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Table listing various articles and their page numbers, including sections like 'Gold Mining and Cheap Labor', 'The Employment of Chemists in German Works', 'Mining Labor in Western Australia', etc.

In another column a correspondent calls attention to the advantage of cheap labor claimed for mines in the South, and suggests a possible disappointment in this respect, if the quality of the labor is taken into account as well as the rate of wages. Some weight is to be given to this view, without doubt. Low-priced labor is often anything but cheap in the end. A great English contractor, who had executed engineering works all over the world, once said that the nominal rate of wages made really very little difference, since the cost of a unit of work was very nearly the same everywhere. His statement is corroborated by a distinguished Russian engineer, recently quoted by our Paris correspondent. Of course there are exceptions, where short supply and excessive demand may for a time carry the price of labor up to an abnormally high point; but the rule that labor low in price is also low in efficiency has a very general application. Some of our coal operators who have made experiments in this direction could probably give some striking illustrations—if they would.

The rapid progress made by Germany in the chemical industry has frequently been referred to in our columns, and we have also commented upon the reasons for this progress. Chief among them is the constant employment of technical skill in the improvement of processes and the devising of new combinations and new methods. At all the large German chemical works it is the custom to have, in addition to the experts who manage and direct the operations of the plant, a number of skilled chemists and assistants whose time is entirely occupied by technical researches. The owners of the works believe that the expenditure in this direction is well repaid by an occasional new discovery which may lead to greater economy in production or the utilization of some by-product previously regarded as waste. This belief has been thus far entirely justified by the results, as has been fully shown by the advances made in different directions. This practice has led to a demand for the services of chemists, and the consequence is that they command higher pay in Germany than in this country, although the average salaries paid for other kinds of expert work are on a much lower level there than here. It is to be hoped that in our industry the German methods may be adopted.

The rapid increase in claims taken up and mining companies organized in Western Australia seems likely to cause some trouble to the mine owners. Under the mining law of the colony the holder of a mineral lease is bound to keep at least one man at work for each three acres included in the lease. A large number of miners have gone to the colony during the past two years, but many of them are prospecting and locating claims on their own account, and the number of men available has not increased by any means as fast as the number of leases. Some of the companies find themselves under the necessity of importing men from other parts of Australia, which takes time and is expensive, while the men are not always to be had when wanted, nor are they always kept after their arrival at the mines. Wages are already high according to the Australian standard, £4 and £5 per week being paid, and it is quite possible that the rate will go still higher. It is becoming more and more difficult to obtain skilled miners, and almost any sort of labor is accepted. There is no supply of native labor to be had in Western Australia, as there is in South Africa, and the labor question is a growing difficulty just now. Very probably the demand will decrease after a time, but there is no immediate prospect of such a change.

The question of iron ore prices for 1897 is beginning to be a very general topic of discussion throughout the large district where Lake Superior ores are the chief supply of the blast furnaces. The Lake ore men throughout the past season maintained the high rates which were fixed at the opening of 1896, notwithstanding the unfavorable conditions of the market, and the furnace-men found themselves obliged to pay those prices in spite of the low quotations for their iron. This, of course, increased the advantage held by the large companies which control their own ore supplies, and were therefore enabled to put down their ores at the furnace at actual cost of mining and transportation. In previous years a sharp decline in pig iron output, such as we have seen this year, would have been followed by a reduction in the prices of Lake ores, but this year it has not been the case. Should the production again increase, as anticipated, the Lake ore men can easily meet the demand, as they are in position to mine and ship any quantity of ore which can possibly be called for. So far they have given no intimation of their intentions. Should they decide to name higher rates, as has been reported, or even to maintain last season's prices, there will be a strong protest from the furnace-men and a great deal of argument before contracts are closed.

A suit of considerable importance has recently been begun by the city of Philadelphia. It is an equity proceeding, the object of which is to restrain certain coal companies from dumping the culm and refuse from their mines and coal-washing plants into the Schuylkill River or its tributaries. It is brought under the State laws prohibiting the pollution

of streams which are used for the water supply of towns or cities, and is set for an early trial. The injury done to the Schuylkill water has become a very serious matter and the legal officers of the city believe that they have a very strong case. Should the suit be successful the coal companies in question may be put to a good deal of expense in providing dumping grounds for their waste.

A parallel case under the Pennsylvania law has been pending for some time. It is a suit brought by the borough of Port Carbon to enjoin the dumping of waste and refuse into Mill Creek, a stream which flows through that town and supplies it with water. The coal companies interested have fought this case with great determination and a great amount of testimony has been taken on both sides. The report of the Master appointed to take evidence in this suit has just been submitted to the court and it is very strongly in favor of the town.

These suits are evidences of the difficulties attending mining operations on a large scale in a thickly populated region like Eastern Pennsylvania. The probabilities are that, however the coal operators may fight for delay, they will have to give way in the end.

The returns of the Mexican Mint for the fiscal year ending June 30th last show that the coinage executed has varied in a sense altogether different from that of the production of the precious metals. A statement of the value of the coins executed for two years past is as follows, the amounts being in Mexican dollars:

	1894-95.	1895-96.	Changes.
Gold.....	\$545,237	\$565,786	I. \$20,549
Silver.....	27,628,981	22,634,788	D. 4,994,193
Copper.....	32,957	36,325	I. 3,368
Total.....	\$28,207,175	\$23,237,099	D. \$4,970,076

The gold coinage in Mexico has always been comparatively small in amount, and does not at all approach the production. The decrease shown in the silver coinage last year was probably due, in part at least, to the increasing proportion of silver which is exported in the form of base bullion. The output of the Mexican mines in silver, and especially in gold, has increased, notwithstanding the smaller showing thus made by the mints.

Of the silver coined only a small part remained in the country. The total amount coined last year, as shown above, was \$22,634,788, while the silver coin exported was \$20,377,663, or 90 per cent. of the total, leaving an addition of \$2,257,125 to the circulation. The large coin exports are, of course, explained by the slight premium which the Mexican silver dollar commands because of its general currency in China and other countries of the East.

An English Engineer on the Metric System.

In his address as chairman of the engineering section at the recent meeting of the British Association, Sir Douglas Fox, the eminent engineer, referred to the metric system in terms which apply in this country quite as well as in Great Britain. He showed the advantages which could be secured by the adoption of the simple and harmonious system which is now used by so large a part of the civilized world. England, he said, was losing many customers who preferred to buy in France and Germany, because they would no longer submit to the variety of weights and measures in use in Great Britain; especially as those weights and measures are totally lacking in all system and coherence and present, to people who are accustomed to the metric system, a chaotic mass of arbitrary units and divisions, which have nothing to recommend them but their antiquity. Even this is only comparative, and if we insist upon age as a recommendation, why would it not be better to go back to a still earlier period and use the Hebrew cubit, the Greek stadion or the Persian parasang?

The fact is that, as Sir Douglas Fox clearly pointed out, the system, or rather lack of system, which we cling to so obstinately, is superannuated and its continued use is an injury to our trade, which will be more and more felt as that trade increases. The metric system is easily learned and understood, because there is a simple and natural relation between its measures of length, capacity and weight. Once learned, it is remembered without effort, while our own variety of measures loads down the memory with a mass of arbitrary signs and divisions which are difficult to retain, because they have no relation and no reason for their existence.

A strong argument in favor of the use of the metric system here is that by common consent all over the civilized world it has been adopted by chemists and men of science. This has done a great deal toward making chemistry an international science and promoting the easy exchange of experiences and the rapid diffusion of new discoveries. The advantages gained in this direction are sufficient to show how much we would profit by the general adoption of the system.

It is quite natural that an engineer like Sir Douglas Fox, who has had the direction of important works in different countries and has come into contact with his co-workers of different nations, should see the advantages to be gained. His advocacy of the metric system should have great

weight with our engineers, who have been held back from aiding in the reform chiefly by the influence of a few men in the profession whose undue conservatism has been an injury to the country.

The Zinc and Franklinite Ores of Mine Hill, New Jersey.

A recent decision of the New Jersey Court of Errors and Appeals closes a series of lawsuits affecting the title to a very valuable and important mining property. The litigation has been of almost unexampled length, the questions at issue having been before the courts in various forms and through various parties for nearly 40 years. The property in question is the well-known Mine Hill ore deposit near the village of Franklin Furnace, in Sussex County, New Jersey, which was one of the first zinc mines worked in this country, is still a great producer, and apparently likely to continue so for many years to come.

The property was transferred first in 1848 by Col. Samuel Fowler, then the owner, to different parties, one deed conveying the right to mine the zinc ore, locally known as "red zinc ore," and another the right to the franklinite ore, which was at that time held to be valuable only as an iron ore. The willemite, or anhydrous silicate of zinc, which occurs in connection with the franklinite, was not then held to be of value, and indeed was not utilized in any way until some time afterward, when certain metallurgical inventions and improvements made it possible to recover the zinc which it contained. It was the wording of these deeds which led to the subsequent trouble.

The litigation first began in 1857, shortly after the discovery of the zinc value of the franklinite, and in one form and another was carried through the courts until 1877, when the United States courts finally decided that the franklinite title, at least so far as it referred to the southern half of the deposit, was vested in Moses Taylor, of New York, who had purchased it from the original owners. At the same time the zinc title covering the entire tract was held to be in the New Jersey Zinc Company. After the decision these parties agreed to consolidate their interests, and accordingly formed the New Jersey Zinc and Iron Company, which still exists. This corporation then owned the franklinite title for the southern half and the zinc title for the whole mine tract. The franklinite title to the northern half of the tract was at that time, and is still, owned by the Lehigh Zinc and Iron Company.

The New Jersey Zinc and Iron Company, however, claimed that as the greater part of the value of the franklinite had been found to be in the zinc obtained, the old title was no longer valid, and that the zinc title really covered all. After a great deal of preliminary skirmishing, extending over a number of years, a suit was begun in 1889, which has ended in the late decision.

In the varied course of the earlier litigation a number of plaintiffs and defendant were from time to time involved, but in the later and final suit the whole ownership had become concentrated in the two companies named above, which appeared as the only parties in interest.

The action in its latest form—a suit in ejectment brought by the New Jersey Zinc and Iron Company against the Lehigh Zinc and Iron Company—was tried in the Circuit Court for Sussex County in May, 1894, when a great amount of expert and historical testimony was taken. A full account was given in our columns* of this suit, which ended in a disagreement of the jury. Another trial of the case resulted in a verdict for the defendant, the Lehigh Company, and this judgment has just been confirmed by the highest court of the State, thus apparently ending the litigation.

The ore deposit at Mine Hill is a most remarkable one, and is, we believe, without parallel in the United States. It has been very fully explored by actual working and by drill borings, and while its limits are very well defined, it still contains an enormous quantity of valuable ores, far exceeding in quantity the amount taken out in nearly 50 years of working. This deposit contains a variety of metals—zinc, iron and manganese being the principal constituents. No other of similar character exists, with the exception of the deposit which is worked at Sterling Hill, some four miles distant.

This Mine Hill deposit is situated on the edge of the Upper Walkkill Valley, in the most beautiful section of the hill country of New Jersey. Its importance has been recognized for many years, as is shown by the persistence of the fight over its ownership. The extent of the traffic arising from its working was the cause of the building of an extension of the Sussex Railroad from Newton to Franklin Furnace, through a difficult country, and finally determined the location of a considerable section of the New Jersey Midland, now the New York, Susquehanna & Western, Railroad. Among the experts who appeared in the last trial are found such names as Professor Kemp, Professor Cook, the late State Geologist of New Jersey, Charles H. Williams, Dr. Moebius, Prof. W. P. Blake, Prof. G. J. Brush, Mr. Frank L. Nason, Mr. F. Canfield and Mr. J. Price Wetherill. The subjects covered by these experts included the zinc ores of all countries and the practice of zinc metallurgy in Europe,

*See *Engineering and Mining Journal* for July 7th, 1894, page 4.

as well as in the United States. The whole range of literature on the mining and metallurgy of zinc was brought in. The jurors in the different trials ought to have been able to graduate as experts—though it is very doubtful whether any of them did more than regret the length of the trial. The questions of fact, however, were practically decided in the lower court, and the final hearing in the Court of Appeals turned chiefly on technical legal points as to the conduct of the case and the admission of evidence.

The whole litigation arose from the imperfect understanding of the nature of the ores at the time the first deeds were made, and to settle the questions at issue has taken a longer time, more expert testimony and a greater expense probably than have ever been involved in any similar litigation in this country.

NEW PUBLICATIONS.

THE WITWATERSRAND AND THE REVOLT OF THE UITLANDERS. By George F. Becker. Reprinted from the *National Geographical Magazine* for November, 1896. Washington; Judd & Detweiler. Pamphlet. Pages 20, illustrated.

This paper, which was originally read before the National Geographical Society, gives a very interesting account of the Jameson raid and the simultaneous movement of the Reform Committee at Johannesburg, the result of which we all know now. This account is prefaced by some general description of the Transvaal and a summary of the history of the Republic and the growth of the mining industry there. It is generally fairly written and makes due allowance for the grievances which moved the Uitlanders, while acknowledging the rashness of their course and the folly of Dr. Jameson's action. Dr. Becker believes that the "Reformers, though very able men in their own professions, were mere puppets in the hands of men whose designs were much larger and more dubious than the correction of the Uitlanders' grievances." That is, he agrees, as most unprejudiced observers do now, that many entered into the Johannesburg movement honestly and without seeing that they were being made the tools of a wholly unjustifiable conspiracy in which the Chartered Company was the moving power; and he admits the astuteness of the heads of the Transvaal government, who were much more than a match for their enemies. The pamphlet is probably the best condensed history of the Transvaal troubles which has yet appeared.

HANDBUCH DER METALLHÜTTENKUNDE. By Dr. Carl Schnabel: Vol. II. Published by Julius Springer, Berlin, 1896. Pages, 706; illustrated.

This book, designated Volume II. of the *Handbuch der Metallhüttenkunde*, is really the third of a notable series given out within the last four years under Dr. Schnabel's name. The first, *Lehrbuch der Allgemeinen Hüttenkunde*, dealt with the general principles of metallurgy, discussion of methods in detail being reserved for the hand-book. In the first volume of the latter, which appeared two years ago, the metallurgy of copper, lead, gold and silver was considered; in the present, which is probably the last of the series, we have zinc, cadmium, quicksilver, bismuth, tin, antimony, arsenic, nickel, cobalt, platinum and aluminum. Out of the 706 pages, zinc and cadmium occupy 261; quicksilver, 100; tin, 51; nickel and cobalt, 125. It will be seen, therefore, that the author has not limited himself in space in the part of the book which we hold to be the most important, that devoted to the metallurgy of zinc.

Taking the three volumes together they constitute a contribution to metallurgical literature noteworthy in several respects. In the first place, it is probably the last of the works that we shall have attempting to cover the entire field of metallurgy, which formerly it seemed to be a task set himself by every professor to prepare. Students, nowadays, are demanding more specific information than it is possible to include in a general work; information, moreover, that none but specialists in each branch can give. This want is met by such books as Howe's on *Steel*, Peter's on *Copper*, Hofman's on *Lead*, Borchers' on *Electro-metallurgy*, etc., while the needs of the beginner are best filled by such works as Schnabel's own *Lehrbuch*, and Roberts-Austin's admirable *Introduction to the Study of Metallurgy*. Nevertheless there is no doubt that Dr. Schnabel is better able to furnish a valuable general treatise than the average professor; certainly far better able than the average German professor. Naturally endowed with a clear, incisive manner of expression, he has had the advantages of practical work in several lines before assuming his chair at Clausthal, and has traveled much among the metallurgical districts of America, Australia, England and the Continent. He has thus become familiar with modern practice, descriptive of which he has aimed to make his treatise, leaving his pages unencumbered by accounts of antiquated methods. In this respect certainly there is a great departure from the typical professor's book. Indeed, it seems at times as if Dr. Schnabel might well have made more extended reference to former methods in order to trace out economies which have resulted specifically from certain improvements in apparatus and changes in procedure. Seldom, however, does he make mention of old methods beyond the baldest particulars, disposing of them with the comment that they are no longer used. This admirable intention has been, on the whole, well carried out. A work of the kind is necessarily to a great extent a compilation, especially in those parts bearing upon results attained in practice, but it is to be regretted that the Dr. Schnabel did not throughout, as he did in certain places, incorporate dates in the text. However, his footnote references to authorities furnish us partially a guide. In the present review we shall confine ourselves to the portion of the book relating to zinc and cadmium, reverting to the remainder in a subsequent number.

The metallurgy of zinc (and cadmium which is practically the same), exceedingly simple in principle, involves many intricacies and difficulties in execution. Compared with the metallurgy of the other important metals it is backward, the salvage of the metallic contents of the ore not exceeding 90%, except in rare instances, and in general being much lower, falling as low as 75% even in present practice. This is not by any means

due to lack of scientific study or metallurgical skill in the industry, but rather to the peculiar properties of the metal itself. Nevertheless, there have been numerous improvements in the art, many of them of great economical importance, and conditions have changed materially even within the last 10 years. But as to these there is practically nothing in metallurgical literature since the date of Professor Kerl's *Grundriss der Metallhüttenkunde*, except a paper by Mr. W. Renton Juggalls in the second volume of *The Mineral Industry*. It was consequently with more than ordinary interest that we looked at the first section of Dr. Schnabel's new book.

Dr. Schnabel begins by describing the physical and chemical properties of zinc and its principal compounds in an excellent summary in the clear, concise style familiar to those who have been his students. He then takes up the decarbonization of calamines in heaps, stalls, kilns and reverberatories, and the roasting of blende, with the neutralization of sulphurous fumes (a matter of importance in thickly-settled countries like Germany, where it is, indeed, required by statute), and incidentally the manufacture of liquid sulphurous acid, which is now carried out at two works in Silesia and one in Westphalia. There are good descriptions of the muffle-reverberatories (those of Grillo, Liebig & Eichhorn and Hasenclever), which are at present the favorites with German zinc metallurgists, and reasonably good descriptions of the more important mechanical furnaces, including the Pearce and the O'Harra, neither of which had yet been employed for desulphurizing zinc blende, the Brown Horseshoe which is used for this purpose at Collinsville, Ill., and South St. Louis, Mo., but a very deficient account of the Matthiessen & Hegeler furnace at La Salle, Ill., which is undoubtedly the most remarkable mechanical roasting furnace, both in point of capacity and performance, in use in the zinc industry anywhere. Mechanical roasting furnaces indeed are but little in use in Europe, partly owing to the cheaper labor employed there, and partly owing to a prejudice against them as desulphurizing ore, the conditions of zinc-winning at present requiring the reduction of blende with 27% to 28% sulphur to but little more than 1 per cent. at the worst, a prejudice which is refuted by American practice. Dr. Schnabel falls in with this idea, saying: "At the high temperature which is required for the roasting of blende in the last stages it is objective to use the movable rakes only in the first part, *i. e.*, on the upper hearths. Since the movable parts are costly and soon require repairs these furnaces are chiefly adapted for countries where labor is high." Labor is indeed higher in Illinois, Missouri and Kansas than in Belgium, Rheinland or Silesia, yet blende is roasted cheaper per ton in mechanical furnaces at La Salle than in the new Hasenclever furnaces in Germany, the products being equally low in sulphur and the roast-gases used for sulphuric acid fabrication in each case.

The distillation of zinc from the burned or roasted ore is considered by Dr. Schnabel under the heads of Belgian and Silesian. The antiquated English and Corinthian methods, which occupy much space in many text books are referred to briefly, but little attention is wasted upon them. In connection with the Corinthian method, however, there is reproduced the figure of the vertical retort experimented with by Binon & Grandfils (at Stolberz, we believe) some 20 years ago, which is to be found in nearly all text books. "Concerning the economical results of zinc distillation in these tubes, and the extent to which they were used the author is ignorant," says Dr. Schnabel. The Binon & Grandfils furnace was undoubtedly an economical failure, but we should like to have mention of it in our metallurgical literature in other than this vague way, and its results should be put on record. The Belgian-Silesian method of distillation is classified by Dr. Schnabel with the Silesian. The Belgian and Silesian have during the last two decades approached each other somewhat closely in many respects, though in essentials they are still widely apart—and this drawing together is to be observed especially in Rheinland and Westphalia. We are inclined, however, to regard the process carried out in those provinces at the present time as partaking more of the Belgian than of the Silesian.

Dr. Schnabel's description of Belgian and Welsh practice is far from satisfactory. The same may be said of his treatment of American practice, which, in general, is far behind the European. It is true, but nevertheless presents many features of novelty and in certain instances improvements which are well worthy of consideration. This part of the treatise is derived obviously from scattered and isolated papers, that on America chiefly, we judge from the foot-notes, from Strecker's paper on the "Metallurgy of Zinc in the United States" in the *Jahrbuch der K. K. Bergakademie zu Leoben u. Pribram, etc., 1879*. The practice in Upper Silesia is more worthily dealt with, the author having apparently visited that district in 1895, and the many improvements which have been carried out there, especially by way of better recovery of fume from the condensers, improvements in the utilization of fuel, etc., are fully described.

We were surprised, however, to find so little space devoted to muffle and retort fabrication either in Belgium or Silesia, a highly important branch of the subject; and the few analyses of clays that are given are none of them recent. The mixture of ore-charges for retorts and muffles in order to neutralize corrosion of the walls, a subject which is the source of a good deal of experiment among zinc metallurgists at the present time, is referred to, but very incidentally, and we are given no analyses of ores, no examples of ore mixtures. Nor is there so complete a summarization of the losses incurred in zinc smelting as we should like to have.

