunswick Consolidated has ruled steady at 20@ 23c., which no doubt was caused by the favorable news of the finding of a body of ore in the 900 ft. level which shows free gold; Bulwer Consolidated shows one sale of 200 shares at 43c.; Standard Consolidated was also traded in during the week.

Dealings in the Comstocks during the past week show an increase over the preceding week, although as mentioned above, lower prices have ruled. Consolidated California & Virginia, which opened at \$1.65 on December 5th, declined to \$1.10 on the 9th, on sales of 250 shares. Gould & Curry shows a net loss of 10c. during the week. Mexican continued to decline since our last report and sold at 46c. for 100 shares. Yellow Jacket also suffered during the week, opening at 33c. and closing at 27c. on sales of 300 shares.

Utah had one representative in Ontario which shows sales of 50 shares at \$10.50.

Kingston & Pembroke, the iron ore stock of Canada, appears with sales of 200 shares at 34c.

Boston. Dec. 10.

(From Our Special Correspondent.)

The market for copper stocks has been heavy all the week, with prices from ½% to \$5 lower. The interest has centered largely in the Montana stocks, the greatest decline being in Boston & Montana, which early in the week sold up to \$93½, declined to \$88½ on heavy selling by inside parties, rallying to 91½ and closing at 91¼. In point of activity Butte & Boston was the speculative leader, with sales of about 23,000 shares, advancing from \$6½ to 7½, but losing it all in later sales, closing at \$6½ to-day. Old Dominion has ruled steady, selling up to \$18 and receding to \$17 in the last sales. The dealings were very light.

The lake stocks have been very quiet, with a lower tendency. Calumet & Hecla declined from \$325 to \$320 on small sales. Quincy touched \$120, but later declined to \$118. The scrip was firm at about \$95. The Tamarack directors declared a dividend of \$3 per share, making \$6 for the present year. The stock sold at \$95, dividend on, and later \$92 ex-dividend, with later sale of a small lot at \$93. Osceola sold at \$30, and declined later to \$29½. Kearsarge was quite active, selling up to \$17 early in the week; later it declined to \$15½ and recovered to \$16. Franklin sold at \$12, a gain of \$1 over last sales. Atlantic sold at \$21, declined to \$20½, closing at former figure. Tamarack, Jr., declined from \$15 to \$14, closing at \$14½. Tecumseh declined from \$3¾ to \$3, and Arnold sold at 40c. and 30c. Wolverine was one of the firmest stocks on the list, advancing from \$8½ to \$9½, closing firm at \$9; about 3,000 shares were traded in.

The gold-mining 'stocks were extremely dull. About 500 shares of Pioneer were sold at \$5½@ \$5½. About 200 shares Santa Ysabel sold at \$11½@ \$11½, and about 300 Merced at \$7½@ \$7. Gold Coins was strong on favorable reports, and advanced on small sales from \$3 to \$3.20.

Cleveland. Dec. 9.

(From Our Special Correspondent.)

No sales of consequence were made in mining stocks listed here during the past week. There was a little trading, but it was small, and simply indicated that investors were waiting until the officials of the companies had made a declaration regarding their intentions during the next year. The only change in quotations was made in Cleveland-Cliffs iron, a slight decline. The stocks are quoted as follows:

Name of Company.	Par val.	Dec. 9.	
		Bid.	Ask.
Aurora.....	\$25	\$6.00	\$8.00
Biwabik.....	100	34.00	34.00
Champion Iron Company.....	100	10.00	30.00
Chandler.....	25	10.00	13.50
Cincinnati Iron.....	25	40.00	45.00
Cleveland-Cliffs Iron Company.....	25	70.00	75.00
Jackson Iron Company.....	25	25.00	25.00
Lake Superior Iron Company.....	100	21.00	21.00
Lake Superior Consolidated.....	100	66.00	66.00
Minnesota.....	25	73.00	73.00
Pittsburg & Lake Anzeline.....	25	16.00	16.00
Republic Iron Company.....	25	16.00	16.00

Salt Lake City. Dec. 5.

(Special Report of James A. Pollock.)