The refining of zinc is described pretty thoroughly in a separate chapter, and a good deal of space is devoted to the winning of zinc from low-grade ores by a combination of wet and dry methods and by electrolysis. Most of the rational processes that have been tried for this purpose are mentioned, and their defects, chemical and economical, are soundly summarized. Dr. Schnabel is in error, however, in stating that the Farnell process, involving the roasting reaction, $3 \text{ZnSO}_4 + \text{ZnS} = 4 \text{ZnO} + 4 \text{SO}_2$, has not yet been put in use, since by it several thousands of tons of ore were treated at Swansea, Wales, in 1883 or 1884 (if we remember correctly) with fair commercial results.

The manufacture of zinc white direct from the ores in Pennsylvania, New Jersey and Belgium is described at considerable length, while the production of zinc-lead white in Missouri and Colorado is briefly referred to; as is also the production of zinc vitriol in the Lower Harz. This portion of the book, however, is essentially a compilation, and contains but little information that was not previously to be found in technical literature.

The illustrations of furnaces and accessories throughout the book are excellent, and in numerous instances dimensions are given, but the text contains almost nothing as to the details of furnace construction, materials or cost. Nor are there any data, not previously published, relating to the cost of producing zinc and the general economical conditions of the industry. These are some of the things that we have come to expect in a modern metallurgical treatise, and we are for this the more disappointed at not finding them in Dr. Schnabel's. It is a fault of omission rather than commission, but instead of a work like Peters' the result is rather one like Kerl's *Grundriss der Metallhüttenkunde* (valuable though that may be) brought up to date.

The typographical work of the volume is very good, and foreign names are spelled with very few errors. The index, which occupies but nine pages, leaves much to be desired. Fault may also be found with the paper, which is of the glazed variety that reflects light and is consequently tiring to the eyes.

BOOKS RECEIVED.

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

- The Civilizing Influences of Mining.* By G. A. Denny. Klerksdorp, S.A.R.; Klerksdorp Literary Club. Pamphlet, pages, 15.
- Estadística General de la República Mexicana, 1896.* A cargo del Dr. Antonio Penafiel. City of Mexico. State Printer. Pages, 906.
- A Statistical Account of the Seven Colonies of Australasia, 1895-96.* By T. A. Coghlan. Sydney, N. S. W.; Government Printer. Pages, 502; with map.
- Transactions of the American Society of Mechanical Engineers, Volume XVII.* 1896. New York; Published by the Society. Pages, 764; illustrated.
- Table Showing Loss of Head Due to Friction of Water in Pipes.* By Edmund B. Weston, C. E. New York; D. Van Nostrand Company. 1896. Pages, 170. Price, \$1.50.
- New Zealand: Papers and Reports Relating to Minerals and Mining, 1896.* Wellington, N. Z.; Government Printer. Pages, 457; with maps, diagrams and illustrations.
- La Machine à Vapeur. Parts I, and II.* By Edouard Sauvage. Paris, France; Baudry et Cie., 1896. Pages, 468 and 543, respectively; with diagrams and illustrations. Price (in New York), \$21.
- Röntgen Rays and Phenomena of the Anode and Cathode.* By Edward P. Thompson and Prof. William A. Anthony. New York; D. Van Nostrand Company. 1896. Pages, 190; with 60 diagrams and 45 illustrations. Price, \$1.50.

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.

Possible Uses of Sodium.

Sir: Can you or any of your readers tell me whether there would be an extensive demand for metallic sodium in case it could be furnished for a price much below the present, say, about 8c. per lb. From what direction would such a demand come, and how could it best be cultivated?

ORANGE, N. J., Nov. 27, 1896. C. E. A.

Gold Mining and Labor in the South.

Sir: In your recent editorial on "Gold Mining in the South" low-priced labor is enumerated among the undoubted advantages which this section enjoys as compared with other mining regions. Nearly every writer on the subject lays great stress on the advantage of low-priced labor. A word of caution on this point seems not out of place at this time when the returning tide of prosperity in the country at large is likely to result in an increase of investments in Southern gold mines. The low-priced labor of the South properly handled is cheap for many purposes and is an undeniable advantage, but it is a great mistake to base comparative estimates of the cost of mining here and elsewhere on the relative price of labor. One great disadvantage that operators of Southern gold mines have to contend with is the inefficiency of Southern labor in general, and especially the lack of skilled miners. Excepting the Haile and the Franklin mines, and possibly one or two others, no deep mining worthy of the name has been done in Southern gold mines for years, and in opening up a mine on any considerable scale one must count largely on taking the inexperienced, undisciplined native and making a miner of him. This takes time and costs money. I believe it has contributed more than any other one cause to the failure of many Southern mining ventures.

This is not said with the object of warning off any who may have such investments in view, but rather with the hope that they may be enabled to avoid the inevitable disaster that overtakes a mining enterprise started without sufficient capital. Low-priced labor is not always cheap.

F. POWELL.

ROCKMART, Ga., Nov. 18, 1896.

Silver Mining in Colorado.

SIR: In your *Journal* of November 7th, Mr. Rickard again asserts that the silver industry in Colorado was paralyzed in June, 1893. According to *The Mineral Industry* the production of silver in 1892, the year of prosperity, was 26,350,000 oz., and in 1893, the year of the "collapse," it was 26,000,000 oz. The manager of one of our largest smelting works tells me that he bought more silver in the last six months of 1893 than he did during the same period of 1892. At the time of the drop of 20 c. per ounce in the summer of 1893 he had on hand 1,000,000 oz. of silver, or one-eleventh of his production of that year. Of two other works one had about 500,000 oz. on hand, the other 300,000 oz., the latter having reduced its stock as much as possible in anticipation of a fall in price. In all probability at the other works the "smelter stocks," on which Mr.

Rickard lays stress, bore about the same ratio to the total production of the year. In 1894 there were 23,230,000 oz. produced in the State, and the amount purchased by the manager referred to was less than in 1893, in 1895 the production fell to a little less than 18,000,000 oz.

All this does not look like "collapse" and "paralysis" according to the meaning which these words had, when I went to school over 40 years ago. It has been suggested that an industry which does not increase very materially every year is spoken of by the enthusiastic American as having collapsed. If Mr. Rickard writes in this sense I ask his pardon for having misunderstood him.

As to the production of gold I do not think that any one denies that it has increased very much in the whole State during the last few years, owing to the discovery of new gold districts.

N. A. Y.
DENVER, COLO., Nov. 21, 1896.

THE AMERICAN INSTITUTE OF MINING ENGINEERS.

The seventy-second meeting of the Institute—being the twenty-seventh annual meeting—will be held in Chicago, beginning on Tuesday, February 27th, 1897. The arrangements are in charge of a local committee represented by Mr. James F. Lewis, whose address is 1328 Monadnock Building, Chicago.

A circular just issued by Secretary R. W. Raymond says that at this meeting a special topic of discussion will be the paper of Mr. Sauveur, on "The Microstructure of Steel and the Current Theories of Hardening," presented at the late Colorado meeting and already distributed in pamphlet form to members. This paper presents with great clearness the existing state of investigation and theory on the subjects of which it treats, and thus constitutes an excellent basis for wide and comprehensive criticism and for additional contributions, either of observed fact or of argument. Such criticisms and contributions are earnestly invited from all competent students of the subject. If sent early to the secretary, in writing (as is decidedly preferable), they will be printed for use at the meeting, and will thus secure attention whether the authors be present or not. In any event, immediate notice of an intention to take part in this discussion is requested. Copies of Mr. Sauveur's paper will be mailed upon application to persons desiring them for this purpose.

In addition to the above special topic, the subjects of any papers presented at preceding meetings will be open for discussion, and the Secretary would mention as particularly deserving of such discussion the following subjects:

1. The Physics of Cast Iron.
2. The Magnetic Separation of Non-magnetic Material, as described in the paper of Messrs. Wilkens and Nitze, presented at the Pittsburg meeting, February, 1896, and illustrated by Mr. Nitze, at the late Colorado meeting, in the operation of a working machine.
3. Vein Phenomena, as presented in the papers of Mr. Rickard on Vein walls and on the Enterprise Mine (the latter of which will be issued to members at an early day).
4. The Cyanide Process, as explained and criticised in the papers of Messrs. Packard and Furman, and the elaborate paper by Prof. S. B. Christy, of the University of California, on the Solution and Precipitation of the Cyanide of Gold (now in press, and shortly to be distributed to members).
5. The Concentration of Ores, treated in the papers of Messrs. Goodale and Tuttle, which were presented at the Colorado meeting, and have been already distributed to members.
6. The Arrangement of Lead-smelting Works, as presented in the paper of Mr. Austin, presented at the Colorado meeting, and already distributed to members.

The secretary further requests members who purpose presenting discussions or papers at this meeting to give him early notice of the proposed contributions.

A SUGGESTION ABOUT EXPORT TRADE.

In a recent communication to the State Department Consul O'Hara of San Juan del Norte writes: "Various commercial associations and museums have been organized and established in the United States for the dissemination of information respecting the exports and imports of foreign countries, the cost and selling prices of products and merchandise, freight rates, export and import duties, port charges and regulations, and the names and pecuniary responsibility of foreign merchants. These associations undertake, through their bureaus of information, to answer business inquiries of every nature and to furnish complete information in regard to the trade and commerce of any foreign country. The work undertaken by these associations and museums is one that deserves encouragement. I requested the president of one of these associations to cause to be sent to this office as full a line as possible of price-lists of all kinds of American goods and manufactures, that the same might be classified, indexed and bound and the bound volume be used as a book of reference. I have not received any of the lists asked for. I respectfully suggest that it would not be inappropriate for the Department to request the officers of such associations to use their endeavors to secure one set each of such price-lists for our consulates and agencies. With a volume of price-lists in each office consular officers might at times furnish to these bureaus more specific information concerning the conditions surrounding trade than is possible without the aid of lists showing prices at which United States goods and manufactures may be purchased. I suggest, also, that a list of merchants and manufacturers be forwarded to each consulate, showing the terms upon which each merchant and manufacturer mentioned is willing to sell his wares to responsible parties and the exact arrangement he has with each export agent in regard to commissions and other charges."

The Use of Power from Niagara Falls.—The first use of Niagara's power was made in 1725, a primitive sawmill being operated. Nothing more was done in this line until 1842, when Augustus Porter conceived the plan of hydraulic canals, and in 1861 one of them was completed. The Cataract Construction Company, from whose plant power has just been delivered in Buffalo, was incorporated in 1889.

THE SILVER MINES AT JOACHIMSTHAL, BOHEMIA.

Written for the Engineering and Mining Journal by E. Helmhaecker.

The old mining town of Joachimsthal is situated on the southern declivity of the Erzgebirge (in the Bohemian language Krusnéhory) forming the boundary between Northwestern Bohemia and Saxony. There are scattered mines which have been worked for precious and base metals on both sides of the range in Saxony as well as in Bohemia from ancient times. Of all the mines on the Bohemian slope of the mountains Joachimsthal, not far distant from Carlsbad and north of that place, is the most famous. Geologically the mountain elevation might be described in a general way as consisting of gneisses, mica-schists and phyllitic mica-schists of immense thickness; the whole strata intruded irregularly by masses and dikes of granite. In the surroundings of Joachimsthal there is no extensive granite area and this region is formed wholly of bedded rock, gneiss and mica-schist. The country rock in which the silver ore deposits of Joachimsthal occur embraces only phyllitic mica-schists as the predominating rock with an imbedded layer of crystalline limestone, both intersected by numerous dikes of quartz-porphry, probably referable to the Permian period, and also by (decomposed) Tertiary basalt-dikes. These country rocks are intersected by the silver-bearing lodes of regular position; one series of them going from east to west, the other vein-system crossing the first with a trend from north to south. Both sets of lodes are connected with the quartz-porphry and basaltic dikes forming sometimes contact veins between the schistose rock or limestone and the intrusive dikes. The metallic-lodes to a width of 1 m. and more consist mainly of angular fragments torn off from the adjacent rock often crushed and ground by mechanical action. In part they are wholly of decomposed rock, but mostly of mineral gangue, well connected at the faces or walls with the country rock.

The veins are mostly filled with waste gangue, composed principally of hornstone in continuous masses, in the first place, and also dolomite and calcite, sometimes in sparry lodes. The useful minerals are met with in the lodes as shoots and stringers of very limited extent, and sometimes in small pockets. The latter are richer because they are composed chiefly of silver ores. Then the lodes show successive parallel layers of ores, the zone in the midst sometimes with excellent crystals. The common ores are galenite, sphalerite, marcasite, also cobalt ores (smaltite), and nickel ores (chloantite, nikeline), native arsenic and bismuth, and sometimes uranite, nasturian and pitchblende. The rich pockets and smallshoots of the ore body carry silver ores, as ruby silver (proustite), argentite, stephanite, polybasite, native silver and other rare minerals. The smaller but much the richer silver ore pockets, within the generally barren lodes, have given at times a large amount of silver; but being sometimes rare or widely dispersed, the miners complained that the ores from these mines failed to pay sometimes for a long period.

The fact led the miners to look also to the other minerals accompanying the silver ores, particularly to the cobalt, nickel and bismuth ores, or rather to the uranium ore, and at the present time all the extension of mining is directed only to the most important mineral in the lodes, the uranium ore or pitchblende. Thus the silver mines of Joachimsthal with nickel, cobalt, bismuth and uranium-ores, as by-products, now too poor to pay as silver mines, are really the uranium mines with silver, cobalt, nickel and bismuth as the by-products. If this were not the case the mines might have been abandoned, as many other formerly rich silver mines in that section of country have been.

By the uplift of the mountain range and the forming of rents it was evident that the fissures followed the direction in which the rock has been the weakest; that is where a feeble resistance was offered along the lines of contact of porphyritic and trappean (basaltic) dikes—being old fractures—than anywhere else. Thus many of the lodes are contact veins between phyllitic mica-schist and porphyry or between schist and basalt, because the rent gave way anywhere rather than at the precise points where the connection was the weakest or where the first rents were produced at the Permian or Tertiary period.

The uranite having in the last half century a high and unexpected value, systematic prospecting and development at the higher drifts or levels of the mine has been undertaken, and much work has been expended upon them. Thus was discovered a relation of the scarce uranite accumulations in the silver ore veins, particularly in those veins running on the contact of the mica-schist with the eruptive dikes or intruded masses of basalt.

The basalt dikes become changed near the lodes to a decayed, dull grayish-green, half earthy, soft variety, having a somewhat argillaceous aspect and called *wakke* (or *basaltic-wakke*). The *wakke* resembles sometimes indurated clay, and when scratched exhibits a shining streak. At the junction of the lodes with the dikes of *wakke* basalt the mineral veins, sometimes very small and poor, open and improve, the lode widens or becomes irregular, and then the branches and stringers sent out into the *wakke*-dike vary in mineralogical composition, and it is found to be choked up with clay, dolomite and uranium ore (nasturian), though in very limited bunches, yet in payable accumulations.

This very interesting fact brings us back to another scientific point which can be observed only in few cases. Generally it may be very difficult to determine the precise age of veins, but here, in this instance, the distinct period to which the lodes are referable can be stated.

In Bohemia there are rich deposits of brown coal formed at three different periods of the Tertiary. The deepest beds of coal are imbedded in sandstone or clayey shales; the middle coal seams are in basaltic tuffean strata, sometimes intruded with basaltic and phonolitic dikes; the upper brown coal seams have been deposited in undisturbed position when the basaltic eruptions ceased completely. The three series of seams in the Bohemian brown coal measures, named also the pre-basaltic, basaltic and post-basaltic seams, with many well-defined plant-remains (leaves of dicotyledonous trees), found throughout the series most abundantly, attest that the coal-beds belong to the fresh-water division of the upper-oligocene, or Aquitanian, and the lower and middle period of the miocene (neogen), or to the lower and middle Mediterranean group.

Thus the age of the basaltic eruptions being determined in Bohemia as belonging to the lower miocene group, the silver veins of Joachimsthal

cutting through decayed dikes of basalt containing olivine—sheets of the same eruptive rock overlies upper oligocene (Aquitanian) and lower Miocene coals in the neighboring brown coal deposits—the lodes themselves must be, therefore, decidedly of a newer Tertiary origin than the lower Miocene group represents. It is a very interesting feature to which attention may be drawn; we may assume that the silver veins correspond with and are referable to fissures caused from time to time by the shock of earthquakes; by the upheaval of the Erzgebirge in a new Tertiary or post-miocene period.

All the minerals in the lodes referred to are as surface ores oxidized, and the later-formed minerals are derived from the decomposition of the other minerals named, but soon give way to the primitive ones below the perpetual water level. The cobalt and nickel ores are decomposed to pink and green earthy minerals or coatings (erythrine and aunabergite), but a great many other yellow, green, earthy, scaly, massive needle-form crusts or coatings result from the alteration of the nasturian by water and air. They are distinct mineralogical species or mixtures, as the chalcocite (uran-mica), zippeite, johannite, gummite, uranic ochre; or indistinct mineralogical species as medjidite, uranvocalcite, voglianite, eliasite, voglite, liebrigitte and others, and have, apart from their rarity, no practical importance, the nasturane or pitchblende being the only really useful ore. They are all derived from the decomposition of U_3O_8 .

These silver-ore deposits were discovered in the beginning of the sixteenth century on the estate of the Bohemian count, Joachim Shlik, named Joachimsthal, or in Bohemian, Ja-chy-mool, and repaid the working as early as 1516. The owners having been then, and ever since, partial to the Saxons, employed mostly Saxon miners and Saxon officials in their mines, which were called, on account of their prosperity, "Pearl of Bohemia." To them was granted by the Bohemian diet the right to erect a mint. About 1520 there were minted the first large coins, receiving in Germany, on account of their coming from Joachimsthal, the denomination Joachimsthaler, or shortened, "thaler," while in Bohemian the coins, extracted from the mines or valley, both named in that language "dol," get the name "dollar."

The mines attracted many adventurers and in the beginning 1600, and later on 1614, mining claims were granted to them. But in the year 1542 there arose a quarrel between the officers of the King Ferdinand I. and the Count's officials over the royalty and at last the King decided to confiscate the mines in the year 1547, and a pretense was found for indicting the Counts for high treason, it is said for their kindness to the Saxons. But at the opening of the seventeenth century, the mines suffering in the turbulent times began to shorten their returns. The Emperor Rudolf II., desiring new explorations, offered privileges to those who might have the intention to mine, but in vain. In the Thirty Years' war, the mines suffered exceedingly and were almost abandoned. From the year 1615 to the present time, it is safe to say, the mines have never realized a profit, the working expenses, no matter how carefully watched, with a view to economy, being always larger than the returns. In spite of the suspension of mining operations during a long time, the mines offered many natural advantages, and new investigations were made by the Crown, at the end of the eighteenth and the beginning of the nineteenth century and the development of its silver-bearing, in depth, rapidly pushed forward.

Thus about the middle of the present century, there were two mine-divisions, the eastern and the western, one provided with all appliances in ore-dressing machines and smelting plant and some water-wheels, water-pressure engines and steam engines for draining and hoisting.

In the Eastern mines the depth of the working is from 400 to 550 m., the water to be pumped reaches 8-9 cu. m. in the side workings and 73-8 cu. m. per minute in the main shaft (Einigkeits shaft). The temperature of the country rock at the depth of 497 m. is equal to 23.2° C., while the temperature of the mine-water at its dripping out of the rock fissures is marked in the Einigkeits pit with 28.6° C. The average returns in the eighth decade of this century were about 38 tons of silver and uranium ores of the value of 65,000 fl. There were engaged working 103 men. In the western mine the main or Werner shaft has reached the depth of 435 m.; there is a pumping engine of 25 H. P. and 170 men are engaged. The average yearly output for 1870-80, was: 50 kg. silver, 65 kg. cobalt and nickel, 95 kg. bismuth, 950 kg. lead and 2,000 kg. uranium ore (nasturan) concentrates, of the total value of 40,000 fl.

There was erected a stamping mill with one battery of nine stamps, driven by a turbine; in the ore-dressing shop there are rollers for crushing ore, an apparatus for separating the ore, screens, two self-acting (Rittinger) percussion-frames, 1 Salzburg self-acting frame and several sweep-tables; all served by two laborers. In 1870-80, there were dressed 199 tons silver ores, and 14 cwts. uranium ore to 6 tons and 4 cwts. concentrated Ag and U-ores. All the ores raised were smelted till the year 1871 in furnaces; but in 1872 the smelting works went out of blast, and the Ag, Co, Ni, Bi ores were sold to the Freiberg, Saxony, smelting works. Since 1890 all the silver concentrates are delivered to the Crown smelting works at Příbram, Bohemia. The Eastern mine division, after having stopped out all the silver ores, was abandoned in the year 1890, and only the Western mine is in operation. In former times the cobalt and nickel ores were without any value, the uranium ores were not known, and they were thrown in dumps with other debris or left in the wastes below ground. But since the real value of the cobalt and nickel ores, and later on also the exceeding valuable nasturian (uranite) was recognized, all the ores with a pink ore apple-green, also those with yellow or green coatings, as secondary products, were again recovered out of the wastes in the old workings or dumps; and those deposits carefully raked over repaid the prospectors well.