The market this week was dull, but steady. Prices held well, but stocks failed to maintain their buoyancy of last week. Trading was limited, with no material change in quotations. There was a demand for Ajax, and the stock took another jump, closing strong in the immediate neighborhood of 80c., with indications of a further raise. Anchor showed some activity, but at shaded figures. While there was no special change in Bullion-Beck, the stock continued strong. Bogan was without feature. The Centennial-Eureka is maintaining its usual shipment record, and on December 15th the company will pay the regular double dividend of \$1 per share. No stock is on the market. Dalton showed some improvements in price, the result of a little more inquiry and the receipt of a small shipment of ore sent out by the lessees. There is still nothing from the Daly regarding dividends. The stock was slightly weaker, although the offerings have not been heavy. Daly-West was in good demand, but the repeated bids did not bring out much stock. At the properties of the East Golden Gate operations are not being rushed just at present, the drill having given the operators more trouble. The stock was without strength. Four Aces was somewhat stronger, and did considerable business. Geyser was unchanged. The mill installation is about complete, and with this accomplished the company will have a daily capacity of 100 tons. Horn Silver was without activity again. Lucky Bill showed more business than for some weeks past, and recorded sales at higher figures than have ruled for months. Mercur continued to make a splendid record of production. Two or three small blocks of the stock were sold at slightly reduced prices, but the general market remained practically unchanged. It is expected that the Mammoth's shaft improvements will be completed within the next six weeks, when shipments will be pushed again. Northern Light was in good demand at the ruling figures. Ontario has paid its usual dividend. The stock was heavy and recorded no change. Rever was in slightly better demand. The Sacramento has declared a dividend of 1/2c. per share, payable December 15th. Some heavy blocks of the stock came out at 50c., but with the close came a shading to 40c., and thereabouts. Swansea will pay a dividend of 5c. per share December 10th. The stock did not change much, but continued in fair demand. South Swansea closed at last week's figures, the stock having been active only at the opening. Sunshine was practically unchanged. Utah is having a perceptible increase in its gold values as greater depth is attained. The company will not pay its usual dividend this month.

San Francisco. Dec. 5.

(From Our Special Correspondent.)

The market opened as quietly as usual on Monday, and very little was done; on Tuesday, however, there was more activity and a considerable break in the Brunswick lode stocks. These continued to drop through the week, but made a slight upward reaction at the close. The excitement was very moderate and it was an insiders' market all the way through.

The important news of the week is that the Hale & Norcross Company has given 30 days' notice of its withdrawal from the joint workings on the Brunswick lode. Nothing has been found, the directors say, and they do not believe it is any use to put more money in.

Some closing quotations are: Chollar, \$1.70@1.80; Consolidated California & Virginia, \$1.55; Ophir, \$1.10@1.15; Hale & Norcross, \$1; Bodie Consolidated, 52c.; Bulwer, 40c.

Dealings on the Gold Mining Exchange were light and there were few variations. Savannah is quoted 45@46c.; Lockwood, 26@27c.

The sales on regular call at the San Francisco Stock Board for the first 11 months of the year were as follows:

Table with 3 columns: Month, 1895, 1896. Rows: January, February, March, April, May, June, July, August, September, October, November, Total.

For the same time in 1894 the sales were 3,722,065 shares.

The Morning Star Mining Company, of Iowa Hill, Cal., has declared another dividend at the rate of \$3 per share.

The Overman Mining Company has levied an assessment of 10c. per share, delinquent December 31st.

The Red Cloud Mill and Mining Company, of Douglas County, Nev., has levied an assessment of 2c. per share, delinquent December 31st.

British Columbia.

(From Our Special Correspondent.)

ROSSLAND, B. C., Dec. 3.

For the first time since mining stocks of Trail Creek properties were put on the market there has been a general reduction in the quotations, which is also accompanied by a dull local market. This decline has no serious feature connected with it. The weather has been extremely cold. Develop-

ment work in this camp has been materially interrupted in consequence, but those who understand the situation best regard this dullness as temporary and very much due to the season. In addition to this a few propositions were exploited very late in the fall, while there has been a very energetic attempt to boom them, and the quotations given to the local press have, perhaps, been published a little higher than the actual figures, under the impression that such a course was of assistance, though unquestionably it has been an injury. The buoyant feeling with regard to the future of the Kootenay country continues unabated. The business men of the camp have begun to organize for systematic efforts. A board of trade has been formed, and a mining exchange will probably be perfected with the return of spring.