The present state of mining at Joachimsthal is the following: The Eastern mine with the two mainly uranium-ore bearing *geister* and the lode known as the Wiedersinnischer and the Elias vein in the Western mine carrying uranium ore with accidental or collateral silver, cobalt, nickel, lead, bismuth and arsenic ores (native arsenic). Beside the Crown mine successfully mining on uranium ore another idle silver mine with the name Sächsisch Edellent-Stollen, owned by a private company, has resumed its work and makes satisfactory returns. The success of the Crown and private mines shows what may be expected in this direction when a thorough prospecting has been done, and therefore two adjacent old claims are reopened, one of them having commenced prospecting. There are therefore four mining properties at Joachimsthal, two of them working (one Crown and one private) and two idle. Since the

year 1880 to 1894 the mines have raised undressed uranium ore 165 cwts. (156 cwts. alone from the Crown mine); 256 cwts. (Crown mine alone 233 cwts.); 225 cwts. (197 cwts. from the Crown mine); 171 cwts. (Crown mine, 152 cwts.); 211 cwts. (Crown mine, 191 cwts.); 264 cwts. (Crown mine, 228 cwts.). The value of the undressed mined uranium ore taken on the pit's mouth ore where the mining labor ceases to act on it was in the years 1889 to 1894 per cwt. (= 100 kg.) respectively, 148, 163, 199, 140½, 136, 225 fl. Besides this the Crown mine raised silver ores in the years 1889-1894 in cwts. 310, 480, 10, 190, 123, 42, at the average value per cwt. 83, 99, 82, 96, 150, 47½ fl. Nickel and cobalt ores extracted from 1890 to 1894 were: 3½, 10, 2½, 100, 548 cwts. at the price varying about 83 to 100 fl. per cwt. In the year 1894, there was also an output of arsenical ore (mainly native) of 21½ cwts. at 4½ fl. The total men at work in mines (Crown and private) in the years 1890-1894 were 320, 264, 258.

The uranium ore sold at a low price in former years, and there were sold in the year 1830 about 1 cwt. at 150 fl.; in 1852, 8.4 cwts. at 400fl., to chemical laboratories (chiefly in Prague). About 1848 Patera found a method for assaying the uranium ore, and the mining board of the government decided to erect a laboratory at Joachimsthal, under the direction of Patera himself, to convert the nasturian into uranium colors. The color-house was finished 1852-53, and Patera began the treatment of the pitchblende by a method invented by him, and improved or enlarged later on by others, namely his successors, Vysoky, Mannlicher, and other able men.

Before the erection of the color manufacture at Joachimsthal, the actual value of the uranium ore as an element, both of actual wealth and as a very useful chemical product, has been underestimated. New uses were found, and owing to the increasing demand, the valuations of the mines and the works increased. Thus in the year 1879 the price of the dressed ore from which there were treated 39½ cwts., reached the unexpected price of 20 to 25 fl. per km. The average price of 1 cwt. dressed concentrated ore during the years 1890-96 was 900 fl., while the colors realized an average price of over 2,100 fl. per cwt., but the price is slowly decreasing. The color works paid last year for concentrates or dressed ore per 1 cwt. at the average price of 500 fl., and the colors were sold at the average price of 1,310 fl. per cwt.

The uranium ore, the nasturian (uraninite, pitchblende) is usually massive or in grains with a color from grayish to velvet black and dull, sub-metallic pitch-like luster. The opaque mineral, with uneven fracture and brownish-black streak, should have the chemical composition, if pure, $UO + U_3O_8 = U_3O_4$, but it is mixed in a high grade with a great many impurities, so that the ore contains U_3O_4 only from 68.5 to 86.5%, while the admixtures are FeO = 2 to 5.7%; CaO, 0 to 5.8; MgO, 0 to 0.5; SiO_2 , 2.4 to 5.4; PbS, 2.8 to 0.6; PbO, 0 to 0.7; Al_2O_3 , 0 to 0.3; Bi_2O_3 , 0 to 1.2; Bi, 0.5 to 0.6; Cu, 0 to 3.9; CO_2 , 0 to 3.3; MnO, 0.1 to 0.8; As, 1.2-4.3; Zn, 0 to 0.7%; H_2O , 0.4 to 2.6; also SO_3 , V_2O_5 , sometimes also traces of Ag, Co, Ni, Mo, Sb, Na, O. Almost all the uranic minerals of yellow or green colors, already alluded to as occurring with nasturian, derive from the decomposition of this black species. Though the uranite occurs in iodides with silver and lead ores also at Johangeorgenstadt, Marienberg, Schneeberg, in Saxony, on the northern slope of the Erzgebirge, also in Pribram, Bohemia; near Redruth in Cornwall, in Mitchell County, North Carolina; in Hungary and Turkey, it is found nowhere in extractable quantity except at Joachimsthal. Thus the laboratory, opened at that place, where the ore is converted into colors for use, is the only one in the world and the Crown monopolizes the trade.

The treatment of the dressed ore of superior quality to convert it in a marketable product is the following, according to Patera. Lots of 70 kg. are calcined in a reverberatory furnace for nine hours to decompose the sulphurets, arsenites and other admixtures. To the cooled roasted matter are added 15% calcined soda carbonate (Na_2CO_3), and 2% soda nitrate ($NaNO_3$), and it is again strongly heated for three hours, by which the ore undergoes an alteration. This process affords in water soluble salts of As, Mo, V, S, etc., and converts the U_3O_4 into a form readily soluble in dilute acids. The heated mass is extracted with hot water, by which U_3O_4 is partially parted from its impurities, the residue consisting mainly of impure U_3O_4 , which is dissolved in dilute sulphuric acid (SO_3). Then to the solution of U_3O_4 is added a caustic lye of soda (Na_2OH_2O), by which the other metallic oxides, and also U_3O_4 , $3H_2O$ are precipitated, but the U_3O_4 , $2H_2O$ precipitate is again soluble in an excess of caustic soda. This solution is treated with $NaCO_3$, and leaves an insoluble soda uranite $Na_2U_2O_7 + 6H_2O$. This process had been in use since the time that Patera began with it; but although many changes in the treatment of uranium ore have occurred, and many improvements been effected since the beginning of the treatment, the mode of the chemical process has remained practically the same up to the present time.

In the uranium laboratory were engaged till the year 1887 some 18 skilled and unskilled laborers, but the number has been reduced since to 11 persons. The works purchased dressed ore from the mines during the years 1887 to 1894, 30, 50, 43, 50, 58, 62, 87½ cwts., the price per cwt. varying between 337 to 657 fl.

The marketable product, which means the colors into which the ore is converted, are the following: 1. Yellow uranium ore, being $Na_2U_2O_7 + 6H_2O$; a hydrous uranite of soda produced in three varieties, appearing yellow, orange and dark orange, the first with $U_3O_8 = 83.2%$, the second with $U_3O_8 = 84.7%$. 2. Hydrous uranite ammonite, $U_2(NH_4)_2O_7 + 6H_2O$, wrongly called uranium-oxide. 3. Black oxide, $U_3O_4 = UO U_2O_3$, yielding 98.4% of pure U_3O_4 , the balance being other impurities. The uranium derivatives, being colors used for glass-staining and very valuable in porcelain painting, are also much in demand for chemists. The ore mined is sometimes only limited in quantity, while the works could deal with a much larger quantity of derivatives. The prices are therefore very high. In 1879 the average price of 1 kg. uranium, laboratory production, was 30 fl. (the colors 1, a, b, c being 24, 22, 28 fl., 2 being 28 fl., and 3 being 36 fl.), owing to the increasing demand.

The yearly output of colors is very variable, amounting from 20 to 120 cwts. From 1880 to the end of 1894 there were produced of these colors, 28, 32, 30, 20, 32, 95, 110, 30, 35, 38, 39½, 41½, 24½, 45, 49 cwts. The average price for 1 cwt. colors from 1889 to the end of 1894 was 1,16½, 1,623, 1,095, 1,152, 1,410, 1,430 fl. per cwt.; it had fallen off in comparison with the year 1879. Two-thirds of the last year's production was consumed in Austria, while one-third is shipped abroad.

CHEMICAL EDUCATION IN ENGLAND AND GERMANY.

At the recent meeting of the British Association, the Chemical Section devoted one session to discussing the teaching of science. Sir Henry Roscoe opened the discussion by reading a paper, which is abstracted in *Engineering*. The appreciation of scientific education, Sir Henry declared, was greater in Germany, and Englishmen, especially chemists, had not been slow to avail themselves of the advantages offered by the German laboratories and universities, which were open to all nationalities. Those facilities had fostered chemical industry in Germany, and without holding any pessimistic views, he had no doubt that many of the complaints about the position of that industry in England were well founded. In the opinion of some, the evil was to be found in the want of appreciation of scientific research on the part of manufacturers; others traced the fault back to university education, especially to the system of the old seats of learning, where too great weight was laid on examination results, and too little encouragement given to original research. If science found its legitimate expression in the university curriculum, the schools would soon adapt their instruction to requirements. Both of these causes were probably at work. English laboratories and professors were as fully competent to turn out a finished article as any; but if the article was not in demand, it was useless to manufacture it. Sir Henry particularly referred to the soda and chlorine industry as establishing what British skill and energy can achieve; Dyar and Hemming, Deacon, Glover, Chance, Weldon are all English names. On the other side, he mentioned that one renowned firm of dye manufacturers at Höchst-on-the-Main employed 100 trained chemists at salaries of from \$1,000 to \$2,500 essentially for research work. What was wanting in England was a national system of secondary education. He hoped that the recommendations of the Royal Commission, of which he had been a member, would form the basis of legislation in the next session; \$3,700,000 are now devoted to technical education; the greater part of the money, however, is given to the furtherance of a less varied instruction than was needed for striking out new paths in science.

Dr. L. Mond emphasized the need of a properly organized system of secondary education, in which the other speakers concurred. Professor Campbell Brown wished to raise the standard of education in the secondary schools. Professor Ramsay saw the necessity of a change in the university system, but not the way of accomplishing it. He thought that they might grant more money for higher scientific training.

THE JACQUES CARBON GENERATOR.

The subject of producing electric energy direct from coal is one of universal interest. Since the publication of the experiments of Dr. Jacques, of Boston, and descriptions of his apparatus, requests for more information have been numerous, and also several criticisms of the reported results have appeared. These were mainly in the line that insufficient data have been given to justify the acceptance of conclusions reached. In the December *Harper's* is an interesting article by Dr. Jacques, giving much more complete information. Some of his conclusions as given are important. The first is that the electric current was due to the chemical combination of the oxygen of the air with the coke (carbon). Quantitative tests showed that oxygen was taken from the air; that the carbon was consumed, that carbonic acid was formed. At the same time the electromotive force obtained agreed almost exactly with that theoretically obtainable from the combination of oxygen with carbon to form carbonic acid (1.04 volts). That the phenomenon was not due to formo-electric action was proved by the fact that when the whole apparatus was so inclosed that all parts were kept of uniform temperature the maximum electromotive force and current were obtained. Some experiments with larger apparatus have confirmed these results, and have shown that under proper conditions the electrical energy obtainable from one of these generators is substantially equal to the potential energy of the weight of carbon consumed within the pot.

So far only relatively small carbon electric generators have been built; and it should be remembered that with this generator, as with the steam engine, increased size means increased efficiency per pound of coal. Some results of a test (made by experts not connected with the development of the invention) upon a small and comparatively crude 2-H. P. carbon electric generator that has been in occasional use for some six months, are as follows: Average electrical horse power developed, 2.16 H. P.; average net electrical horse power used by air pump, 0.11 H. P.; average net electrical horse power developed, 2.05 H. P.; carbon consumed in pots per electrical horse power hour was 0.233 lb.; coal consumed on grate per electrical horse power hour was 0.336 lb.; total fuel consumed per electrical horse power hour, 0.559 lb. The electricity obtained from 1 lb. of coal (of which 0.4 lb. was consumed in the pots and 0.6 lb. was burned on the grate) was 1,339 watt-hours, or 32% of that theoretically obtainable.

These figures, it is claimed, show that the efficiency of this particular generator was 12 times greater than that of the average electric light and power plant in use in this country, and 40 times greater than plants of corresponding size. There are, the author says, many details still to be worked out, and many improvements yet to be made, before the carbon electric generator can be put into general commercial use on a scale comparable with that of modern steam engines.

American Water Power vs. English Steam.—President A. E. Hunt, of the Pittsburg Reduction Company, is reported to have stated that the English plant of the Reduction Company has been shut down. This plant was started in 1890 at Patricroft, a place between Liverpool and London in the Black Country. It was on the line of the London & Northwestern Railway and in the vicinity of the great chemical district known as Widnes, where coal is as cheap as anywhere in Great Britain. The plant was as well equipped as the development in electricity in those years would permit, but he found he could not compete in cost of manufacture of aluminum with the metal produced by water-power.

THE BALD MOUNTAIN DISTRICT, WYOMING.

Written for the Engineering and Mining Journal by Fred. D. Smith.

The Bald Mountain mining district is located in the extreme northern part of Wyoming in the Big Horn Mountain range. The plateau on which it is situated is the narrow top of a ridge which acts as a watershed, for on the east side the Tongue River rises, in the northeast are tributaries to the Little Horn River, and on the western side streams take source and empty into the Big Horn River. The inaccessibility of the district has prevented it from gaining much outside reputation, it being 60 miles from the railroad at Ranchester, Wyo, and at an elevation of about 11,000 ft. It is reached only by teams which require 16 to 24 hours for the journey. The camp was first established in 1893 to work a small placer, but as this was exhausted soon after active operations were begun, attention was turned to a large deposit of gold-bearing conglomerate. The largest beds of this conglomerate or cement lie on a rather level plateau which is surrounded by large hills. Bald Mountain, being the largest of these, gives the name to the camp.

The extent of the conglomerate has never been accurately determined, but in this valley or basin alone there are hundreds of acres of it, sometimes covered with 5 to 15 ft. of soil and at other places lying exposed on the surface. Its average depth is probably 25 to 35 ft. The formation in the immediate locality is granite, frequently crossed by dikes of eruptive rock, the whole being cut extensively by joint planes and disturbed greatly by upheavals and tiltings. The granite is underlying limestone which can be seen cropping out on all of the hills around the camp.

The only company which has undertaken active operations here is the Fortunatus Company which placed an amalgamator costing \$25,000 on the placer, near the cement. This was soon deserted for more extensive work on the latter rock. A mill was erected and work commenced on this ore by means of five Tremain stamp-mills. It has not yet been satisfactorily demonstrated that the ore is capable of being worked by amalgamation.

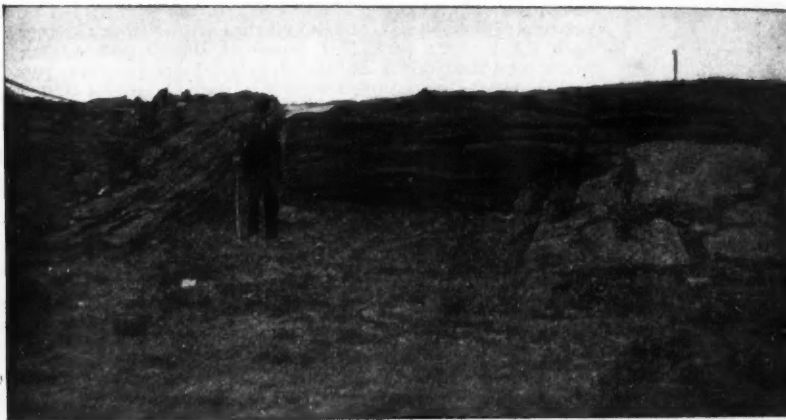
Considerable excitement was caused last August by the announcement that the manager of this company's property had discovered gold in most of the granite rock in the vicinity. He stated that it seemed to be universally distributed throughout all of the ledges and dikes (called leads) in the district, and expressed the belief that the gold was in the

cible process on tellurium ores may possibly cause lower results for gold than the scorification process gives, I certainly claim that such has not been my experience with sylvanite carrying as high as 21 oz. gold to the ton. Nor have I found that roasting these ores has the least beneficial effect on the assay, providing plenty of litharge is used to oxidize all of the tellurium to the oxide. While I was positive that there was no tellurium in the rock in question, yet in order to satisfy everybody concerned, I varied the assays in many ways. The methods were:

1. Assay by the ordinary crucible process with much litharge.
2. Previous roasting with silica and charcoal at low red heat.
3. Prolonged roasting with same agents at high heat.
4. Roasting without these agents at low red heat for 10 or 15 minutes.
5. Quick roasting without these at white heat.

The roasted samples were assayed in the usual manner by fusion in a crucible. In no case, after examining 11 samples of the granite and making in all 17 assays, did I find the least trace of gold. While the investigation was carried on independently of the manager of the Fortunatus Company, the selection of the samples was based on statements made by him. It was the intention to assay as many as possible of these rocks in which he claimed to have found gold. No shafts of more than 10 ft. in depth had been sunk, and from a large number of the more highly prized ones large samples were easily taken. Mr. Tewksbury, the manager, did not appear to be hiding anything more valuable than his mysterious process, and freely advised all prospectors in regard to the claims to be chosen, as well as assayed their samples gratuitously. He willingly gave me two specimens which he said he had assayed and found rich in gold, the rock having increased \$14 to the ton in going down 40 inches.

Unless he had a vein or lead hidden and as yet undiscovered by the men with whom I talked, and unless he deliberately misrepresented the samples given to me, it would seem that one would be justified in concluding from the results of these assays whether there was any gold in the granite rock or not. That there was no intention to misrepresent or conceal anything is shown by later developments. A diamond drill has since been placed in the 10-ft. shaft on the Lake Claim, the most noted of any of the claims located by Mr. Tewksbury, since it was from this shaft that he had taken samples, which, according to his assay, ran from \$170 to \$1,230 to the ton. On account of the above assays being claimed, I ex-



CONGLOMERATE OUTCROP AND GRANITE LEDGE, FORTUNATUS MINE, WYOMING.

form of a telluride. The assays were all made by the manager himself, who stated that it was only after long experimenting that he was able to so treat or assay the rock that the gold would show itself. He accounted for the failure of other assayers to whom the rock had been sent, by claiming that they were using the old prescribed methods which he had already proved to be inefficient. The author was sent to this region to examine the rock, and in order to facilitate the work, an assay outfit was taken along and the assays made there. This work was afterward supplemented by chemical as well as microscopical examinations in the Cornell University laboratories.

Since the gentleman referred to still insists that he can demonstrate by his improved methods of assaying the existence of gold in this rock, it becomes necessary to state the methods used in the examination. Some of his statements appear so very erratic that it may seem inexcusable to waste valuable time and space in refuting them. Some of his assertions are that "the rock is not granite, but crystallized quartz;" that "the softer blue parts of the rock (chlorite) are tellurium, which carries the gold in fine particles;" that the fluxes used in fusing by the crucible method prevent the escape of the elements (gold and silver)."

These and others lead one to doubt the necessity of even refuting his persistent statements, and while I admit that a detailed account is superfluous to prove to any trained analyst that he is wrong, yet ridicule alone cannot prove this to the layman. It was found that the theory that a tenderfoot in the business had struck accidentally a new thing which was unknown to scientists and which did not accord with their views was a very acceptable and plausible theory to the ordinary citizen. I shall not attempt to prove the fallacies of each of his statements, but will simply give the results of my work.

The rock is granitic in all localities, and is made up principally of quartz, feldspar, mica and chlorite. These with other ingredients in varying quantities and sizes are found in all parts of the camp examined. It is constantly changing in appearance, due to the marked crossing by dikes, and disturbances of similar character, but no fissure or contact veins were found. Very few specimens showed to the naked eye any metallic constituents, pyrite and magnetite alone being visible. None of the samples examined gave the least trace of tellurium by the sulphuric acid test.

The basis of this gentleman's pet theory is that the tellurium must be removed by roasting and proper fluxing, otherwise it will fuse with the gold still combined and carry it into the slag. While the ordinary cru-

mined the rock from this shaft with particular care, having selected as much as 25 lbs. for sample, and assayed it by as many as six different methods of procedure. The two specimens which he gave me were also very carefully and critically examined. I made as many as four assays of each piece under varying conditions.

The investigation was continued in the chemical laboratory on the Lake Claim rock and on the two samples given me by Mr. Tewksbury. Qualitative analysis showed only iron, aluminum, magnesium, calcium and silica. Lest the question might be raised that I could not definitely prove that the gold was not so combined that it could not be smelted from other elements, I oxidized one portion with concentrated nitric acid for six hours and another portion with the same acid in connection with crystal chromic acid. This should certainly leave the gold free to be taken up by the lead. The residues were dried and assayed and the solutions tested qualitatively for silver, gold, arsenic, antimony and copper. Neither the assays nor analyses showed any of these metals, and I thus satisfied myself that all of my previous assays were correct. The three samples mentioned were examined by Prof. A. C. Gill, of the Geological Department, who reported that the rock is granitic in all three cases, the samples differing principally in the amount of alteration of the feldspar, mica and magnetite contained. He identified the following minerals: Quartz, feldspar, biotite mica, magnetite, small quantities of apatite, zircon, sphene, chlorite, limonite, epidote, muscovite, kaolin, pyrite and brown hornblende. There are no other constituents large enough to be visible with a magnifying power of two hundred diameters. The only mineral found in these samples that ever carries gold is pyrite or its alterations, the assay of which has been very well established for years. The pyrite is in exceedingly small proportions in the rock, probably not equaling 0.01%. The other mineral ingredients of the rock have never been observed in themselves to carry gold either mechanically or chemically combined, but if they should, their chemical nature is such that the usual methods of assaying could not fail to bring out the gold.

Mr. Tewksbury still insists that he will yet prove his statements, even after he has become aware of my work and its results. Those who believe in him yet are probably influenced by that condition of mind in which "the wish is the father to the thought." If he succeeds in doing what he claims, it must result in bringing out a new mineral of gold such as geologists, chemists and mineralogists never saw.

THE EXTRACTION OF SULPHUR FROM BRIMSTONE ORE.

Written for the Engineering and Mining Journal by Edward F. White.

Native sulphur usually occurs in sedimentary deposits or in solfatara earths, and for general industrial purposes requires to be separated (usually by mechanical process) from the earthy impurities which are always more or less intermixed, the product of this preliminary process of partial refining being our so-called "crude" brimstone.

As is the case with all composite mineral ores, the location of the mineral deposit, percentage of mineral richness, efficiency and economy of methods of separation and the final value of the element obtained, one or all, determine the grade of allowable working ore. The third of the relations mentioned, namely, the efficiency of apparatus and the economy of methods employed concerns our present consideration respecting the separation of sulphur earths.

"Efficiency" of apparatus is purely a mathematical relation between total expenditure and available product, measured in like or equivalent units, the latter divided by the former. "Economy" of method varies under different conditions, such as cost of labor, fuel, water, the convenience and supply of engineering materials. The scarcity or abundance of one or more of these requisites may increase or diminish the importance to

"crude" brimstone in the distilling apparatus. As usually constructed the steam-heat separators are operated on a plan of periodical charging, melting and discharging. This involves much loss of time and labor, great inconvenience in operation, such as the frequent making and breaking of difficult steam joints (the steam being admitted directly to the ore), the necessity of handling large bulks of molten sulphur, the difficult work of removing chilled sulphur-slag from the walls and grates of the separators, besides occasioning large heat losses by the repeated cooling of the apparatus in order to remove the separated products and to recharge for another operation. It is not necessary to mention for the present purpose various other forms and methods of treatment of sulphur earths for separation which have been proposed, patented and more or less experimented with, but have never come into extensive use.

The following described and recently designed apparatus is constructed to employ as a heat-conveying medium either steam, hot water or hot air. It further differs from the old form of steam apparatus in that it operates by surface melting instead of direct contact of steam and ore, and even a more important point than either of the two differences mentioned is its feature of continuous operation. In this arrangement, by the use of hot water instead of steam, a great saving of heat is effected, which is of necessity lost in the steam apparatus, as a result of the cooling and condensing of exhaust steam from the temperature of melting sulphur (corresponding to 10 lbs. steam-gauge pressure) to the temperature of boiler feed—an amount in thermal units nearly nine times that required to melt the sulphur from a given weight of ore.

Referring to the accompanying cut, Fig. 1 is a vertical view of this apparatus, half in section and half in external elevation. Fig. 2 shows half of the top in plan.

The operation of the apparatus is as follows:

Steam or water from a boiler working at about 80 lbs. gauge pressure is admitted to fill the spaces *A B C*, with an arrangement of piping to maintain a constant circulation between the boiler and the separator. The crude sulphur, after being broken to pass a 3 in. ring is dumped in at the top opening *L* immediately upon the upper end of the inside heater *A*, and passes down through the annular space *G* between the heating surfaces of the inside and outside heaters *A* and *B* by means of the conveyor spiral *D*, which encircles and revolves about the central heater *A* in the annular space *G*. In this passage a separation is affected by melting of the sulphur, both it and the earth settling together upon the draining plate *H*, from which the melted sulphur drains and runs down into the steam-jacketed receiving pan *I* and overflows through a pipe *R* into the conveyor trough *O*, which leads the melted sulphur to any desired point. Operating in connection with the conveyor spiral *D* is another conveyor spiral *J* in the pan *I*, its action being to catch the earthy material discharged at the edge of the draining plate *H*, and also bring up along the bottom of the pan *I* the sediment from the melted sulphur, discharging both collections over the edge of the pan into the steam-jacketed trough *K*, and from it out through the chutes *M* into the refuse buggy *N*. The entire mechanism of conveyors is operated from a single pulley *F* and worm gear *E*.

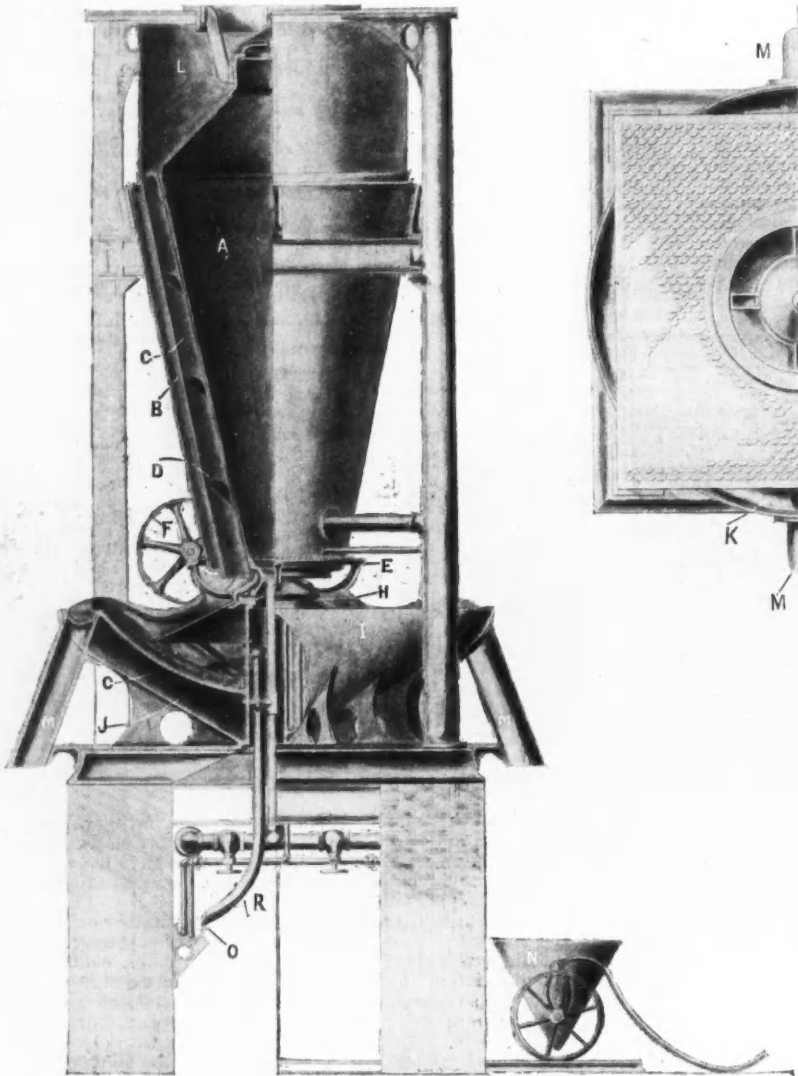
The cost of 1 ton (2,240 lbs.) of marketable crude brimstone, when the works are located at the mine and the annual production is at least 25,000 tons crude, is estimated below. The composition of ore is assumed as follows: Sulphur, 65%; moisture, 2%; earth, etc., 33%. The capacity of apparatus per day (24 hours) is 20 tons (2,240 lbs.) ore, or 8 lbs. per square foot heating surface per hour.

	Per ton.
Labor, including mining, handling, quarry to separator, removing and storing.....	\$1.20
Apparatus, based on 10 years' life, including repairs.....	0.15
Buildings, including all fixtures and repairs on same, except apparatus.....	0.07
Tools and implements.....	0.05
Fuel, coal or wood.....	0.15
Cost of management.....	0.12
Total cost.....	\$1.74

The specific heat of sulphur and of the earth materials usually found in ores being nearly the same, and the latent heat of fusion of sulphur being so small, the following ratio may be safely assumed in determining the cost of separation of one ton of crude brimstone from ores of different grade (or different per cent. contained mineral) but otherwise of like character and composition: Per cent. of sulphur in ore is to cost of reduction of unit quantity of any given grade ore as 100 is to cost of required separation. Taking the figures given above, \$1.74, as cost of reduction of 1 ton of 65% ore, we have— $65 : 1.74 = 100 : x$; that is, one ton of crude brimstone will cost \$2.68. In the same manner we find the cost for 50% ore \$3.48; \$4.35 for 40% ore, and \$8.70 for 20% ore.

Brick Roads.—Monmouth Township in Warren County, Ill., has completed 3,000 ft. of brick pavement as the first hard country road ever put down in the United States, says the *Clayworker*. The brick is single course, laid on 6 in. of sand, supported on each side by 2½ ft. of crushed stone. The cost was less than \$5,000 a mile. A three-mill five-year tax is imposed for payment of the improvement.

Another Arizona Meteorite.—Arizona is a favored region for meteoric irons. One recently acquired by the School of Mines at Tucson is described by Prof. W. P. Blake as a holosiderite, extremely compact and dense without crystallization; specific gravity over 8; cubic volume 4.790 cu. cm.; weight 86.5 lbs. or 39.216 kg. Its form is triangular, measuring about 12 in. on each side and it is 4 to 5 in. thick. It was found on the top of Weaver Mountain, Yavapai County, Arizona Territory. It is now undergoing a full investigation at the School of Mines at Tucson, Arizona.



WHITE'S APPARATUS FOR THE EXTRACTION OF SULPHUR FROM ORE.

the operator of efficiency relations, and concerns only monetary interests.

For example, a form of deposit in Sicily, allowing the use of the simplest mining methods, with an abundant supply of exceedingly low-priced labor, even in regions remote from shipping stations and in sections with sparse fuel supply, has been worked up to the present time with an annual production of from 400,000 to 600,000 tons of crude brimstone with good economical results, so far as concerns profits to mine operators. At the same time the efficiency of the method of extraction has not been over 40%, with an ore averaging hardly 20% sulphur. Forms of very much more efficient apparatus have been introduced in that same locality, but have not proven economical or profitable, at least for low-grade ores (20% to 30% or lower), obviously because on a diminishing scale of ore richness the cost of natural fuel, maintenance of plant, etc., per ton of sulphur produced, increases at a much more rapid rate than does the extra cost of labor and of sulphur consumed for fuel under the same circumstances with the Calcaroni system of extraction employed there.

As to the various methods in use for the mechanical separation of sulphur from earthy impurities; the conditions essential to successful Calcaroni working have been stated. The purer product obtained by distillation is rarely, if ever, extracted from natural ores, it being much more economical to perform the operation in two stages, using only the

THE STRIPPING AT MISSION COAL FIELDS, ILLINOIS.

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

This remarkable natural phenomenon is in Vermilion County, eight miles west of Danville, Ill. The area worked is an immense natural depression or basin, 80 ft. below the surrounding country, and comprises an area of about 1,000 acres. All of this basin is underlaid by a seam of coal 6 ft. in thickness. About one-half of the total area has been worked and the coal taken out. The land is owned by the Consolidated Coal Company, of St. Louis, but is at present operated under lease by the Butler Ballast Company, of Danville.

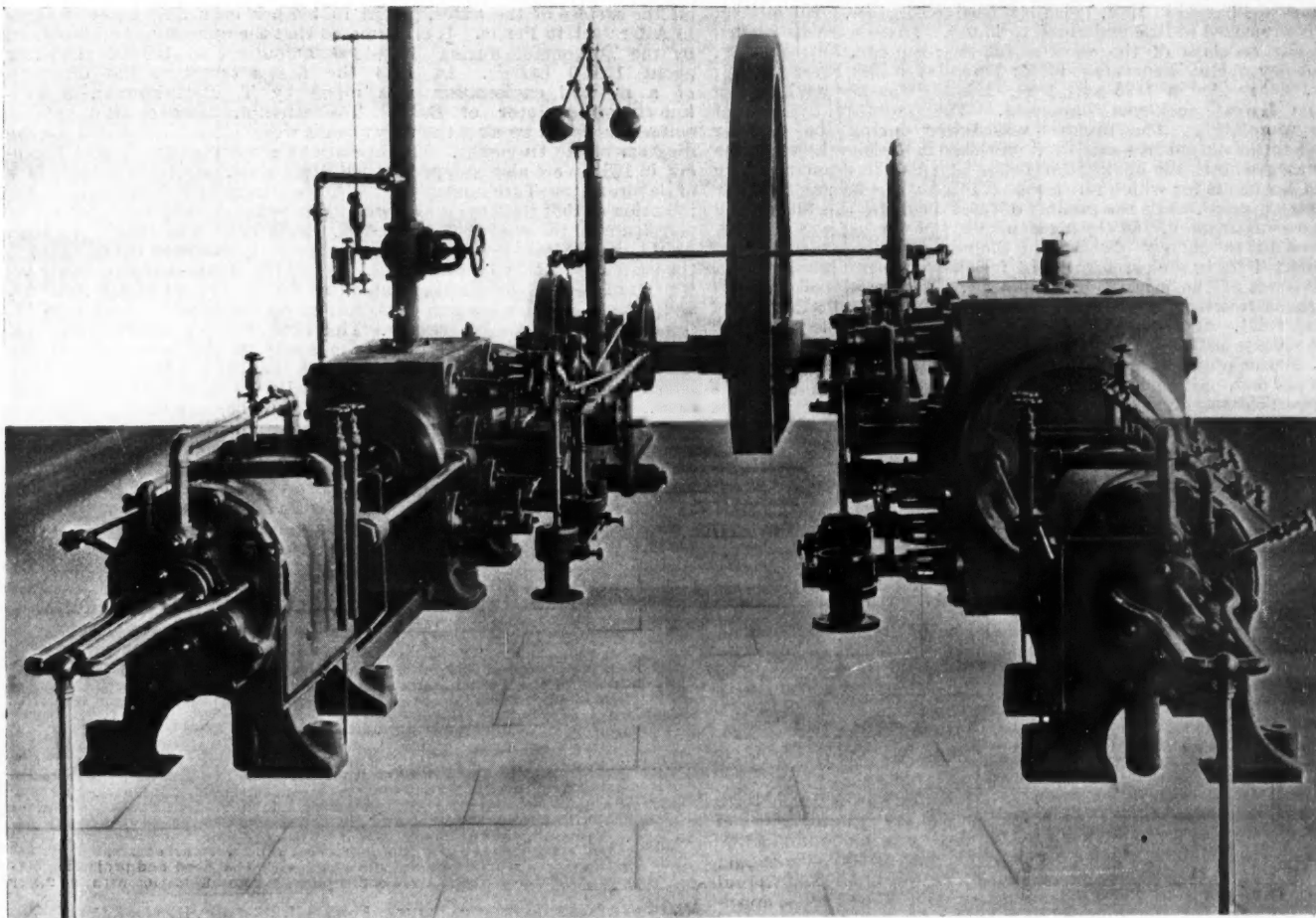
The coal is found at depths varying from 9 to 30 ft. and is overlaid by clay and gravel, and, in some places, soapstone. In working all overlying earth is removed by a machine invented by the Butler Brothers. An ordinary steam hoist furnishes the power necessary to operate the grading machine. A head-gear or tower 60 ft. in height supports a boom of piping, varying in thickness from 2½ in. in the smallest machines to 6 in. in the largest machines. To this boom is attached the shovel. It is made of steel, opens at the bottom and carries a load varying from 1½ cu. yds. in the smallest machine to 2½ cu. yds. in the largest. The shovel is emptied by means of a rope running from the operator to the shovel. As the work progresses the entire machine, which rests upon four 30-in. cast-steel wheels, running upon a track laid with 60-lb. iron, is moved backward or forward,

Spur tracks run into each cutting and the empty cars are brought in, and loaded ones taken out, by small locomotives. The trips vary from ten to fifteen cars each. These locomotives haul the coal to the foot of an incline leading to the railroad tracks, and ordinary first-motion engines hoist the coal to the tippel, from whence it is loaded into the railroad cars.

Coal from this field is soft and does not bear transportation as well as some other coals. It has, however, excellent qualities, and makes a very good steam coal.

A LARGE AIR COMPRESSOR.

The accompanying illustration shows a new air compressor recently completed and put in place at the Leonard shaft of the Boston & Montana Company in Butte, Mont. This compressor is intended to furnish air to run 20 drills in the mine. The engine is of the cross-compound pattern, the steam cylinders being parallel and at a short distance apart, as shown in the cut. The valve gear is of the Corliss type. The air cylinders are operated directly, one by the high-pressure and one by the low-pressure steam cylinder. They have a single inlet valve in each head, of the Risdon patent ring-inlet type, and are further supplied with the Risdon new patent unloading device. The water circulation is of the double system, two streams of water being kept constantly in circulation through the water spaces in the walls and heads of the air cylinders.



COMPOUND ENGINE, WITH RISDON PATENT AIR COMPRESSOR—BOSTON & MONTANA MINING COMPANY, BUTTE, MONTANA.

as may be necessary, by a friction clutch geared to the axles. The shovel is loaded and emptied by the raising and lowering of a 24-inch sheave wheel, attached to a ½-in. wire rope running to the top of the tower. The shovel is operated by gravity. This machine works toward itself, undermining its own footing, and delivering the dirt upon the opposite side of the cut. The machine is quite efficient, and the cost varies from \$5,000 for the smallest, to \$20,000 for the largest machines. There are three machines at work, and they run night and day, producing a daily output of 1,000 tons run-of-mine coal.

Upright horizontal return flue boilers of 80 H. P. furnish steam for the hoisting engines, and these boilers are carried on the same platform as the hoisting engine. The tracks supporting the machines vary from 10 to 18 ft. in gauge, the former using through ties, while the latter does not.

When the dirt has been removed from over the coal, holes are bored straight downward into the seam, and a very small amount of dynamite exploded at the bottom of the hole. This cavity is filled with powder and the coal is blasted off its bed.

In places the soapstone overlying the coal attains a thickness of 6 ft., and must be blasted, as the shovels cannot cut it. For this work ordinary coal-mining drills are mounted on trestles 6 ft. in height. A drill 16 ft. long is mounted on this trestle and horizontal holes 16 ft. in depth bored in the soapstone. Twelve sticks of dynamite are placed in each hole, and after the explosion the soapstone is easily handled by the shovels. About four hundred pounds of dynamite are daily used in this work.

The illustration shows the general arrangement of the machinery. The whole plant is compact and well designed and is a specimen of the latest machinery of this kind. It is expected to do good work in its present position. It is part of the additions which the Boston & Montana Company has been making recently to its working plant, and it will add largely to the working capacity at the Leonard.

This compressor was designed and built by the Risdon Iron Works, of San Francisco, Cal. That company is well represented at the Butte mines.

New Lake Vessels.—The Chicago Shipbuilding Company has received contracts to build three new steel vessels, two steamers and a tow barge, the total cost of which will be about \$400,000. The steamers are to be built for R. R. Rhodes, of Cleveland; they will be 240 ft. long by 42 ft. beam, with a molded depth of 24 ft. The engines will be triple expansion. The tow barge, which will be built for the Elphicke-Orr syndicate, will be a duplicate of the barge *Aurania*. It will be 352 ft. long on the keel, 44 ft. beam and 26 ft. molded depth. The three vessels are all expected to be completed by June 1st, 1897. A steel ship 400 ft long, of the same model as the *Queen City* and the *Zenith City*, is to be built for A. B. Wolvin and others, of Duluth, who own both those vessels and one other, now under construction. The two mentioned are the largest carriers on the Great Lakes, and the new one is to equal them. It will be built in Chicago.

MINERS' INSURANCE IN GERMANY.

The annual report on the working of the German insurance laws during 1895, which has recently been issued, contains a large amount of statistical information. It will be remembered that in Germany insurance is compulsory, and that three departments of insurance are recognized: (1) Insurance against sickness; (2) insurance against accident; (3) insurance against old age and infirmity. The system affects the whole of the wage-earning classes, but the mining population forms a distinct branch, which for purposes of classification is divided geographically into the following eight sections: (1) Bonn; (2) Bochum; (3) Clausthal; (4) Halle; (5) Waldenburg; (6) Tarnowitz, Upper Silesia; (7) Dresden, and (8) Munich. Since May 21st last the headquarters of the seventh section have been removed to Zwickau.

In order that medical aid may be expeditiously furnished, several of the sections have considered the advisability of erecting hospitals of their own. In the Bochum section the decision to adopt this course was arrived at in 1887, and a miners' hospital has since been erected at a cost of \$161,250. In the Halle district, a special hospital has been erected at a cost of \$187,500.