London. Nov. 28.

(From Our Special Correspondent.)

The mining stock market has fluctuated considerably during the past week, though the average activity has been very low. In the South African section considerable depression has been caused by continental selling, while at the same time the announcement by the Chartered Company that the new issue of 500,000 shares at £2 each has been more than fully subscribed has caused bears to scramble in and buy back. This Chartered has risen in price and most South Africans have followed. The fortnightly settlement, which was arranged this week, showed the existence of very few accounts, and on the whole prices were slightly lower than a fortnight ago. An unpleasant feature of the week has been the news of the closing down of Langlaagte Royal (not the great mine of a similar name). This mine belongs to the Barnato group, and its misfortunes have reflected somewhat on the others of the same group. Langlaagte Royal has never been a successful mine owing to the irregularity of the deposits, and a year ago a large sum of money was spent in providing additional stamps so as to increase the output, but this policy has evidently been a failure.

The West Australian market has been rather brisker than usual, owing to the publication of some favorable returns from the mines. The most prominent of these has been Lake View, regarding which Mr. Kaufmann, the engineer, has sent a very glowing report. An interesting feature at this mine is the occurrence of telluride ore in large enough quantities to pay to ship to Swansea.

An arrangement has been made between the great promoting companies, viz., the "London and Paris" and the "London and Globe," both of which have large dealings in West Australia, South Africa and elsewhere. The former is controlled by Barnato and the latter by Whitaker Wright, and this is the first occasion when these two interests have joined, so that the developments will be interesting.

At present the dealings in American mines are almost entirely confined to the Exploration Company. It is stated that this company has acquired the Tomboy in Colorado, and that some very large properties on the Mother Lode of California are being examined for the company. Small mines or prospects stand no chance in London at present, but there seems to be plenty of opening for fully developed mines which are in operation and have great reserves.

Paris. Nov. 29.

(From Our Special Correspondent.)

As for some time past the metallurgical shares continue the strongest point in the market. Its weakest is found in the South African gold stocks, which are still in a very uncertain condition. The news from the Transvaal does not tend to encourage holders, since it is evident that the gold mining industry is passing through a serious crisis at the present time.

The Cape Copper Company has announced a dividend of 3/75 fr. on the ordinary shares, which has naturally helped to improve the position of all the copper stocks, as well as of this special company. Otherwise their prospects do not seem to encourage any considerable increase over present prices, and perhaps a fall may be looked for in view of the heavy production of the metal.

The Ministry of Commerce reports as below the movement of gold and silver in France for the 10 months ending November 30th:

Table with 4 columns: Year, Imports, Exports, Excess. Rows: GOLD (1895, 1896), SILVER (1895, 1896).

Imports of small copper and nickel coins this year show a face value of 104,400 fr., while the exports amounted to 374,400 fr., showing an excess of 270,000 fr. in exports.

The position of Spain is beginning to cause a great deal of anxiety here. The troubles in the Philippines are greater than most people here understand. As to Cuba, while most people here are not especially anxious to see the power of the United States increased, there would be little regret if the international scandal involved in the present condition of the island should be removed by its transfer to you.

MEETINGS.

Andes Silver Mining Company, at 309 Montgomery street (room 22), San Francisco, Cal., on December 18th, at 1 p. m.

Annie Consolidated Mining Company, at the office of the company in Eureka, Utah, on December 19th.

Consolidated Coal Company, at 44 South street Baltimore, Md., on December 14th, at 12 m.

Gould & Curry Silver Mining Company, 309 Montgomery street (room 69), San Francisco, Cal., on December 21st, at 1 p. m.

New York Mining and Smelting Company, in McCormick Building (room 507), Salt Lake City, Utah on December 12th, at 2 p. m.

ASSESSMENTS.