The number of works contributing to the fund in 1895 amounted to 1,765, as compared with 1,853 in the previous year. The number of workmen insured was 430,820, against 426,555 in 1894. The amount of wages, according to which the contributions are graduated, was \$95,818,615, or \$214.62 per workman, as compared with \$94,401,545, or \$212.52 per workman in 1894. The amount of relief paid was \$1,661,670 in 1895 and \$1,485,365 in 1894. In round numbers the amount paid out since the insurance law was passed in May, 1889, has been \$8,312,500. The number of accidents reported in 1895 amounted to 40,616. These were distributed over the various days of the week as follows: Sunday, 758; Monday, 6,357; Tuesday, 7,110; Wednesday, 6,545; Thursday, 6,595; Friday, 6,596; Saturday, 6,655. As in 1893 and 1894, Monday was the week day on which the fewest accidents happened. The monthly average of accidents was 3,385. The number was lower during the summer months when the output was small and increased in the months when the output was greatest, the maximum being attained in January. The number of accidents for which relief was granted was 4,906, or 11.39 per 1,000 persons insured, while the number of fatal accidents was 912, or 2.12 per 1,000 persons insured. Of the accidents for which relief was granted, 56.79% were due to inherent dangers in the mine, 0.96% to defects in the management, 4.02% to the carelessness of fellow-workmen and 37.24% to the carelessness of the injured man himself. The results of the accidents were as follows: Death, 912. Permanent disablement: Complete, 96; partial, 2,391. Temporary disablement, 1,507. The whole burden of insurance against accident falls on the employer. The amount paid is regulated by the annual wages of the men. When, however, the wages exceed \$1 per day, only one-third of the excess over \$1 is brought into calculation. The total cost of the accidents in 1895 in the eight sections was an average of \$5.09 per miner; or, put in another form, \$32.76 per \$1,000 paid in wages. The reserve fund now amounts to about \$6,250,000. The cost of management of the insurance fund last year was \$80,310, or 3.7% on the yearly expenditure.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

DUTY ON CYANIDE OF POTASSIUM.—In this case duty was assessed on cyanide of potassium at 25% ad valorem as a chemical salt under paragraph 60 of the customs law. Appellants claimed that it should be entered free under paragraph 443 as a coal tar product. The appeal was overruled and the assessment under paragraph 60 was sustained.—Schoellkopf, Hartford & MacLagan, appellants, vs. Collector of the Port of New York; United States Board of General Appraisers.

DUTY ON MINERAL POLISHING POWDER.—Polishing powder, a mixture of silica and lime, was classed under Section 3 of the customs law, and duty was assessed at the rate of 20%. Appeal was made under the ground that it should be classed as diamond dust or bort, and should therefore be free of duty under paragraph 467 of the law. The appeal was set aside and the assessment confirmed.—Schorestone Freres, appellants, vs. Collector of the Port of New York; United States Board of General Appraisers.

Electric Driving Briquette Presses.—At the briquette works of the Ilse Lignite Mine, near Bückgen, in the West Kottbus district, in Germany, the Schulz drying ovens, and also two new briquette presses, which make 120 revolutions per minute, have lately been driven by belt from electric motors of 50 and 75 H. P. The management is also taking into consideration the advisability of driving electrically the machinery of the ovens for drying the coal dust.

Gold Placers in Wales.—At Towyn, Merionethshire, it is reported that a remarkable discovery of gold-dust has been made in the estuary of the River Mawddach. Samples of sand have been taken in various parts of the river, and notably at Llanelltyd, Vachynys, and Bontddu. The sand and gravel are heavily charged with gold-dust. Valuable quartz has also been discovered in the bed rock. The river flows through the gold-yielding districts of Merioneth, and is in close proximity to the Clogau mine.

An Electric Smelting Furnace.—The Héruault electric furnace for making iron and steel, as employed at Neuhausen, has a basic lining (like that of a Bessemer converter), which is almost infusible, while being a non-conductor of electricity, and possessing the additional advantage of keeping the iron free from impurities. The sole or hearth of the furnace, which is insulated, forms the negative electrode, and may be constituted by carbon, or metal cooled down by a strong air-current. The positive electrode consists of four carbons arranged symmetrically round a vertical

axis, but inclined at an angle of about 20°. These four carbons may be raised so as to produce an electric arc, or may be lowered, so as to dip into the bath of molten metal, while they may also be turned forwards or backward so as to distribute the heat uniformly.

Apparatus for Drying Wet Coal Dust.—For several years the coal dust from the Emanuel Colliery, near Radlin, in the Ratibor Mining District, in Germany, was made up into briquettes in an unwashed condition; but, on account of the high ash content, the management determined to employ washed coal dust, to be dried in special apparatus. For this purpose a plate oven, 6 m. (19½ ft.) diameter, was employed, on to which the wet coal dust, already mixed with pitch, was delivered by an elevator. The drying was effected by an open fire, the heat and gases from which first pass over the revolving plate, and then under it into a flue, which leads the gases of combustion to the chimney. This contrivance, designed for turning out 200 tons of briquettes in 24 hours, has given good results.

New Petroleum and Ozokerite Fields in Russia.—For many years petroleum and ozokerite have been known to exist in the island of Cheleken, which is situated in the southeastern part of the Caspian Sea, being separated from the main land by a narrow channel, and having an area of about 700 square miles. According to a recent German report, the oil is forced to the surface by numerous springs of hot sulphur water (102° Fahr.), and accumulates in wells dug by the Turcomans. Long before European prospectors set foot upon the island, the natives were engaged in the production of oil and ozokerite. The ozokerite was separated from the rock by melting and sold in the market of Baku. The oil was skimmed off the surface of the water, placed in leather bags, and taken in skiffs to Asterabad, in Persia. It is estimated that the quantity of oil produced by the Turcomans during 1860-1880 amounted to 100,000 pounds, or about 12,000 barrels. In 1876 the first attempt in the direction of a rational exploitation was made by T. Palankowski, a well-known oil operator of Baku. The attempt, however, did not result successfully, because the upper sands were almost exhausted by the diggings of the Turcomans. The operations commenced by Nobel Brothers, in 1881, were also stopped after a short time, partly because of lack of labor, as the Turcomans refused to work; partly on account of the intention at that time to concentrate the production and manufacture of petroleum on the Apsheron peninsula. This field was then forgotten, until quite recently the attention of prospectors has been called again to the island, especially by the authorities of the Trans-Caspian territory, who were looking for a cheap liquid fuel for the Trans-Caspian Railway, and caused the resumption of operations on the island, which were accompanied by favorable results. The firm of Nobel Brothers has now resumed operations. Analytical tests made in the laboratory of the Technical Committee of Baku have shown that the crude oil of Cheleken Island possesses very peculiar properties. It is of thick consistency at 9° Cent., like salve, and becomes solid at a little below 0° Cent. Its water content is hard to eliminate, and this circumstance proves a serious obstacle in the distillation. Its specific gravity at 15° Cent. is 0.868, the flashing point 51.5° Cent. The residue possesses, at ordinary temperature, 22.5°, the consistency of salve or jelly, a specific gravity of 0.900, and can be worked up directly to vaseline. Another characteristic of this oil is its high content of paraffin, amounting to 5.5%, which, after being refined, furnished about 3% of white amorphous paraffin wax.

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 NOVEMBER 24TH, 1896.

- 572,011. **SMELTING FURNACE.** Herman Huber, Kansas City, Mo. The combination of a stack, a dust chamber separate from the stack, a downdraft-flue communicating with the dust chamber and extending upwardly and inwardly toward the stack and connected thereto, the downdraft-flue extending further upwardly parallel with the stack and having its upper end level with the mouth of the same, a hood embracing the mouth of the stack, and a flue communicating with the hood and projecting outwardly and downwardly, the flue being in communication with the upper end of the downdraft.
- 572,070. **TRANSFERRING APPARATUS.** Francis H. Richards, Hartford, Conn. The combination with a regulable supply device and a movably-supported receiving device, of a traveling conveyer between the two devices; driving mechanism for the conveyer; and means controlled by a movement of the receiving device, for automatically regulating the supply to the conveyer.
- 572,074. **HOLDING MECHANISM FOR MINING MACHINES.** William H. Slade, Columbus, O. The combination with a traveling frame, a chain-cutter carrying wheel journaled therein and holding-bars arranged on the frame respectively above and below the front end plate of the machine, and adapted to have imparted thereto alternate reciprocating motions entirely within the plane of the endless chain cutter.
- 572,092. **PROCESS OF MAKING ALLOYS.** Ernest A. Georges (called Charles Street), Paris, France, Assignor to the Electro-Metallurgical Company, Limited, London, England. The process of making alloys of metals of the chromium group with other metals, consists in melting the more fusible metal, introducing the chromium or similar metal and causing its solution in the fused metal, protecting the former at the moment of its introduction by a solidified coating or layer of flux, completely preserving it from contact with the atmosphere, the flux being of such a nature as to eliminate the small quantity of oxide that may have formed.

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 24TH, 1896.

- 16,303 of 1895. J. Cobeldick, London. Mechanical appliances for forcing solvents through tailings.
- 18,763 of 1895. M. Salvotte, Milan, Italy. Improvements in rotary rock drills.
- 22,732 of 1895. C. A. Burghardt and G. Rigg, Manchester. Improvements in process for recovering zinc and copper from zinc ores containing copper.
- 23,125 of 1895. J. H. Dickinson, London. In rock crushers forming the crushing surface of special sheets and making them removable.
- 23,543 of 1895. T. Parker, Wolverhampton and J. Pullman, London. Treating zinc ores with hot hydrochloric acid and keeping the solution neutral with carbonate of zinc and then electrolyzing to produce zinc and chlorine.

PERSONAL.

HON. T. MAYERS DALY, late Minister of the Interior, Canada, has been visiting Rossland, British Columbia.

EX-CONGRESSMAN ROLLIN M. DAGGETT, well known in mining circles, has opened a mining office in San Francisco, Cal.

PROF. E. DE GROPELLO, graduate of the University of Torino, Italy, has been appointed superintendent of the Union mill, at Phoenix, Ariz.

MR. FRED. REDMOND, assayer and metallurgist, has gone to Lion Hill, Utah, where he has accepted a position with the Northern Light Mining Company.

MR. MICHAEL LEVY, mineralogist, has been elected to the French Academy of Sciences to the seat of the late Gabriel Auguste Daubree, geologist.

MR. WILLIAM JONES, general manager of the Premier Tati Monarch Reef Company, Limited, has left Matabeland, South Africa, for Glasgow, Scotland.

COL. S. T. PEARSON, secretary of the Marion Mining Company, has returned to Salt Lake City from the Bingham placer mines, near Gibbonsville, Idaho.

MR. JOHN A. MILLER, of Idaho Springs, Colo., has been sent to the new gold-fields of British Columbia, to make a report for certain United States capitalists.

MR. R. BOYD DUNSMORE, who has been connected with the Hidalgo Mining Company in Parral, State of Chihuahua, Mexico, is now with the Detroit Copper Mining Company at Morenci, Ariz.

MR. H. S. MULLIKEN, superintendent of the Kootenay Mining and Smelting Company at Aurora, Ill., is now connected with the Guggenheim Smelting Company at Maurer's Station, N. J.

CAPT. B. Y. KIFE, of Port Vue Borough, has severed his connection as superintendent of the Jenkins coal works and taken a similar position with the John H. Jones coal firm, of Monongahela, Pa.

MR. A. J. VENTRESS has been placed in charge of the surveying at the Newhouse tunnel at Idaho Springs, Colo., during the absence of MR. W. H. WILEY, who is examining mining concessions in Korea.

MR. W. H. THOMAS and COL. H. G. HEFFRON, of the Niagara Mine, Bingham, Utah, have been in Cripple Creek, Colo., for a week examining mines. Mr. Thomas left for New York and Colonel Heffron for Arizona.

MR. L. W. MORGAN, mining engineer, of Los Angeles, Cal., has, for some time past, been in Mexico, where he was engaged in the examination of several silver and gold properties in Chihuahua for European capitalists.

MR. CHARLES F. HOFFMAN, mining engineer, of San Francisco, Cal., has been engaged by the London Exploration Company to go to Siberia and examine several mining properties. He will leave for St. Petersburg December 5th.

MR. MICHITARO OSHIMA, director of the Japanese Government Steel Works, whose arrival in San Francisco was recently noted in this column, has been engaged this week in visiting a number of the steel and iron works in Pittsburg and its neighborhood. It is said that he will purchase material for a steel-rail plant. He is accompanied by MESSRS. KISHO YASUNAGA, mechanical engineer; F. OBANA, engineer; J. TAKAYAMA, chemist, and K. KOMURA, of the Kamalshi Iron Works of Rikujū, Japan.

OBITUARY.

SPENCER C. BROWNE, mining engineer, died suddenly of heart disease at his residence, in Oakland, Cal., on November 23d. He was the son of the late J. Ross Browne, who was United States Minister to China for several years. Mr. Browne was interested in mines in Amador County and in Siberia.

HON. FREDERICK MILES died at his home at Twin Lakes, Conn., on November 20th, aged almost 81 years. He was born at Goshen, in Litchfield County, Conn., in 1815. Mr. Miles removed to Chapinville, Conn., in 1858, and later to Lakeville. He engaged in the manufacture of pig iron at Chapinville in 1859 and subsequently at Copake, Columbia County, N. Y., building Copake (charcoal) Furnace at that place in 1872 and operating it until his death.

THOMAS HODGSON, whose name in coal-dealing circles is known throughout the country, died in New York City on November 29th. For more than 40 years he had been connected with the Pennsylvania Coal Company. In that time he had risen from a subordinate place to the most lucrative offices in the company's service. For twenty years he was the Western sales agent of the company, and during this time he made his home at Buffalo, N. Y. A year and a half ago he was appointed the general sales agent of the Pennsylvania Coal Company, the acceptance of which made necessary his removal to New York City. Mr. Hodgson was born at Roxbury, Pa., in 1840.

BENJAMIN APTHORP GOULD, the astronomer, died November 28th at his home in Cambridge, Mass. He was born in Boston in 1824. Astronomy was his favorite study. He followed this under Carl F. Gauss in Goettingen, and in 1848 received the degree of Ph. S. Later he studied under François Arago in Paris, and he formed the acquaintance of the most noted scientists of the day. When he returned to the United States he started an astronomical journal which he published for 12 years. In 1851 he took charge of the longitudinal operations of the coast survey. He was one of the first to use the telegraph in determining differences in longitude. In 1855 he organized the Dudley observatory at Albany. In 1866 he established in Valentia, Ireland, the station from which the difference in longitude between Europe and America was ascertained, and he connected the two continents by precise observations. In 1868 he organized the National Observatory of the Argentine Republic in Cordoba.

SOCIETIES AND TECHNICAL SCHOOLS.

NATIONAL ASSOCIATION OF MANUFACTURERS.—The second annual convention of this association will be held on January 26th, 27th and 28th, 1897, at Philadelphia, Pa. The president will submit a report of the first full year of practical work in the lines mapped out by the original convention held in Cincinnati, January, 1895.

The Woodbury Concentrator Company reports the shipment of concentrators from San Francisco as follows: Fifteen to the Carson Creek mine, Calaveras County; two to the Eclipse mine, Placer County; two to Rosedale mine, Maricopa, New Mexico; two each to Mazatlan and Chihuahua, Mexico, and several to Australia.

NEW YORK ACADEMY OF SCIENCES.—A regular meeting of the Section of Geology and Mineralogy will be held in Hamilton Hall, Columbia University, December 21st, at 8 o'clock, p. m., at which papers will be read by F. C. Nicholas on "The Tertiary Valleys and Mountains of Eastern Columbia, S. A.," and by T. G. White on "The Quincy Granite Area, near Boston, Mass."

AMERICAN CHEMICAL SOCIETY.—NEW YORK SECTION.—The regular monthly meeting will be held at the Stevens Institute of Technology, Hoboken, N. J., on Friday evening, December 11th, at 8:15 o'clock. Addresses will be made as follows: Dr. Henry Morton, on "Some Illustrations of the Phenomena of Fluorescence;" Dr. A. R. Leeds, on "Exhibition of Appliances for Quantitative Estimation of Micro-organisms."

ANGLO-AMERICAN CLUB, FRIEBERG, SAXONY.—The report of the executive committee of this club for the winter semester 1895-96 and the summer semester 1896 has been published for distribution. At the close of the latter the membership was made up of 17 ordinary and five extra-ordinary members. The reports of the various officers show the club to be in an excellent condition. The addition of personal notes about various prominent people who are connected with the club in a friendly way and the personals about absent members add much interest to the report.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—At the meeting held at the society's rooms, 12 West Thirty-first street, New York, on December 2d, 400 delegates were present. Officers were elected for the ensuing year as follows: President, Worcester R. Warner, of Cleveland; vice-presidents, George W. Melville, of Washington; Charles H. Manning, of Manchester, N. H.; Francis W. Dean, of Boston; E. S. Cramp, of Philadelphia; S. T. Wellman, of Cleveland, and W. F. Durfee, of New York City; Treasurer, W. H. Wiley, of New York; Secretary, F. R. Hutton.

The following papers were read and discussed: "An Historical and Technical Sketch of the Origin of the Bessemer Process," by Sir Henry Bessemer; "Ancient Pompeian Boilers," by N. T. Bonner; "The Moment of Resistance," by C. V. Kerr; "Work Done Daily by Refrigerating Plant, and its Cost," by Francis H. Boyer; "Promise and Potency of High-Pressure Steam," by R. H. Thurston.

CALIFORNIA MINERS' ASSOCIATION.—President Neff, of this association, has appointed the following committees: Executive committee—El Dorado County, H. E. Pickett, A. H. Ten Broeck; Tuolumne County, E. C. Loftus, W. J. Sbarwood; Plumas County, J. H. Roberts, Samuel Cheaney; Trinity County, John McMurray, Fred Beaudry; Nevada County, J. S. McBride, E. J. Rector; Calaveras County, Matt B. Kerr, F. F. Thomas; Yuba County, James O'Brien, Joseph Durfee; Sierra County, F. R. Wehe, J. O. Jones; Santa Clara County, R. G. Bulmore, C. C. Durby; Siskiyou County, Andrew G. Myers, Albert H. Denny; Placer County, Harold T. Power, F. Chappelle; San Francisco County, Thomas Barbour, Tiry L. Ford.

Committee at Large—W. W. Montague, Louis Glass, R. McMurray, Charles G. Yale, R. B. Thomas, T. R. Church, Andrew Carrigan, Squire Mooney, John M. Wright, S. B. Christy, W. C. Ralston, E. Colman, S. J. Hedy, E. A. Belcher, Dan T. Cole, John Scott, George E. Ames.

Committee on Hospitals for Sick and Disabled Miners—F. Chappelle, chairman, Placer County; R. W. Thomas, superintendent Gwin mine, Calaveras County; Fred. Zettler, superintendent Champion mine, Nevada County; D. H. Jackson, superintendent

ent Larkin mine, El Dorado County; John W. Jeffers, superintendent Oleta mine, Amador County.

Committee on Revision of Mining Laws—Curtis H. Lindley, chairman; A. H. Ricketts, W. S. Keyes, C. W. Cross, Ross E. Browne, T. L. Ford, Henry Pichoir, J. F. Halloran, Fred Searles.

Committee on Legislation—Trey I. Ford, chairman; H. T. Power, S. B. Christy, Louis Glass, F. R. Wehe, G. H. Burnham, W. F. Prisk, E. H. Chapman, W. E. F. Deal.

Finance and Auditing Committee—Andrew Carrigan, Dan T. Cole, Louis Sloss, Jr.

Committee on Mineral Lands—A. H. Ricketts, chairman; J. F. Halloran, E. H. Benjamin, Harold T. Power, E. C. Loftus.

Advisory Committee to Debris Commissioner—C. W. Cross, chairman; John Spaulding, Mark B. Kerr.

INDUSTRIAL NOTES.

The Bethlehem (Pa.) Iron Company's converting and blooming departments resumed work November 30th.

The Mahoning Rolling Mill Company of Danville, Pa., has resumed work in its structural tubing department after an idleness of over a month.

The Ohio Steel Company, at Youngstown, Ohio, started a large plant on November 30th, and, it is expected, will run steadily until the holidays.

The Vulcan Iron Works, of San Francisco, have just shipped a 9-in. x 15-in. Giant rock breaker to Los Angeles, Cal., and two 8-in. x 10-in. breakers to Australia.

The American Sheet Iron Mill, at Phillipsburg, N. J., which has been idle several weeks, started up November 30th with enough orders to keep running all winter.

The Structural Steel and Iron Company, of Portsmouth, O., has been organized and will begin the manufacture of bridge work and other heavy structural material. It has already booked two contracts.

The Norwalk, Conn., Iron Works are about to erect a large addition to their present plant. They have purchased a piece of property about 300 ft. square, on which they will build a machine shop, 80 x 360 ft., one story high.

The Lehigh Zinc Company, of South Bethlehem, Pa., has started 24 fires in the C block of the oxide works. As soon as improvements at the bag-room are completed the entire block will resume work. Prospects are reported bright for steady work in the future.

The Edgar Thomson Steel Works of the Carnegie Company at Braddock, Pa., shut down November 30th for an indefinite period, no cause being assigned by the company. Five thousand men are thrown idle. It is stated that trouble in the steel-rail pool has caused the closing of the plant.

The J. H. McEwen Manufacturing Company, at Ridgeway, Pa., has assigned. This company has done a large business in McEwen engines for electric mining work, and it is to be hoped that the assignment, which is said to be due to slow collections, will hold for only a short time.

The Sharon (Pa.) Iron Company's furnace was put in blast December 1st, after an idleness of several months. About 125 men are affected by the resumption. The furnace has been completely repaired. The Alice furnace, at Sharpsville, is undergoing repairs and will shortly be put in blast.

The Henry R. Worthington Company, manufacturer of pumping machinery, has just received word through its London office that the exhibit of Worthington pumps at the Hungarian National Exhibition, at Budapest, has been awarded a Grand Millennium medal. This medal is the only award made for pumping machinery at the exhibition.

The Lebanon Manufacturing Company, of Lebanon, Pa., has completed an order for 500 hopper-bottom gondola cars of 60,000 lbs. capacity for the Philadelphia & Reading Railway Company. These cars are equipped with Fox solid pressed steel trucks, Schoen pressed steel body bolsters, National hollow brake beams, Gould couplers and Westinghouse air brakes.

Wharton Furnace, at Dover, N. J., has gone into blast. It was closed down in March last, and has since then been thoroughly repaired and put in first-class order. The furnace has a capacity of 1,000 tons of pig iron a week. The intention is to run on high-grade foundry iron, using 75% ore from the Hibernia mine in Morris County, New Jersey, and 25% Lake Superior ore.

The Rhode Island Locomotive Works plant, along Woonasquatucket River, has been placed under attachment for \$12,000 by the Midvale Steel Company, of Philadelphia. Breach of contract is alleged. The writ was served upon the trustees, Francis W. Carpenter, Cornelius Sweetland, Stephen Jencks and Edwin A. Smith. They have been running the works for several months. The company secured an extension of three years last spring. Locomotive building has been slow, and the depression caused financial trouble.

The Berlin Iron Bridge Company, East Berlin, Conn.,

has secured a contract from the Stamford Gas and Electric Company, Stamford, Conn., for a new power station which is to have a steel roof covered with corrugated iron lined with their patent anti-condensation roof lining. The engine and the dynamo room is 60 ft. wide and 100 ft. long, and the boiler-room adjoining is 40 ft. wide and 75 ft. long. The walls are of brick and the framework of the roof as well as the supports for the travelling crane in the engine and dynamo room are of steel. The Berlin Company has the contract for furnishing and erecting all of the structural steel work.

TRADE CATALOGUES.

W. E. Stieren, Pittsburg, Pa., dealer in architects', engineers' and surveyors' supplies, has sent us a descriptive catalogue of Johnson's slide rule, by means of which the unit stresses in columns can be quickly determined. Devices of this sort make tedious calculations unnecessary, save time and eliminate liability of error to a great extent, and are deservedly welcomed by those who are engaged in the class of work to which they can be applied.

The Wilbraham Baker Blower Company, Philadelphia, Pa., manufacturers of the Green and the Baker positive rotary pressure blowers and gas exhausters, describe these machines in a newly published catalogue. The Green blower, it is claimed, has a larger displacement per revolution, is much shorter, weighs less, and accomplishes the same work at less speed than the same size or number of positive blowers of other makes. The interior of the Baker blower is composed of three drums. The upper drum, to which pulley or engine is attached, does all the work of blowing or exhausting. The two lower drums are merely valves to prevent the air from escaping or returning.

The Risdon Iron Works, San Francisco, Cal., have published catalogue No. 5, describing the Evans Hydraulic Elevator and other hydraulic mining machinery. The principal features of the Evans elevator are the three suction, one main and two auxiliary—the two auxiliary allowing the water and material to enter at the back of the seat, thus reducing the wear and tear on the machine. The auxiliary opening also increases the efficiency of the elevator by allowing the proper proportion of air to enter with the water and material even when the main suction opening is choked.

Another catalogue has been issued by the Risdon Works, written in Spanish, and intended for distribution in Mexico and Central and South America. It explains the Bryan mill, the Blake rock-crusher and the Johnston concentrator.

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.

ALASKA.

JULIAN MINING COMPANY.—This company, which owns property on Johnson Creek, a short distance back from Berners Bay, is preparing to put up a 20-stamp mill. The company has also had surveys made and is arranging to build the first railroad in Alaska. It will be six miles long from the mines to the mill and thence to Berners Bay. The headquarters of the company are in Evansville, Ind.

ARIZONA.

GILA COUNTY.

LOST GULCH MINING COMPANY.—Work on this company's 10-stamp mill has been finished, and the stamps will soon be dropping ore.

YAVAPAI COUNTY.

LUKE.—This mine is said to be one of the best-paying silver properties in the county. About \$4,000 worth of bullion was shipped two weeks ago, while a carload of ore which will average about \$500 per ton, at the present price of silver, is ready for shipment.

ARKANSAS.

MARION COUNTY.

CHICAGO & LITTLE ROCK MINING COMPANY.—This company is mining zinc ore near Lion Hill. They have one crusher with steam jigs, with a capacity of 100 tons per day, in operation, and water enough to run five or six crushers. The company is capitalized at \$500,000. The mines are situated near the head of steamboat navigation on White River, which never freezes over, and 100 miles above Batesville. At Batesville the zinc ore is reshipped by the Iron Mountain Railroad to destination. This river is navigable for steamboats eight to nine months each year. Shipment can also be made by barges direct to New Orleans.

CALIFORNIA.

AMADOR COUNTY.

ARGONAUT MINING COMPANY.—This company is making arrangements to crush 500 tons of ore at the Zelle mill. In the Argonaut shaft they are drifting south from the 1,150, 1,250 and 1,350-ft. levels on good-looking ribbon rock 10 to 20 ft. wide. From 40 to 50 men are employed.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

CARSON CREEK.—At this mine, known as the "Old Jones," six miles south of Angel's Camp, 15 Woodbury concentrators have been put in, also a Damaret and Fuller air compressor, and the mill has been rebuilt, increasing the weight of the stamps. A chlorination works has also been erected.

QUARTZ GLEN.—This mine, one mile from Rich Gulch and six miles from Mokelumne Hill, is being worked under bond. The lower or south tunnel is in 250 ft., and an upraise has been made from the upper tunnel about 100 ft. to connect with the old works. A 20-stamp mill is kept running to prospect ore from different parts of the mine. A large amount of ore is in sight. The mill is operated by water under 700 ft. pressure taken from the Mokelumne and Campo Seco Canal.

WESTERN.—This mine, near Angels Camp, was worked in early days by the arrastra process. The shaft is down about 70 ft. on a vein 6 ft. in width. Assays show an average of \$25 per ton in gold.

INYO COUNTY.

(From Our Special Correspondent.)

The Prospective Mining and Drilling Company, of San Francisco, has shipped a Tremain steam stamp to H. W. Russell, of Mojave, for use in the South Park District.

KERN COUNTY.

LOS ANGELES GOLD MINING COMPANY.—This company purchased the Mammoth mines some months ago, and has just completed a 10-stamp mill, which is worked by a turbine wheel with water from the Kern River. The company also controls some other good properties in this State and Lower California.

(From Our Special Correspondent.)

UNCLE SAM.—C. C. Mathews has received at this mine, at Tehachapi, a Tremain steam stamp that was manufactured by the Prospective Mining and Machinery Company, of San Francisco.

NEVADA COUNTY.

(From Our Special Correspondent.)

PROVIDENCE.—At this mine on Deer Creek, one mile west of Nevada City, a clean-up of \$4,500 was made on November 18th, as the result of 10 days' run. The total for the month's run was \$12,000. The yield for October was \$8,000 from 200 tons of ore.

SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

Harrison & Willard are erecting a 10-stamp mill at Cuddeback Lake, about 14 miles from Randsburg to work custom ores from the Ravensburg and Fremont's Peak districts.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

GOLDEN CROSS.—At these mines, at Hedges, in the Cargo Muchacho District, a new body of ore has been found which runs over \$10 per ton. The shipments from these mines for October amounted to \$30,500.

GOLDEN DREAM MINING COMPANY.—D. K. Allen has been appointed manager of the property of this company, which comprises 30 claims in White Gold Basin, Old Pechacho District. A 10-stamp mill and other machinery has been shipped to the mines.

SHASTA COUNTY.

MOUNTAIN MINES, LIMITED.—These mines are working about 150 tons of ore per day with their big blast furnace and some 200 stall roasters which have lately been erected. A second blast furnace is being built, and it is the present intention of the company to build four or five altogether, and erect a total of 400 or 500 stall roasters. There are employed at the mine and smelter about 375 men.

(From Our Special Correspondent.)

SIERRA BUTTES CONSOLIDATED GOLD MINING COMPANY.—At the recent meeting of this company the following directors were elected: W. H. Martin, Peter Tautphaus, E. T. Liebricht, F. Boeckman and Robert Martin.

SYBIL GROUP.—These mines, in the French Gulch District, comprising the Monterey, Louise, Rosa and other claims, have been sold to a New York State syndicate. The sale was consummated by the owner, W. B. Murdock. These claims are known to be rich and the new owners intend to work them on a large scale.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

DISTLEHORST DREDGER.—This machine has moved down the Klamath River to a new station near Oak Bar and is said to have paid well wherever it has been located on the river.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

WHITTO.—At this mine, near Soulsbyville, the steam hoist has been completed, and exploration work will commence. This is an old mine; the

shaft is down 300 ft. and extensive work has been done in the levels and stopes.

COLORADO.

BOULDER COUNTY.

LOUIS GOLD MINING COMPANY.—This company has been incorporated, with general offices in the Medinah Temple Building, Chicago. The capital stock is \$2,000,000. The officers are Dr. F. W. Ihne, of Chicago, president and general manager; Col. Samuel Clay, Jr., vice-president; Chas. F. Cobb, secretary and treasurer. The company owns a valuable property, near Springdale, adjoining the Golden Age Mine, and is on the same vein. The mine has been sufficiently opened up to show its good qualities. Dr. Ihne, who is a well-known mining engineer of Chicago, will devote some of his time to the operation of the property.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

ADA.—Strikes of high-grade mineral have been made in this mine at the head of Virginia canyon. While drifting in a lower level a good body of ore was opened out and it is now being prospected.

ALICE.—It is reported that this mine, at Yankee Hill, has been sold to an English syndicate for \$25,000, but there is no way of confirming the report at present.

AMERICAN-SISTERS.—Because of the poor showing in development this mine, at Lawson, was turned over to lessees. They did very little prospecting until mineral was found. The streak of smelting ore is now 10 in. wide and worth \$130 a ton. The same ore body now shows in five different adit levels.

BRUCE.—Michigan people have bought this property at Idaho Springs and are opening it up through a shaft which has been sunk 300 ft. Levels are being commenced on a good body of low-grade ore.

DIAMOND.—This tunnel being driven at Silver Plume is now 500 ft. beyond the Corry lode. Two blind leads have been cut in the tunnel, but these will not be prospected at present. Development work on the entire group of claims is to be continued for some time.

FLORENCE.—A crosscut tunnel is being driven for this lode at Silver Plume. Two leads have been cut and one has been drifted on, but the tunnel proper is being pushed ahead again to reach the Florence, which should be cut at a great depth early in the year.

LORD BYRON.—This mine, at Idaho Springs, is being opened up through a shaft and adit level. The mineral streak is 2 ft. wide and nets \$30 per ton.

PELICAN.—The output from this mine, at Silver Plume, is not as heavy as usual. This is explained by the fact that since the consolidation more development work is in progress.

EAGLE COUNTY.

HOLY CROSS GOLD MINING COMPANY.—This company is now erecting a 50-ton cyanide mill, which was constructed for them by the American Cyanide Gold and Silver Recovery Company, of Denver.

EL PASO COUNTY.

HAPPY THOUGHT.—A new cyanide mill is being erected at this mine at Creede to treat the ores there obtained. The mill is being built by the American Cyanide Gold and Silver Recovery Company of Denver.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

COLORADO ORE SAMPLING AND REDUCTION COMPANY.—The American Cyanide Gold and Silver Recovery Company, of Denver, has contracted to erect a 100-ton cyanide mill at Elkton.

(From Our Special Correspondent.)

BOGART.—This mine, on Raven Hill, has come as a shipper after a hibernation of 18 months. It may easily be called to mind that in March, 1895, the lessee sold \$10,000 worth of mineral at an expense of \$100. The property has been worked almost continuously ever since, but no mineral has been found. A shaft has been sunk 300 ft., drifts extended, crosscuts driven, but no values were found anywhere. Two weeks ago a set of new lessees took charge, and in two days had discovered the vein. At a depth of 40 ft. a cross-vein appeared in the shaft, and it now seems that the values in the regular vein, as seen by recent developments, jumped to the cross-vein, where there is 4 ft. of ore, which sampled \$79 per ton. The ore chute has been opened for 15 ft. A shipment was recently made and two carloads will be shipped the coming week, and only one man working on ore in each shift.

CHICAGO & CRIPPLE CREEK TUNNEL.—Work has commenced under lease after a cessation of nearly five months, Mr. Alton L. Dickerman having charge of the work for the leasing company. Within a few hundred feet almost all the Gold Hill veins should be intersected at a depth of 650 ft.

C. O. D.—The shaft has been sunk 400 ft. and the amount of water in it is about 25 gals. per minute. Four months ago additional pumps were fixed capable of lifting 1,000 gals. of water per minute; also a 10-inch column was indispensable, but to-day the mine is almost dry. It is the impression that the Abe Lincoln and Arcadia mines drain the C. O. D., but neither of these are as deep as the C. O. D., and the rock between the properties is not of a porous nature. The C. O. D. has not been a prolific shipper this year.

CRIPPLE CREEK CONSOLIDATED MINING COMPANY.—The Geneva, on Gold Hill, owned by this company, and worked on lease by Messrs. Tutt & Penrose, is a steady shipper of about 40 tons of 2-oz. ore per week. It is reported that a new ore chute has been found at the bottom of the shaft 420 ft. deep.

ELKTON.—The owners of this mine, on Raven Hill, have received returns for \$15,000, the result of a week's shipment. The ore sent to the cyanide mill sampled \$26. The output is about \$50,000 and the average of the ore sent from the mine during the last six months, even including the low-grade ore, has been close to \$130. The 3d and 4th Elkton levels have been driven on in the Walter ground about 440 ft. and the vein shows well.

GRANITE HILL.—A strike 4 ft. wide is reported on this property in Poverty Gulch, with assays ranging from \$300 to \$1,700 per ton, which is somewhat exaggerated. The vein is of fair size, but it does not average as reported, although 4 in. or 6 in. of the vein assays as stated. The vein looks in place at the present depth of 120 ft.

HALLETT & HAMBURG.—It is reported that a rich strike has been made here, consisting of 4 ft. of \$150 ore.

HENRY COLBY.—This mine, on the west slope of Bull Mountain, and located in the granite, is now a scene of activity. Four sets of lessees are searching for an ore chute, and one set of lessees are piling up ore from a 10-ft. shaft. The vein has a north and south course. The claim is under lease and bond to Messrs. McCoy & Houlihan.

IRISH MOLLIE.—This property is owned at present in St. Louis. Recently a contract was let to sink the north shaft an additional 200 ft., the present depth being 150 ft. A steam hoist is to be erected at once. The south end of the claim is being worked on lease. On this part of the property the company expended fully \$6,000, but without making shipments. The lessees have not yet found the ore in paying quantities. The shaft has been sunk 150 ft. This part is equipped with steam hoist.

JEFFERSON MINING COMPANY.—This company, owners of the Mattie L., on Gold Hill, has leased the south end of the claim to Mr. Walter Head, of Cripple Creek, who has been leasing in this camp for two years. Mr. Head intends to sink a shaft 300 ft. deep, as there are a series of veins on the claim.

LEXINGTON MINING COMPANY.—The Clara D., on Gold Hill, owned by this company, is worked under lease. The shaft has been sunk 150 ft., and the vein in the bottom looks encouraging.

LITTLE MAY.—This mine, on Beacon Hill, under lease and bond, is shipping from 12 to 20 tons of low-grade ore daily the ore having a value of \$14 to \$18 per ton. The shaft has been sunk 104 ft. and the vein is fully 20 ft. wide. Negotiations are in progress for the purchase of the lease.

MARINETTE MINING COMPANY.—The Abe Lincoln, owned by this company, has become a shipper. This claim is located in Poverty Gulch, and was recently in conflict with the Arcadia Company. The ore is precisely the same in character as that found in the De Witt lease and the Arcadia mine.

ORPHAN BELLE.—This property, on Bull Hill, has shown much improvement, an ore chute having been found at the depth of 200 ft. by one of the lessees. Machine drills are now being put at work to prove its extent. It is reported that an English company has secured an option on the Orphan Belle properties until December 15th. There are six steam hoists at work, all erected by lessees.

PRINCE ALBERT.—This mine, on Beacon Hill, ships one car of ore daily to the smelter. The ore is of medium grade, averaging close to \$60 per ton. The width of the vein at this particular point is 20 ft., and all mineralized. This property is worked under lease by Messrs. Babbitt & Keating.

SOUTH PARK.—This claim, on Iron Clad Hill, is now equipped with a steam hoist. Mr. Charles Hill, of Leadville, is manager for the owners, who are Pennsylvania capitalists. The shaft has been sunk 150 ft., but the ore thus encountered has been low grade.

W. B. H.—This claim, located on the north slope of Bull Hill, and worked under lease, promises to do well. The shaft has been sunk 110 ft., and in a drift 30 ft. north from the bottom of the shaft several shipments of low-grade ore from \$20 to \$30 per ton have been sold.

GILPIN COUNTY.

(From Our Special Correspondent.)

BARNES.—The Gilpin Tramway has put in a switch to this mine, on Quartz Hill. The bottom workings of the Barnes show a fine pocket of \$15 to \$20 ore, which is about 5 ft. wide in the shaft.

COLUMBUS.—The shaft, now 175 ft. deep, is being sunk in a fine-looking body of ore, which is at present, however, of very low value.

FIRST CENTENNIAL.—This property, in Chase Gulch, is shipping about 200 tons of good-grade ore per month, with a working force of 20 men.

NIAGARA.—No work is being done on this mine beyond keeping the water hoisted.

NOTAWAY.—A new and roomy shaft-house has been placed on the old McLeod shaft, which is being straightened out for permanent work. As soon as the hoisting plant is in position it is intended to commence vigorous development work.

REVIEW.—This mine, on Winnebago Hill, is being reworked, the water being pumped up through the Winnebago shaft to the Belden adit tunnel.

TWO-FORTY.—From this mine, in Willis Gulch, some \$10,000 or \$12,000 have been taken during the last few years above adit level, while a good deal of ground yet remains available for stoping. The work done shows a continuous pay-chute nearly 500 ft. long and on an average 18 in. wide. A shaft was commenced last winter to go down below the tunnel level. An engine chamber was blasted out in the tunnel, and a good hoisting plant erected, with the aid of which sinking will now be recommenced.

GRAND COUNTY.

COPPER DISCOVERIES.—It is reported that copper veins have been discovered about 20 miles below Dillon, on the Blue River. The veins give from 18% to 22% in copper and are from 2½ to 8 ft. in width. A number of claims have been located.

GUNNISON COUNTY.

FOREST HILL CONSOLIDATED MINING COMPANY.—A consolidation has been effected of the Forest Hill Mining and Milling Company, the Gold Field Mining and Milling Company and the Golden Fleece Mining and Milling Company, which will hereafter be known as the Forest Hill Consolidated Mining Company. Under the new organization the company will be incorporated for \$3,500,000, and their plant will be operated under one management. The Gold Field Company is a corporation of Ironwood, Mich., and the Golden Fleece Company includes prominent men of Canton, O. The Minneapolis Company has already expended \$60,000 in developing their mines. The election of officers was held, L. Cavanagh, president of the Forest Hill Company, being retained as head officer of the consolidated company; J. A. Preston, superintendent of the mine, was also re-elected. Three directors from each of the old constitute the new directory, which is as follows: L. C. Cavanagh, E. M. Christian, Minneapolis; P. P. Stoltzman, Rhineland, Wis.; H. A. Cavanagh, D. Biedale, W. J. Soper, Canton, O.; J. C. Jensen, C. P. McNeil, J. A. Preston, Hurley, Wis.

HINSDALE COUNTY.

HIWASSEE.—This 500-ft. tunnel has been driven with good results. The Hiwassee vein was cut at 490 ft., and drifts will be started at once in both directions from this crosscut. The depth of 200 ft. gained by the tunnel has shown the stability of the ore bodies, and a mill run gives 8 oz. in gold as the value.

JEFFERSON COUNTY.

SWANSEA SMELTING COMPANY.—This is the name under which the parties who recently constructed a smelting plant near the Bear Creek gold-copper mines have incorporated the enterprise. The capital is \$100,000. Work has been going forward for some time with more or less profit, the plant being operated on an experimental basis. The incorporators are W. E. Van Alstine, S. A. Van Alstine, Thomas H. Edwards, F. N. Handy and W. J. Kram.

LAKE COUNTY.

(From Our Special Correspondent.)

LEADVILLE STRIKE SITUATION.—I had hoped to be able to report this week that despite the strike the down-town mines were ready to start up. However, there seems to be a hitch in the proceedings somewhere, and the pumping proposition has not yet been satisfactorily settled. It is learned that nearly all of the signatures have been obtained to the agreement already described in these columns, but several signatures which are absolutely necessary have not yet been obtained.

For the past two weeks there has been no move in the strike situation, and the mines which are working with imported men are shipping and carrying on development work under the protection of the State militia. John and George Campion, of the Ixex and the Chip and Bison, informed me that the new men are doing better work by far than they have had out of the union man for the past two years. I also learn from Manager Mudd, of the Small Hopes group, that he is increasing his shipments daily and that the new men are giving satisfaction. I have it from very good authority that if the pumping deal is fixed up this month and the down-town mines are started, none of the managers will employ any of the union men, and non-union men will be imported if necessary. These properties will employ about 500 men.

LACKAWANNA DISTRICT.—Mr. F. J. Robinson has just returned from this district, where he has been doing considerable development and prospect work. The district is located about 20 miles west of Leadville in the heart of the Continental divide, and the veins there, which are fissures with granite and porphyry walls, possess largely the characteristics of the veins in the Twin Lakes section. Mr. Robinson has been developing the Morning Star, the Golden Star, Nicholas Lode and the Robinson placer. He has closed down for the winter. The claims are opened up with three tunnels and two inclines, one 190 ft. in length, and showing a 3 ft. vein in the bottom, some assays of which run high. The ore is quartzose in character, free milling and can be treated at the mine.