Table with 5 columns: Name of Co., Loc'n., No., Dinq., Sale, Amt. Rows: Bay State, Buckeye, Comstock Silver, Elk Mountain, Exchequer, Far West G. & S., Flint Creek, Gibraltar Con., Gold Valley, Govern, Horseshoe Bar Con., Last Chance, Montreal, Morning Star, Mt. Diablo, No. Golden Gate, North Gould & Curry G. & S., Occidental Con., Red Cloud, Silver King, Snowflake, Wm. Tell Con Gold.

* New assessment.

DIVIDENDS.

Table with 4 columns: NAME OF COMPANY, Current Dividends (Date, Amt.), Paid since Jan. 1, 1896, Total to date. Rows: Aetna Con., Alaska-Mexican, Alaska Treadwell, Anaconda, Anchoria-Leland, Aurora Iron, Bangkok-Cora Bell, Big Six, Boston & Mont., Bullion-Beck & Ch., Calumet & Hecla, Cariboo, Centennial-Eureka, C. O. D., Coronas, Dalton & Lark, Daly, Deadwood Terra, De Lamar, Dominion Coal, Elkhon Con., Florence, Galena, Garfield Grouse, Gold Coin, Golden Eagle, Golden Fleece, Gold & Globe Hill, Hecla Con., Helena & Frisco, Highland, Homestake, Hope, Horn Silver, Iowa, Iron Mountain, Isabella, Jackson, Last Chance, Le Roi, Mammoth, Mercur, Minnesota Iron, Mont. Ore Pur. Co., Moon-Anchor, Moose, Mt. Rosa, Napa Con, New Elkhorn, Ontario, Osceola Con., Ottaqueachy, Pan American, Portland, Quincy, Sacramento, Silver King, Slocan Star, Small Hopes, Smuggler-Union, Swansea, Tamarack, Union, Utah, Utah Con., Victor M. & L., War Eagle, Wasp.

* November dividend paid.

NOTE.—This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information. Readers of the Engineering and Mining Journal will confer a favor on the publishers if they will notify the Journal of any errors or omissions in the above table.

STOCK QUOTATIONS.

BOSTON, MASS.

Table of stock quotations for Boston, Mass. with columns for Name of Company, Location, Par value, and prices for Dec 4, 5, 7, 8, 9, 10.

*Official quotations Boston Stock Exchange. † Ex-Dividend. Total sales, 48,560.

NEW YORK.

Table of stock quotations for New York with columns for Name of Company, Location, Par value, and prices for Dec 5, 7, 8, 9, 10, 11.

*Official quotations N.Y. Stock and Con. Stock & Petroleum Exchs. Total shares sold, 14,000.

INDUSTRIAL COAL AND COAL RAILROAD.

Table of stock quotations for Industrial Coal and Coal Railroad with columns for Name of Company, Par value, and prices for Dec 5, 7, 8, 9, 10, 11.

*Official quotations N.Y. Stock Exchange. Total shares sold, 181,500.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo. with columns for Name of Company, Par value, and prices for Nov 30, Dec 1, 2, 3, 4, 5.

* Official quotations and sales Colo. Springs Mg. Stock Assoc. * Board of Trade Exchange.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, Cal. with columns for Name of Company, Location, Par value, and prices for Dec 5, 7, 8, 9, 10.

*Official telegraphic quotations, San Francisco Stock Exchange.

BALTIMORE, MD. Week ending Dec. 10.

Table of stock quotations for Baltimore, Md. with columns for Name of Company, Location, Par value, Bid, Ask, and prices.

*Official quotations Baltimore Stock Exchange.

BRITISH COLUMBIA. Week ending Dec. 5.

Table of stock quotations for British Columbia with columns for Name, Selling price, and prices for Dec 5.

Par val.: Hall Mines and Le Ref, \$5; Slocan Star, 50c; other stocks, \$1.

LONDON.

Nov. 27.

Table of company stock prices in London, including columns for Name of Company, Country, Product, Capital Stock, Par Value, Last Dividend, and Quotations.

DENVER, COLO.

Table of company stock prices in Denver, Colorado, including columns for Name of Company, Par Value, and various price points for different dates.

PARIS. Week ending Nov. 20.

Table of company stock prices in Paris, including columns for Name of Company, Country, Product, Capital Stock, Par Value, Dividend, and Prices.

MEXICO. Week ending Dec. 3.

Table of company stock prices in Mexico, including columns for Name of Company, State, No. of Shares, Last Dividend, and Prices.

VALPARAISO, CHILE. Sept. 24.

Table of company stock prices in Valparaiso, Chile, including columns for Name of Company, Capital, Share Value, Last Dividend, and Prices.

SHANGHAI, CHINA. Nov. 8.

Table of company stock prices in Shanghai, China, including columns for Name of Company, Country, No. of Shares, Value, Last Dividend, and Price.

SALT LAKE CITY, UTAH. Week ending Dec. 5.

Table of company stock prices in Salt Lake City, Utah, including columns for Stocks, Par Value, Bid, Asked, and Actual Selling Price.

PHILADELPHIA PA. Week ending Nov. 27.

Table of company stock prices in Philadelphia, PA, including columns for Name of Company, Location, Par Value, Bid, Asked, and Price.

HELENA, MONT. Week ending Nov. 27.

Table of company stock prices in Helena, Montana, including columns for Name of Company, Location, Par Value, Bid, Asked, and Price.

PITTSBURG, PA. Week ending Dec. 5.

Table of company stock prices in Pittsburgh, PA, including columns for Name of Company, Location, Par Value, Bid, Asked, and Price.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and Amount of Last. Includes 130 entries for dividend-paying mines and 130 entries for non-dividend-paying mines.

G. Gold. S. Silver. L. Lead. C. Copper. B. Borax. * Non-assessable. + The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. † Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends and the Cons. Virginia \$42,300,000. ‡ Dividends paid since consolidation. NOTE.—Corrections to this table are made monthly. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

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Engineers, Chemists, Metallurgists.
 See Directory Pages 4, 5 and 6.

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Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE, whether subscribers or not.

The labor and expense involved in ascertaining what positions are open, in gratuitously advertising them and in attending to the correspondence of applicants, are incurred in the interest and for the exclusive benefit of subscribers to the ENGINEERING AND MINING JOURNAL.

Applicants should inclose the necessary postage to insure the forwarding of their letters.

1492 WANTED—A YOUNG MAN WHO is competent as an analytical chemist, with some experience as an engineer, can find a situation at a moderate salary with a mining company in Virginia, by furnishing satisfactory testimonials of his character, ability and experience. Address MINING COMPANY, ENGINEERING AND MINING JOURNAL, Sept. 26.

1496 WANTED—A TECHNICAL AND practical mining engineer, assistant to superintendent. Should have mechanical ability. State age, experience and salary expected. Address CONSOLIDATED, ENGINEERING AND MINING JOURNAL, Nov. 14.

1497 WANTED—A ASSAYER AND Draughtsman. Position open West for an energetic, technical graduate, as assistant engineer to manager. Great variety of work outside and in office. Give references, age and experience. Address L. G., ENGINEERING AND MINING JOURNAL, Nov. 14.

1498 WANTED—A MINE FOREMAN, about 35 years of age, for gold quartz mining in Ontario, Canada, who has had experience in mining narrow quartz veins; must have the best of references. State age, experience, references and salary expected. Address G. O. L. D., ENGINEERING AND MINING JOURNAL, Nov. 28.

1500 WANTED—YOUNG MAN TO LOOK after mining interests. Should have experience in mining and be familiar with the chlorination and cyanide processes. Must be of good standing, thoroughly reliable, and have good judgment. Best references required. Address RELIABLE, ENGINEERING AND MINING JOURNAL, Dec. 5.

1501 WANTED—CHEMIST AND ASSAYER with experience in bookkeeping. Position open for an energetic young man as assistant to manager. Give references, age and salary expected. Address LIBERTAD, ENGINEERING AND MINING JOURNAL, Dec. 12.

1502 WANTED—CHEMIST FOR BLAST-furnace business; must be thoroughly competent and well recommended. State experience, etc. Address PIG IRON, ENGINEERING AND MINING JOURNAL, Dec. 12.

1503 WANTED—AN EXPERIENCED metallurgist and chemist as superintendent of a lead, silver and gold smelting works, located in the Middle States; must be alive and energetic, and thoroughly qualified and experienced in modern blast furnace practice and refining; a good position to the right party; answer with references. Address MAHNET, ENGINEERING AND MINING JOURNAL, Dec. 12.