RESURRECTION MINING COMPANY.—Manager Carnahan has started up this property with a small force of non-union men and intends to increase this force as it is found necessary. The Resurrection is one of the most important of the Gold Belt enterprises, developing an entire new territory, which

promises much to the prosperity of the camp. There are also a number of other good properties in this neighborhood which will be developed.

OURAY COUNTY.

(From Our Special Correspondent.)

Agitation consequent upon the recent election having subsided, the larger properties are settling down to a steady production of the precious metals. All the old properties, with the exception of the Guston, St. Paul and Robinson, are working steadily, though with diminished forces. The above-mentioned mines, three of the largest producers of the county, suspended operations about November 1st, ostensibly to await the outcome of the election, the St. Paul and Robinson management intimating that in case of Republican victory the force would be increased and new improvements made to the extent of at least \$100,000. However, immediately upon the result becoming known the few men remaining employed were discharged and the works shut down for the winter; 300 more men are thus added to the large number unemployed.

ALADDIN.—A 12-in. streak of gold quartz has been disclosed in the red lime-shale, samples from which indicate a body of gold ore. Late assays have given excellent returns. The Aladdin is owned by J. F. Saunders and Murphey & Sons, who are also pushing the tunnel on the Bachelor No. 2, adjoining, from which some good ore is being taken. A large force of men is pushing operations on both properties.

CALLIOPE MINING COMPANY.—This company is erecting a large mill, intended to handle the increased output of that property, resultant upon the recent disclosure of several large ore bodies.

DENVER.—Lessees have just shipped a large consignment of rich ore from a "knife-blade" streak, at an excellent profit.

FOWLER MATTE SMELTER.—Mr. Fowler, a wealthy capitalist of Chicago, has let contracts for smelting machinery, amounting to \$50,000, for a new smelter under process of erection just north of Ouray. The projection is at the head of the Cleopatra Mining Company, the output of whose mines will supply a large share of the patronage of the new plant. The smelter will also do custom work, and by a new process adapted to the economic treatment of the very low-grade ores in this district.

GEM.—A strike is reported from this mine, near Ouray, owned by Story & Stevens, of that place.

GRIZZLY BEAR.—The new bridge is finished and the ore-house is about completed. The new trail, recently constructed in order to avoid the toll road, will be kept open as long as possible during the winter.

IOWA CHIEF.—The tunnel is being pushed rapidly in order to catch the Bachelor vein.

LADY ELLEN.—County Treasurer Seegur has made an excellent strike, samples exhibiting wire silver in profusion.

NEOSHA GROUP.—Ed. Nazro and others are taking out ore for a mill run from a 4-ft. vein recently struck, and will ship in a few days. The Neosha adjoins the Aladdin and is believed to be a continuation of the Aladdin vein.

PONY EXPRESS.—The new mill is now complete and the machinery is being put in place. Miners have also been put to work breaking ore preparatory to beginning treatment.

SILVER BELL.—A large body of gray copper and bismuth has been discovered 300 ft. from the old workings.

U S. MILL.—Once more this mill has been shut down indefinitely, its last lease of vitality extending over a period of only a few weeks. Lack of ore and other complications are assigned as the cause.

YANKEE BOY.—A force of 25 men has been put on at this mine for the winter, and shipments will be continued.

CONNECTICUT.

NEW HAVEN COUNTY.

NORCROSS BROTHERS.—The granite quarries of this firm, at Stony Creek, increased operations to full time on November 30th with 200 employees, the full complement.

IDAHO.

BLAINE COUNTY.

STAR.—A strike was made recently in the back ledge of this mine and at a depth of about 250 ft. from the surface. The vein is of solid galena ore and said to be 3 ft. thick. The ore is a steel galena with ribbons of cube and leaf galena. The steel galena contains gray copper.

IDAHO COUNTY.

RESCUE AND IDAHO.—It is reported that these quartz mines, near Warren, have been sold to a company in Boston. Price is said to be \$6,500 for the Rescue and \$4,500 for the Idaho. The company proposes to erect a hoist at once and continue work on a shaft that has already been sunk to a considerable depth.

LATAH COUNTY.

CHECKMATE.—A rich strike was reported in this mine at Willow Creek, recently. The owners of the mine were compelled to suspend sinking when they reached a depth of 125 ft. on account of water, but they have been drifting and stoping on the ledge east and west for about 400 feet and at both ends of the ledge the ore has increased in richness. The re-

cent rich strikes were made at both ends of the mine.

OWYHEE COUNTY.

TRADE DOLLAR AND BLACK JACK GROUPS.—The Blaine tunnel of the Trade Dollar group, driving north, and Idaho tunnel of the Black Jack group, driving south, have been connected, thereby making an opening clear through Florida Mountain. The Blaine tunnel is 4,317 ft. in length and the Idaho tunnel 3,200 ft., making a total of 7,517 ft. or nearly one and one-half miles. The tunnel cuts the mountain at a depth of 1,200 ft.

SHOSHONE COUNTY.

BELLE.—This group, in Pierce City, has been incorporated at \$250,000. A 5-stamp mill is now on the way from Spokane, which will be put up immediately and run through the winter.

INDIANA.

JAY COUNTY.

REVERE OIL COMPANY.—This company, of Portland, Ind., has disposed of its interest in the Indiana oil-field to the Northern Indiana Oil Company; price said to be \$35,000.

KANSAS.

CHEROKEE COUNTY.

(From Our Special Correspondent.)

CONSOLIDATED COMPANY.—This company has a large concentrating plant on the Battlefield land and is drifting at 95 ft. on a 40-ft. face of disseminated zinc ore. They are producing from 40 tons to 60 tons of high-grade zinc ore each week. During the night they concentrate ore for the adjoining miners.

MATHEWS & COMPANY.—The company's 80-acre lease of the Bonanza land is proving rich. Every shaft down over 100 ft. has developed a large face of ore in open ground. It is easy sinking a shaft as it is open ground all the way, and the company keeps the ground drained. They have a large steam concentrating plant, and with dirt from one shaft are making from 70 tons to 100 tons of high-grade zinc ore each week.

McKENSEY COMPANY.—On this lease of 20 acres of the Muir land, west of Galena, several shafts are going down. In two of them a good run of lead ore has been opened at 8 ft. in open ground, and in another, at 50 ft., they struck a good body of zinc ore in hard ground.

SPRING RIVER COMPANY.—This company has been at work steadily since last March, but without any success until three weeks ago. The pump shaft was sunk to 75 ft. and some drifting done on slimes. Enough ore-bearing rock has now been taken out to make a dividend, with a 15-ft. face of ore to cut on. The ore is a high grade.

MICHIGAN.

COPPER.

It is reported that the Isle Royale, Portage, Huron and Sheldon and Columbus mines have been transferred to German capitalists, represented by Nathan F. Leopold, of Chicago, for a consideration of \$138,000. The mines have been idle for 20 years. They will be opened and developed on a large scale.

QUINCY MINING COMPANY.—This company reports an output of 864 tons of copper in November, which compares with 850 tons for October, and 1,046 tons in November of last year.

IRON—MARQUETTE RANGE.

CLEVELAND-CLIFFS IRON COMPANY.—At this company's Salisbury mine, near Ishpeming, there have recently been evidences of a breaking away from the diorite bluff beside which the present engine-house is located, and special precautions have been necessary to prevent the loss of the shaft. The ground that has been moving is 700 ft. in thickness and its settling has been gradual but constant. The diorite, which rises abruptly at the side of the present engine-house, is the hanging wall of the ore to the lowest depth yet reached, but it is thought to be a capping rather than a true hanging wall. The new shaft, which it has been decided to put down, will have its mouth, according to *Iron Ore*, beside the old open pit working. It will incline southward, with the formation at an angle of 53°, being in the diorite. It will have three compartments, one for pipe and manway, 5 ft. 6 in. by 6 ft.; one for skip, 5 ft. 1 in. by 6 ft., and one for timber, 6 ft. x 6 ft. The shaft opening outside of timber will be 9 ft. x 22 ft. Drifts from the 5th, 8th, 12th, 14th and 16th levels will be run west to intersect the line of the shaft, and the latter will be made by raising from these levels, this system being less expensive than that of sinking.

IRON—MENOMINEE RANGE.

COMMONWEALTH IRON COMPANY.—This company has taken an option on the Bessie mine, Humbolt, and preparations are now being made for a resumption of operations. O. C. Davidson, superintendent of the company, visited the mine and ordered the pumps started. The property has been idle for three years.

MINNESOTA.

(From Our Special Correspondent.)

The change that has taken place in the mining districts of the State since the election is something almost beyond belief. Then there was scarcely a mine at work; now all the mines on one of the two ranges are busy, and half those of the other, leaving idle but few others than those that operate by steam shovel and would under any circumstances

be quiet in the winter season. Mining men predict a very active season in 1897, and intend to have good stocks of ore at the opening of navigation. At some properties a slight advance in wages has taken place. By reason of this betterment there has been an influx of men from other sections to the ranges, but they are unable to find work, as the mines are making it a point to re-employ their old hands, and so far even a few of these are yet unplaced. Indications are that at both the Vermilion range towns of Tower and Ely and at all Mesabi towns except Biwabik there will plenty of work for all local men all winter.

Iron ore shipments are about over from Minnesota and Lake Superior; ore is freezing in the pockets, and it is hard work to get it into vessels, and freight rates have gone to 90c. a ton on account of the demand for room for grain, which is going out of Duluth at the rate of 2,000,000 bu. a week.

Another suit has been begun in the famous Section 30 case, the Germania Iron Company suing the Minnesota Iron Company and those from whom the latter has title to 40 acres of the tract, claiming the equitable ownership to rest in Emil Hartman. The land has already been patented to the Minnesota Iron Company.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

CINCINNATI IRON COMPANY.—A few more men are being given places and the wages of those at work have been raised 10%. The company is shipping some ore on a late sale of non-Bessemer.

COMMODORE MINING COMPANY.—This company is hoisting and shipping about 1,000 tons a day from its developments, and will employ nearly 200 men in the winter. Surface improvements have been made during the fall and the mine has now as good an appearance as any in the district.

FAYAL IRON COMPANY.—This company has put 200 men at work and will hoist largely during the winter. The force will be increased later. About 75,000 tons of ore are now in stock.

FRANKLIN MINING COMPANY.—This group, including the Franklin, Bessemer and Victoria shafts, has resumed and will soon have 500 men at work. Already 150 are employed.

LAKE SUPERIOR IRON COMPANY.—At the three mines of this company at Hibbing more men are being added weekly, and day and night shifts are now run at all three. The pump shaft of the Hull is being connected with the working shaft of the Rust, 1,300 ft. away, in order to carry the entire body of water at the latter to the Hull pumps. At the latter shaft there are eight powerful pumps, including two mammoth condensers, capable of handling about 3,000 gals. a minute. All the pumps of the two will be centered at the Hull shaft.

MOUNTAIN IRON COMPANY.—At this mine stripping, both by hand and shovel, has been resumed, and 50,000 cu. yds. will be moved, and more if the weather holds good. As the company has now about 25 acres stripped and open for mining, there was no immediate necessity for adding to this area, but there was no work going on in the town.

OLIVER MINING COMPANY.—This company has stripped about 55,000 cu. yds. of earth since the close of its shipping season, and is getting in readiness to ship next year up to 1,000,000 tons if requirements demand. Its shipments this year were about 33% strictly Bessemer, and most of the rest of a grade excellent for mixing with low phosphorus ores.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

CHANDLER IRON COMPANY.—This company has put 400 men at work in its shafts at Ely, and will stockpile all winter, having made new grounds. The mine has about 110,000 tons yet in stock from last year, and will probably have 400,000 tons at the opening of navigation.

MINNESOTA IRON COMPANY.—Orders have been received from President D. H. Bacon to resume work at the hard-ore mines at Tower, which have been idle for about 60 days. All but one or two shafts will resume, and from 800 to 900 men will be given work. It had generally been believed that the company would reopen its workings soon, but this early resumption is very gratifying to all that part of the State.

The company has set men at work exploring a 40-acre tract of Section 30, which has lately come into its possession, after 15 years of litigation. It is the first decisive work ever done in the section in the way of explorations. The 40 acres are supposed to be very rich in iron, and development will probably be pushed if not impeded by further lawsuits, one of which has already begun.

ZENITH MINING COMPANY.—This company will resume work at its mine at Ely as soon as places can be made for the men underground.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The output of ore in the district was light last week on account of Thanksgiving day and two days of stormy weather and bad roads. The shipment was 21 cars less than the preceding week, but an increase of 26 cars over the corresponding period last year. The lead sales decreased 4 cars from the preceding week, and were 6 cars less than the same period in 1895. Twenty-six dollars per ton was paid for zinc ore for a third of the Joplin shipment, and the total Joplin sales averaged fully \$25. The

price paid for zinc ore at Galena, Kan., was from \$15 to \$25 per ton, the top price paid at Webb City and Cartersville was \$26, with an average of over \$21 per ton. The Alba zinc ore sold at \$25. Last year the top price paid for zinc ore was \$22 per ton. Lead ore advanced Saturday to \$15.50 per thousand pounds delivered, and most of the Joplin product brought that price. At the other camps it brought \$15 in the bin. The same week last year it brought \$17.50 per thousand pounds. The following was turned in from the different camps: Joplin zinc, 957,760 lbs.; lead, 179,870 lbs.; value, \$14,758. Cartersville zinc, 1,024,860 lbs.; lead, 193,600 lbs.; value, \$14,258. Webb City zinc, 508,270 lbs.; lead, 47,860 lbs.; value, \$6,318. Galena, Kan., zinc, 2,930,000 lbs.; lead, 415,000 lbs.; value, \$34,525. Aurora zinc, 589,000 lbs.; lead, 43,400 lbs.; value, \$5,154. Alba zinc, 88,000 lbs.; value, \$1,100. Zincite zinc, 14,230 lbs.; value, \$142. District totals for last week: Zinc, 6,113,120 lbs.; lead, 884,790 lbs.; value, \$77,250. District totals for 48 weeks: zinc, 274,599,210 lbs.; lead, 49,685,080 lbs.; value, \$3,483,233.

ATTIE R. COMPANY.—This company is drifting at 144 ft. on a large face of zinc ore in soft ground and producing three carloads of zinc ore each week, which they clean on the Horse Shoe plant.

AURORA MINING COMPANY.—This company has one lot on the Circle lease at Oronogo, where they are drifting at 130 ft. on a 29 ft. face of zinc ore in shooting ground.

BROTHERHOOD OF LOCOMOTIVE ENGINEERS MINING COMPANY.—This company has leased 24 acres of the Wilkes land situated 1½ miles south of Fourth street, Joplin. Five producing shafts and several prospecting shafts are going down, and are developing zinc ore at 70 ft. to 107 ft. in open ground with but little water. The company's shaft is 107 ft. They have a 27-ft. face of zinc ore, and good ore in the bottom of the shaft.

BUNKER MINING COMPANY.—The company has the water out of the mine on the lease at Cottonwood Hollow, two miles west of Joplin. They have put up a steam hoister and have a large face of ore at 120 ft. They will concentrate the ore with crusher and rolls on hand jigs.

CENTER CREEK COMPANY.—The company is having Ben's branch cut deeper, and is running the dirt taken out through its plant, which is paying the expenses of the improvement. For six months the company struggled against the flood of water that overran the ground last May. It is now all out and every mine and plant is working. Hood, Pyle & Company are running their plant steadily. Parker Bros.' shaft has been sunk 15 ft. in rich zinc-bearing dirt. Ford & Owens on the McConey lot are preparing to start. When the flood came they had just developed a large face of ore. Beasley & Company are working the lower ground on a large face of zinc ore. Wolf & Cozard on the Auker lot are producing again and Baker & Company on the Case lot are hoisting good pay dirt. M. L. Harden is putting up a crusher and rolls on the Aylor lot, which has been rented to West Virginia parties who also have the Miles lot adjoining. Mr. Harden will clean the ore on contract. Pepper & Company are working the O'Neil lot and are taking out rich zinc dirt.

CORKSCREW MINING COMPANY.—This company has developed a good prospect on the lot adjoining the Jackscrew mine. A body of zinc ore has been found that is fully equal to the development of the latter some weeks ago. From 104 ft. to 112 ft. they went through rich zinc ore and are still sinking in rich dirt.

DERMOTT & GUNNING.—They have leased 10 acres of the Granby Mining Company at Oronogo, where they have a steam concentrating plant. A runway has been built from the north shaft to the plant, and will start at once. A good face of ore has been developed in three shafts at 70 ft., 80 ft. and 100 ft. in shooting ground. Several lots have been sub-leased and most of these have developed ore in paying quantities.

ELEVENTH HOUR COMPANY.—Two 16-in. Cornish force pumps are being put on the lease southeast of Webb City. They were made by the Webb City Iron Works. The company is composed of J. W. Aylor and A. W. Aylor, of Webb City. The lease is valued at \$500,000 and runs for nine years more. In sinking the pump shaft deeper, the mines developed a rich body of ore at 227 ft., and with the open ground came such a rush of water that sinking was stopped.

GOLD BUG MINING COMPANY.—This company is composed of St. Louis capitalists who bought the mine two months ago. They have a good steam jig plant and are producing 8 tons of zinc ore each shift. They have opened up a large face of zinc ore at 140 ft. in soft ground, with enough water to run the plant.

MEYERS & COOPER.—Their Cock Robin mine, on the Leonard land in Chetwood Hollow, is developing well. The ore is cleaned on a crusher and rolls and two hand jigs, and since May 9th, 1896, they have turned in 129,610 lbs. of zinc ore and 376,130 lbs. of lead ore. They have two drifts, running north and south at 95 ft. and at 125 ft., and have developed a large face of zinc ore in hard ground, with only enough water to clean the ore. They have 10 lots which have been prospected with a steam drill and ore found to 150 feet.

MIDWAY MINING COMPANY.—The company recently started the pumps and will soon work the steam concentrating plant. They have a large face

of zinc ore at 138 ft. in soft timbering ground and were making over two carloads of zinc ore each week when they shut down.

NEW JERSEY.
SUSSEX COUNTY.

NEW JERSEY ZINC AND IRON COMPANY VS. LEHIGH ZINC AND IRON COMPANY.—In the action in ejectment brought by the first-named company to oust the Lehigh Company from its possession of part of the great zinc-ore deposit at Mine Hill, near Franklin Furnace, the New Jersey Court of Errors and Appeals has affirmed the judgment of the lower court in favor of the defendant company. The Lehigh Company therefore retains possession of its share of the deposit. This decision closes a case which has been before the courts in different forms for many years. A more extended reference to the case will be found in another column.

NEW MEXICO.
GRANT COUNTY.

MINA GRANDE.—Bell & Stephens are working this mine with good results. The north shaft has attained a depth of 182 ft., and drifts have been started north and south. The south drift will connect with a level being driven from the south shaft, 544 ft. distant, which level has now advanced 180 ft., steps being carried with the drift and ore extracted as progress is made.

MOUNTAIN KEY.—W. C. Chandler is working this mine with good results. The mine has been opened to a depth of 700 ft. by the old Mountain Key Company, a St. Louis organization.

OHIO.

SANDSTONE QUARRY COMBINATION.—Cleveland despatches report that arrangements have been made to consolidate the companies operating the sandstone quarries in the Northern Ohio District. The companies that will become part of the new corporation are the Malone Stone Company, quarries at Euclid and Amherst; Cleveland Stone Company, quarries at Borsa and Amherst; Forest City Stone Company, quarries at Euclid and Columbia Center; Mussey Stone Company, quarries at Elyria and Amherst; Elyria Stone Company, quarries at Grafton; Grafton Stone Company, quarries at Grafton; Bailey Stone Company, quarries at Berlin Heights; Bryant Stone Company, quarries at Elyria, and Ohio Stone Company, quarries at Independence. A year ago these companies came together and made a price agreement. Previously they had for some time failed to make money, but after the agreement profits became larger. The agreement has been kept, and now it is thought best to solidify it by means of one corporation. The capital will be \$5,000,000, and the intention is to buy up all the small quarries not in the combination.

(From Our Special Correspondent.)

LABOR TROUBLES.—The operators and men in this State are hoping to arrive at some definite agreement in the near future. All miners and operators are anxiously looking forward to the national convention, which will be held in Columbus on the second Tuesday in January.

OREGON.
GRANT COUNTY.

BLACK BUTTE.—A new Merrill mill has just been erected at this mine at Fox.

VICTORY.—The Lane Brothers are running a new crosscut tunnel in this mine, at Susanville, and will build a new 10-stamp mill next spring.

PENNSYLVANIA.
ANTHRACITE COAL.

PHILADELPHIA & READING COAL AND IRON COMPANY.—The statement for October and the 11 months of the fiscal year from December 1st to October 31st is given below:

	October.	Eleven mos.
Gross earnings.....	\$2,767,852	\$21,153,043
Expenses.....	2,506,036	21,159,936
Net or deficit.....	N. \$261,816	D. \$4,893
Fixed charges.....	95,000	1,045,000
Surplus or deficit.....	S. \$166,816	D. \$1,051,893

The expenses for the 11 months included \$761,158 for colliery improvements.

All the Reading properties were turned over by the receivers to the new company on December 1st. From that date they are operated by the reorganized corporation. The terms of the reorganization have already been fully explained in our columns.

ROYAL OAK COLLIERY.—The new breaker for this colliery has been completed and operations will commence about January 1st.

SOUTH CAROLINA.
LANCASTER COUNTY.