1504 WANTED—THOROUGHLY COMPETENT manager for a Gas Company in city of 50,000 people; good plant, but needs pushing; give full particulars as to experience, abilities, reference and remuneration—part of latter must depend on results; no attention unless compliance with terms. Address GAS, ENGINEERING AND MINING JOURNAL, Dec. 12.

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CHEMIST AND ASSAYER NOW IN MEXICO desires position. A Spanish-speaking country preferred. Capable of assuming position of assistant superintendent of small lead-silver blast furnaces. Address W., ENGINEERING AND MINING JOURNAL, No. 17,890, Feb. 18.

MINING ENGINEER, CHEMIST AND ASSAYER, graduate of Michigan Mining School, good references, practical miner desires position. Address M. M. S., ENGINEERING AND MINING JOURNAL, No. 17,876, Dec. 19.

STUDENT WITH FIVE YEARS' EXPERIENCE in mining, smelting and analytical work—assaying—desires a position. Spanish spoken. Address OBSERVER, ENGINEERING AND MINING JOURNAL, No. 17,889, Jan. 2.

MINING ENGINEER AND METALLURGIST would like position in charge of cyanide plant, or as assistant to superintendent of mining or smelting company. Address B. M., ENGINEERING AND MINING JOURNAL, No. 17,890, Jan. 16.

CIVIL AND MINING ENGINEER WANTS position as assistant engineer to manager or other position of trust. Age 34 years. Twelve years' experience in railroad and mining engineering. Unquestionable references as to habits, ability and character. Now employed by one of the largest companies in Mexico. Correspondence solicited. Address L. C., ENGINEERING AND MINING JOURNAL, No. 17,887, Dec. 19.

A MECHANICAL ENGINEER, 34 YEARS of age, who has for the last three years conducted office of his own as Consulting and Contracting Engineer, having met with financial reverses, desires a position as general manager or superintendent; is largely experienced in the design and construction of high-grade engines, special tools and general machinery, and is competent to handle men and work systematically; open for immediate engagement. Address ENGINEER, ENGINEERING AND MINING JOURNAL.

MINING ENGINEER AND METALLURGIST desires position; has had 15 years' experience in the West and Mexico as chemist, ore buyer, metallurgist and manager of mining and smelting enterprises. Speaks Spanish fluently. Good references. Address W. R. B., ENGINEERING AND MINING JOURNAL, No. 17,868, Dec. 19.

POSITION WANTED BY A MAN OF 51 having had 27 years' practical experience in mining, milling and assaying, chloridizing, an amalgamation and concentration a specialty. Understands plate amalgamation for gold as well; can furnish references. Address LOGA, ENGINEERING AND MINING JOURNAL, No. 17,878, Dec. 19.

A CHEMIST, UNIVERSITY GRADUATE, experienced in all kinds of metal-work, wants position. Satisfactory references. Address ANALYST, ENGINEERING AND MINING JOURNAL, No. 17,875, Dec. 26.

SUPERINTENDENT, ENGINEER AND METALLURGIST. Familiar with erection and operation of quarry and mining machinery. Up-to-date on aerial tramways and cable hoists, pumping machinery, steam and electric drilling, earth excavation, etc. Pleased to correspond. Address G. W., 43 Gray St., Boston, Mass., No. 17,877, Dec. 19.

TWELVE YEARS SUPERINTENDENT AND Manager of gold mines and mills desires position: can make any gold mine pay that it is possible to make profitable; age 39 years; best references as to honesty, energy, sobriety, executive and business ability, etc. Address PRACTICAL, ENGINEERING AND MINING JOURNAL, No. 17,882, Dec. 26.

FIRST-CLASS ASSAYER DESIRES A POSITION in Mexico. Understands blast-furnace work, ore sampling, etc. Speaks Spanish. Best references. Address PLATA, ENGINEERING AND MINING JOURNAL, No. 17,883, Dec. 19.

WANTED—A POSITION AS FOREMAN of lead or copper blast furnaces. Speaks Spanish. Best of testimonials. Address FOREMAN, ENGINEERING AND MINING JOURNAL, No. 17,884, Dec. 19.

WANTED—AN IDEA; WHO CAN THINK of some simple thing to patent? Protect your ideas; they may bring you wealth. Write JOHN WEDDERBURN & CO., Patent Attorneys, Washington, D. C., for their \$1,800 prize offer, and new list of 1,000 inventions wanted.

Contracts Open.

TREASURY DEPARTMENT—Office of Supervising Architect, Washington, D. C., December 14th, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 7th day of January, 1897, and opened immediately thereafter, for all the labor and materials and erecting complete either a hydraulic or electric passenger elevator, also new steam boiler etc., for the U. S. Court House and Post Office building at Topeka, Kan., in accordance with the drawing and specification, copies of which may be had at this office or the office of the Custodian at Topeka, Kan. 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 or all bids and to waive any defect or informality in any bid, should it be deemed in the interest of the government to do so. All proposals received after the time stated for opening will be returned to the bidders. WM. MARTIN AIKEN, Supervising Architect. Orig.

STEEL RAILS.—Supply of 150,000 tons of steel rails and other permanent way materials, to be manufactured in the Colony of New South Wales. Offers are hereby invited by the Government of New South Wales and will be received by the Secretary for Public Works in Sydney, and the Agent-General for New South Wales, in London, until December 30th, 1896, from persons willing to contract for the supply of 150,000 tons of steel rails and the necessary quantity of fish-plates, fish-bolts and spikes, manufactured in the Colony of New South Wales, out of iron ore and other necessary materials the natural product of, and with coal, coke or other fuel, smelted, gotten and raised within the said colony, upon the terms and conditions which can be seen at the offices of the Minister for Public Works, Sydney, or the Agent-General for New South Wales, London. J. H. YOUNG, Minister for Public Works.

JETTY.—U. S. Engineer Office, Wilmington, Del.—Proposals for construction of Brush and Stone Jetty in harbor of Cape Charles City, Va., will be received until December 28th, 1896. Information furnished on application. WM. F. SMITH, U. S. Agent.

BRIDGE.—La Junta, Colo.—Public notice is hereby given that sealed proposals will be received at the office of the County Clerk of Otero County, Colorado, until December 21st, 1896, for the construction of a public highway bridge across Apishapa Creek, about 5 miles west of Manzanola, according to plans and specifications now on file in office of said County Clerk. All bids must be sealed and marked on the outside "Bid for Constructing Apishapa Bridge." Each bid must be accompanied by a certified check in the sum of \$200 as a guarantee that the bidder if awarded the contract will make and enter into a contract for said work with said county, and that he will furnish a good and sufficient bond for the fulfillment of said contract. J. E. GAUGER, County Clerk.

CORAL EXCAVATION.—Honolulu, Hawaii.—Sealed proposals will be received at the office of the Minister of the Interior of the Republic of Hawaii, at Honolulu, until December 31st, 1896, for the excavation of the hard coral in a slip to be constructed in the Harbor of Honolulu. Plans and specifications at the office of the Hawaiian Consulates at New York, San Francisco, California and Victoria, B. C., and also at the office of the Superintendent of Public Works, Honolulu. The Minister of the Interior does not bind himself to accept the lowest or any bids. J. A. KING, Minister of the Interior, Interior Office, Honolulu.

ELECTRIC LIGHT FRANCHISE.—Millville, N. J.—Proposals will be received until December 23d for the exclusive franchise for supplying the city of Millville, N. J., with 100 or more arc lamps for a term of five years. T. C. WHEATON, Chairman Committee.

JETTY.—U. S. Engineer Office, Portland, Ore.—Sealed proposals for extending the South Jetty, at Coquille River, Oregon, will be received here until Dec. 22, 1896. Information furnished on application. W. L. FISK, Captain Engineers.

WATER-WORKS AND ELECTRIC LIGHT wanted.—Proposals for franchise, by Tippecanoe City, Ohio. For particulars write JOHN M. HAAGA, Clerk.

DREDGING.—U. S. Engineer Office, New London, Conn.—Sealed proposals in triplicate for dredging in New Haven Harbor, Housatonic, Thames and Mystic rivers, Connecticut, will be received here until December 23d, 1896. Information furnished on application. SMITH S. LEACH, Capt. Engineers.

JETTY.—U. S. Engineer Office, Portland, Ore.—Sealed proposals for extending the South Jetty at Coquille River, Ore., will be received here until December 22, 1896. Information furnished on application. W. L. FISK, Captain Engineers.

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DIVIDENDS.

HOMESTAKE MINING COMPANY,
MILLS BUILDING, 15 BROAD STREET,
NEW YORK, Dec. 14, 1896.
DIVIDEND NO. 221.

The regular monthly dividend, TWENTY-FIVE (25) CENTS PER SHARE, has been declared for November, payable at the office of the company, San Francisco, or at the transfer agency in New York, on the 26th inst.

Transfer books close on the 19th inst.
LOUNSBERY & CO., Transfer Agents.

ISABELLA GOLD MINING COMPANY,
COLORADO SPRINGS, Colo., September 10th, 1896.
DIVIDEND NO. 9.

A dividend of ONE CENT PER SHARE (\$22,500) has been declared, payable September 25th, 1896, to stock holders of record September 18th, 1896.

The stock transfer books will be closed September 18th, 1896, at 3 o'clock p. m., and will be re-opened on the morning of September 25th, 1896.

PERCY HAGERMAN,
Vice-President and Treasurer.

ONTARIO SILVER MINING COMPANY,
MILLS BUILDING, 15 Broad Street,
NEW YORK, Dec. 18, 1896.
DIVIDEND NO. 209.

A dividend of TEN (10) CENTS PER SHARE has been declared, payable at the office of the company, San Francisco, or at the transfer agency in New York, on the 31st inst.

Transfer books close on the 24th inst.
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ASSESSMENTS.

CON. CALIFORNIA AND VIRGINIA MINING COMPANY.—Location of principal place of business, San Francisco, Cal.; location of works, Virginia Mining District, Storey County, Nevada.

Notice is hereby given that a meeting of the Board of Directors, held on the 8th day of December, 1896, an assessment (No. 7) of Twenty-five Cents (25c.) 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 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 14th day of January, 1897, will be delinquent and advertised for sale at public auction; and unless payment is made before will be sold on THURSDAY, the 4th day of February, 1897, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. **A. W. HAVENS, Secretary.**

Office—Room 29, Nevada block, No. 309 Montgomery street, San Francisco, Cal. Dec. 19, 2w

CONTRACTS OPEN.

Continued from Page 18.

WATER-WORKS—Abbeville, S. C.—Sealed proposals for furnishing material and labor required in the construction of a complete system of water-works for the city of Abbeville, S. C., will be received by the Secretary of Water Commissioners until January 4th, 1897. The approximate quantities are: 533 tons cast-iron pipe, 4, 6, 8 in.; 10 tons special castings; 50 double-nozzle fire hydrants; 36 valves and boxes; laying 6 1/2 miles of mains; stand pipe, pump and boiler; pumping station. Bids will be received for the whole or any section of the work and the Commissioners reserve the right to reject any or all bids. Certified check for \$150 must accompany each bid. Plans can be seen and specifications obtained at the office of the Water Commissioners, Abbeville, S. C., or at the office of **POWELL & MINSHALL, Engineers,** 140 Nassau street, New York City.

WATER-WORKS—Mokenca, Ill.—The city of Mokenca will receive bids for the construction of a system of water mains and the appurtenances thereto intending to include all such things as are mains and go to constitute mains constructed as are contemplated in a certain ordinance of said city established a general system of water-works for said city passed August 13th, 1895. Bids will be received by said city up to noon of the 10th day of January, 1897. All bids must be sealed and delivered to Charles B. Astle, City Clerk, and each bid must be accompanied with five hundred dollars (\$500) in lawful money or certified check of responsible bank. A ten thousand dollar (\$10,000) bond for the faithful execution of the contract will be required. The surety of the contract bond must be some surety company authorized by law to act as bondsmen in the State of Illinois. The city reserves the right to reject any and all bids. Plans, profiles and specifications may be seen at the office of the City Clerk, or any other information. Payment for above work will be under special assessment, proceedings which have been approved by the Supreme Court of Illinois.

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