BLACKMON.—This gold mine, near White Bluff, which is being operated by Messrs. Stratton, Blackmon & Estridge, is said to be yielding in paying quantities. It is reported that the ore in sight will keep the machinery employed for the next four years.

SOUTH DAKOTA.
LAWRENCE COUNTY.

UNION HILL MINING COMPANY.—Work has begun on the 100 stamp mill for this company, and it is to be running next summer. The company has leased the Florence mine, near Galena, and is opening it.

PENNINGTON COUNTY.

MONTZUMA.—A new 60-stamp mill will be built upon this property, at Rochford, as soon as the ma-

terial can be secured and brought to the ground. This property was purchased last spring by Bart Bissacca and S. J. Zerega, of Lead City, who have had 10 men at work ever since. There are seven claims in the group, and there is a vein of free milling ore 36 ft. wide, 4,500 ft. long, which has been penetrated for 135 ft.

VIRGINIA.
LOUISA COUNTY.

ARMINIUS MINING AND CHEMICAL COMPANY.—A great deal of outside work has been done at the mines this fall. A large reservoir has been completed which will store an abundant supply of water for the mines; extensive storage bins and a loading platform at the railroad station have been completed and several minor improvements made. Shipments of pyrites from the mines are now increasing.

WASHINGTON.
SPOKANE COUNTY.

GOLD ORE COMPANY.—This company, of Cripple Creek, Colo., is preparing to put in sampling works at Spokane. The works will probably cost \$20,000 to \$30,000, and the company will be prepared to sample ore in ton and carload lots.

STEVENS COUNTY.

DEER TRAIL.—A half interest in this mine, in Cedar Cañon, has been purchased by L. M. Davenport and I. W. Goss, of Spokane, for \$30,000 cash. It is a silver lead mine, the ore assaying from \$125 to \$330 in silver.

WEST VIRGINIA.
CABELL COUNTY.

CROZER COAL COMPANY.—This company recently received from the Baldwin-Westinghouse company a new 20-kw. dynamo, which is now being placed in position.

WISCONSIN.

IRON—GOGEBIC RANGE.

PENOEKE & GOGEBIC DEVELOPMENT COMPANY.—This company has put a force of 300 men at work in its Tilden mine, and will keep them at work through the winter, stocking the ore for spring shipment. About 1,000 tons a day can be mined with this force.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

TRAIL CREEK DISTRICT.

(From Our Special Correspondent.)

NEVADA.—Eight men are at work in this mine, adjoining the Jumbo. The interests of the late Miss Rugh, one of the original owners, are being continued by the present management.

OTTAWA.—This property has been acquired by a Toronto syndicate represented by Mr. A. E. Osler, of Toronto, Ont. A force of men under Mr. Frank Davey is pushing development work. The Ottawa is on Lookout Mountain.

RED MOUNTAIN RAILWAY.—Track laying on the Red Mountain branch of the Nelson & Fort Shepherd Railway has reached a point 4½ miles from Rossland. The work is being vigorously pushed. At one point on the line, opposite the O. K. mine, the workmen some weeks ago uncovered an orebody of considerable proportions and a company was promptly organized to develop the property. This, so far as known, is one of the richest strikes made in this way.

SAN FRANCISCO.—Development work on this claim, which adjoins the California, is about to begin. The new owners are Winnipeg parties. The line of the Red Mountain Railway cuts through a ledge on the claim, but so far has exposed no ore or mineral. The San Francisco was located two years ago by Martin Salmon and James Mahoney, who, some months ago, sold it to the present owners. The location is regarded as favorable, as it adjoins the California on one side and is close to the White Bear.

MEXICO.

(From an Occasional Correspondent.)

The growing interest taken in the gold and silver mines of the west coast of Mexico must soon attract the attention of mining investors all over the world, especially as this interest is the result of actual returns and profits made from some of the recently acquired mining properties in this country. There has always been an idea that Mexico could produce only silver. Unless the writer is much deceived Mexico will soon produce more gold than silver in value. There is a gold belt running from Sonora through Sinaloa down to Jalisco, which is hardly touched. This 200 and more miles of gold country is lying idle because of the ignorance, impecuniosity or apathy of the inhabitants, and foreigners until quite recently have either disbelieved or not cared to risk their money in opening up this gold belt. San Jose de Gracia during the last two years and Minas Prietas are turning out so remarkably well that at last considerable attention is directed to this coast. The following are the gold and silver exports by last steamer (November 4th) for San Francisco from this port of Mazatlan, viz., 29 bars silver, value \$39,440.13, and 4 bars and gold coin (Mexican), value \$49,694.37, besides 314 sacks of gold and silver ore, value unknown, but certainly worth over \$40,000.

DURANGO.

(From an Occasional Correspondent.)

In this State an English company has just bought

a new property at San Fernando; the price paid here is \$200,000 gold. This mine is only a prospect, but the lode is so far opened to a width of 80 ft., and no walls yet found. Contents gold and silver.

A London syndicate has an agent here now negotiating the purchase of the celebrated Copalquin gold and silver mines. The price asked is not yet known, but it will be well up in the millions, the owner not being at all anxious to sell. The ore in sight is not only very rich but in large quantities. It is rumored that the men backing this London syndicate are closely connected with the Transvaal and some of the largest financial houses of London. Further south, another gold property, known as Quelrada Honda, has just been bonded by Americans. This is one of the promising but hitherto apathetically worked Mexican mines, which may turn out well when actively and systematically worked by foreigners.

Two other parties are daily expected, one representing Belgian and another American capital, to take over other gold properties bonded by them some few months ago.

The reopening of the old gold district of Las Uvas by an Englishman, will also soon be more actively carried on, as some Americans are coming to erect reduction works there. The ore so far found yields from ½ oz. gold to 26 oz. gold, and \$3.50 silver per ton.

LOWER CALIFORNIA.

(From Our Special Correspondent.)

BORENO BROS. MINES.—These gold mines at San Francisco, 350 miles southeast of San Diego, Cal., on the Gulf coast, are reported to have been bonded by A. H. Lacy and A. R. Bryan and associates, of Los Angeles, for \$100,000. A mill is to be erected and development work commenced at once. The mines are said to be very rich, but have not been developed on account of their isolation and the cost of transporting supplies and machinery.

PIEDAD.—This gold mine, at Jacalitos, east of Euseñada, is reported to have been purchased by E. Wiltzie, of San Francisco, for \$75,000. This property was owned by G. H. Hayes, and is said to be one of the best in Lower California.

SINALOA.

(From An Occasional Correspondent.)

In this State the San Jose de Gracia gold mining district is continuing to produce increasing quantities of gold bullion. There are three companies working there—two English and one Mexican.

The first English company, the Anglo-Mexican, working the Jesus Maria and other mines, has proved a complete success, and the steady returns of gold bullion speak for themselves. The other English company is commencing to produce gold, and the Mexican company is running a 10-stamp mill and coining money.

Five years ago this San Jose de Gracia district was controlled by an Englishman who tried in vain to interest English capitalists. At that time \$100,000 was rather more than the amount required to buy the whole district with timber lands, water rights, etc. To-day it would be useless to offer \$5,000,000 for the same.

SONORA.

(From An Occasional Correspondent.)

The Minas Prietas district is turning out to be one of the big gold producers of the world. The recent purchase of property there by an English company for \$1,000,000 gold will probably prove a good investment, although the commission of \$250,000 paid promoters seems rather heavy. Another property has since been bought by an American for \$50,000. Almost the same day an Englishman offered \$100,000 for the same mine. It was refused.

The largest and most productive group of mines, which were bonded for \$3,000,000 in England, are now being negotiated for by American capitalists. Price is unknown.

NEW SOUTH WALES.

BROKEN HILL PROPRIETARY COMPANY.—For the four weeks ending November 12th, the report shows 29,485 tons of ore treated. The output of the refinery was 388 fine oz. gold, 651,827 fine oz. silver, 1,790 tons soft lead, 35 tons antimonial lead and 223 tons copper matte. The contents of the matte are estimated at 41 tons fine copper and 29,854 oz. silver. The company has declared a dividend of 1s. per share, payable December 16th, making a total of 9s. per share paid this year.

NOVA SCOTIA.

HALIFAX COUNTY.

(From Our Special Correspondent.)

LAHN LODGE.—This mine, at Caribou, which has been a steady producer for a number of years and which has for the past few months been in very low-grade ore, has recently encountered rich ore at a depth of 700 ft.

NEW EDGERTON COMPANY.—This company, of Fifteen Mile Stream, has about completed its 30-stamp mill, and has also put in a new 11-drill air compressor and a complete overground electric-light plant. The company has been encouraged to the above expenditures by the large profits made in the last two years with an inferior plant.

HANTS COUNTY.

(From Our Special Correspondent.)

GOLDEN LODGE MINING COMPANY.—This company, of South Uniacke, has just paid its twentieth consecutive monthly 5% dividend on the capital stock of \$30,000, besides putting to rest a considerable sum and equipping the mine with an efficient and

modern plant. They have also done a large amount of development work, giving a large valuation of "ore in sight." The 9-in. quartz vein is free milling and yields from \$100 to \$250 per ton of rock. The deepest level is 600 ft. and shows the richest ore, 403 ft. having been sunk before any pay ore was seen.

QUEENS COUNTY.

(From Our Special Correspondent.)

LIBBEY.—This mine, at North Brookfield, will soon have the \$80,000 crushing, concentrating and chlorinating plant completed. The mine is now about 350 ft. deep on a 15-in. fissure vein, and has produced an average of \$8,000 per month for two years, working only a few men, and with an inferior 10-stamp mill.

SPAIN.

RIO TINTO COMPANY.—At a special meeting held recently in London the stockholders voted to divide each of the present shares of £10 par value into two shares of £5 each. One of these shares will be preference stock carrying a fixed rate of interest, to be determined hereafter; the other will be ordinary stock entitled to share in any surplus remaining after paying the preferred dividend. Last year the company paid dividends at the rate of 18% on the stock. The resolution will not become effective until another stock vote has been taken at the next general meeting.

TASMANIA.

MT. LYELL MINING COMPANY.—The board has decided to proceed immediately with the extension of the present reduction plant by the erection of two additional ore furnaces, giving plant capacity of 500 tons of ore per day. In addition to the above, a matte concentration furnace will be erected capable of treating the whole of the first matte produced by the four ore furnaces, as the latter will be constantly running on ore. Further additions will be considered at a future date, so as to bring up the plant to a daily capacity of 1,000 tons of ore, as originally contemplated.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 4.

Statement of shipments of anthracite coal (approximate) in tons of 2,240 lbs., for the week ending November 28th, 1896, compared with the corresponding period last year:

	1896.		1895.
	Week.	Year.	Year.
Pennsylvania Railroad.....	79,552	3,398,945	3,483,796

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending November 28th, and for years from January 1st, 1896 and 1895:

	1896.		1895.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	41,122	3,509,075	2,653,956
Barclay, Pa.....	1,553	42,682	136,406
Beech Creek, Pa.....	72,289	2,776,224	2,690,396
Broad Top, Pa.....	7,743	315,630	338,415
Clearfield, Pa.....	65,398	4,002,696	4,696,265
Cumberland, Md.....	75,848	3,232,621	12,742,900
Kanawha, W. Va.....	13,316,424	2,751,709	2,751,709
Phila. & Erie.....	1,988	75,457	46,950
Pocahontas Flat Top.....		2,653,904	12,260,245
Totals.....	265,971	19,954,713	18,267,272

* For year ending October 3d.
† For year ending November 14th.
‡ For year ending December 7th, 1895.

	1896.		1895.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	18,534	1,135,303	704,608
Pittsburg, Pa.....	33,619	1,710,577	1,514,551
Westmoreland, Pa.....	37,277	1,735,717	1,570,177
Totals.....	89,430	4,581,597	3,789,536
Grand totals.....	355,401	24,536,310	22,056,811

Production of coke on line of Pennsylvania Railroad for the week ending November 28th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 66,985 tons; year, 3,524,830; to corresponding date in 1895, 5,420,788 tons.

Anthracite.

A general improvement in business is noted in the anthracite market this week, though it seems to be felt more by some producers than by others. The long-looked-for cold weather has arrived, and with it has come a greater demand for coal, but unless the low temperature continues for some time the improvement in trade will amount to very little. During the warm weather of 10 days ago, and the accompanying drop in trade, report was current that December would see an output of but 2,500,000 tons. This week, with conditions more favorable to the producer, these figures have already risen to 3,000,000 tons, at which rate there is no telling what the actual result will be at the end of the month. From one source we hear that a general understanding is to be reached shortly to maintain the September schedule of prices firmly. From all sides, however, we hear that these prices have been continually shaded, admittedly as much as 25c. per ton on stove coal, and on the other sizes in proportion. Perhaps even lower figures have been accepted from "old customers." Presumably the September schedule of prices was made to rule as the trade quotations, yet, after three months of trial, during which reasons for failing to maintain them were no better than can be advanced now for holding them firm, the real effort to make them rule is to be made. Judging from this bit of history it does not seem likely that the effort will be a success, if made. An exceptionally

poor market during the year, and the total consumption several million tons below last year's figures seem to have been the cause of the cutting of prices to catch trade, and this competition had to be met by all. After the experience of the year 1895 it seems that the anthracite coal interests should know full well that "a house divided against itself cannot stand," and that a house built upon culm has no more stability than one "founded upon the sands."

NOTES OF THE WEEK.

The Schuylkill Coal Exchange gives notice that the Philadelphia & Reading collieries drawn to return prices for coal sold in November, 1896, to determine the rate of wages to be paid, show an average price of \$2.75, and the rate of wages to be paid for the last two weeks of November and the first two weeks of December, 1896, is 8% above the \$2.50 basis.

Bituminous.

The Atlantic seaboard soft coal trade seems to be steady, although general complaint is heard because of the small amount of business being done. It is mostly a hand-to-mouth business, with very few large contracts to ship on for a basis. It is hoped that the present cold weather will last long enough to brighten the market to some extent.

The chief demand for coal comes from the Sound ports, to which the tonnage has been increased to a slight extent by the falling off of ocean freight rates to their territory. Business around Cape Cod is slack, and there is little or no demand at this writing, the market being very little changed from last week. The New York Harbor market is in its usual quiet state.

In all-rail trade there is some talk of cutting, although the prices being made at the mines on this class of trade do not permit of much reduction.

Transportation from mines to tide is much better now than it was, even in the fore part of the week, and shipments are moving quickly. Car supply is up to all demands.

The coastwise vessel market shows little change, the supply being about up to the demand. Freights also show very little change, the cold snap not even influencing them to any extent.

It will be noticed that the following list of ports to which freight rates are quoted lacks the names of a number that have appeared each week. This is due to the fact that shoal water ports and ports far north are partially or entirely closed by ice, and vessel captains do not care to go to them on that account.

We quote current rates of freight from Philadelphia as follows: To Boston and Salem, 70@75c.; Providence, New Bedford and other Sound ports, 60@65c.; Portland, Portsmouth and Wareham, 75c.; Lynn, 80c.@\$1; Newburyport, 80@85c. Five and 10 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.

The Pacific Company is the title of a corporation which has just obtained a charter from the State of Vermont. The authorized capital stock is \$20,000,000, and the officers and directors are as follows: President, Harry Keene; secretary, R. W. Hawkesworth; treasurer, Jacob Bertschmann. The directors are the three above named and Charles F. Dieterich, Charles Coudert, E. J. Jerzmanowski, Isaac Alzamora, John C. Barron, David S. Walton, Henry T. Scott, Jose M. Yrigoyen, Charles W. Mayer and Appleton D. Palmer. The company's New York offices are at No. 100 Broadway. The general object of the company is to carry on business with Peru and other South American countries, and its present special object is said to be to develop coal mines in Peru and to carry coal from those mines to San Francisco and other points on the Pacific coast.

Buffalo.

Dec. 3.

(From Our Special Correspondent.)
Anthracite coal is moderately active; the weather experienced for several days was just the kind to deplete stocks in cellars. No change in quotations nor any expected. Consumers consider, of course, that prices are too steep in view of the competition of natural gas, electricity and cheap soft coal. Severe weather prevailed, in the upper lake regions especially, for several days, hindering navigation, as vessels sought ports for safety under advice of the Weather Bureau. Few disasters are reported in consequence. Bituminous coal is plenty and sales made at low figures. Steamboating is practically over for the season, hence there is little demand for fuel for vessels, and the surplus on hand is thrown on to the market for manufacturing purposes.

Coke is in fair demand. News from the ovens is to the effect that business is steadily improving. The shipments of coal westward by lake this season to December 1st aggregated 2,320,668 net tons; in 1895, 2,496,033 net tons; in 1894, 2,283,405 net tons. This shows a decrease under last year of 175,365 net tons, and under 1894 of 65,737 net tons.

The shipments of coal westward by lake from Buffalo from November 22d to 28th, both days inclusive, aggregated 88,257 net tons, distributed as follows: 46,157 tons to Chicago, 23,900 tons to Mil-

waukee, 4,000 tons to Duluth, 900 tons to Toledo, 3,400 tons to Gladstone, 6,000 tons to Superior, 2,300 tons to Manitowoc; and 1,600 tons to Ashland. The rates of freight were 60c. to Chicago, Milwaukee and Manitowoc; 50c. to Duluth, Ashland, Gladstone and Superior, and 30c. to Toledo and Windsor. Closing dull as season for shipping is about over.

Mr. Thomas Hodgson, for 20 years the head coal agent of the Pennsylvania Coal Company in this city, died in New York last Saturday, and was buried in our Forest Lawn Cemetery on Monday. He was transferred from Buffalo to New York early this year. He was a man much honored and esteemed by all who knew him. Resolutions were passed by the coal merchants, the Merchants' Exchange and the Freemasons.

After a good season's business the canals of the State closed last Wednesday noon. The work of improvement and enlargement have already been commenced.

Mr. Andrew Carnegie, the iron manufacturer, has let a contract for the erection of a very large ore-receiving and coal-loading plant at Conneaut, O., which is the northern terminus of his railroad, the Pittsburg, Shenango & Lake Erie. Mr. Rockefeller will deliver ore from his Lake Superior mines at the Conneaut docks.

Many of the vessels arriving at this port this week were coated with ice, showing that they had experienced cold and stormy weather on their way down. Some chartering was done for Lake Michigan ports with the understanding that the coal cargoes should be held on board vessels at destination until owners wanted to use it. This week will see the close of the season's business of 1896.

Chicago.

Dec. 2.

(From Our Special Correspondent.)

Anthracite.—We have had a week of cold weather, and consequently more anthracite coal has been sold in this market than in any of the preceding weeks of November. A considerable quantity has been shipped to out of town points, particularly the Northwest, where blizzards have augmented the demand. In the city jobbers have had more to do from the fact that dealers have made their first real move of the present winter to stock up, and consequently the tonnage placed during the week has been of fair proportions. There is a good supply of anthracite coal in the city as the docks and the yards of railroad companies show, but their is no likelihood that there will be any to much, for when real cold weather strikes town, it will drive people to buying. The circular rates that have attracted so much attention of late from their seemingly exorbitant prices on hard coal, are not holding and to secure trade reductions are universal. The circular prices are Grate \$5.60; egg, stove and chestnut \$5.80, f. o. b. cars Chicago. The retail trade appears to be asking and receiving \$6.75 per ton.

Bituminous.—Demand for soft coal has increased during the past few weeks owing to the increase in manufacturing lines. There has been a good deal of coal sold during the week. There is a large inquiry for delivery after the first of the new year and indications are for a great trade then.

Pittsburg.

Dec. 3.

(From Our Special Correspondent.)

Coal.—The wage mining scale for 1897 is one of the burning questions in the bituminous fields of Ohio and Pennsylvania, especially among the lake shippers. The voluntary reduction of wages made by miners completely upset the Ohio situation, which had been carefully nursed by the operators. The Ohio mining rate, it is claimed by miners, is a starving rate and one that the coal diggers cannot work for and live, while the Pennsylvania price is not much better; it is therefore proposed to raise the rate 6c. throughout the two districts.

The report has gained circulation that the operators are about to form a pool. The Tide Coal Company in the fourth pool is paying advanced wages. Another one in the Ohio enabled shippers to forward about 5,275,000 bu. coal, notwithstanding the fact that the lower markets are abundantly supplied. The railroad districts have undergone no change since our last: mines are running actively and shipments large. Report says there are about 6,000 river miners on a strike; the miners say 6c. or nothing.

Connellsville Coke.—The whole coke region has undergone a change for the better, and ovens are now burning which have been cold and deserted for months. The resumption shows gratifying figures. There are now 8,215 active ovens in the region, a large gain over the preceding week. Two days last week showed more genuine activity in the coke region than has been witnessed for months. The week's summary of the region shows 3,215 ovens in blast, with 9,917 idle. There were 305 ovens fired that helped to increase production; besides, there were 783 ovens fired up in two days. The Frick Coke Company is credited with firing a total of 783 ovens. The outlook is bright for still further increase to the active list in the near future.

In the running order of the ovens in blast, 268 ovens made six days; 4,891 ovens made five days; 1,628 ovens four days, and 25 ovens seven days. The week's shipment of coke from the region amounted to 4,413 cars; preceding week, 3,321 cars, being an increase of 492 cars. Shipments from the region: To Pittsburg and river points, 1,862 cars; to points west of Pittsburg, 2,125 cars; to points East, 430 cars; total, 4,413.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Dec. 4, 1896.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From	
	Dec. 6, 1895.	Dec. 4, 1896.	Jan., '95.	Jan., '96.
	F'ces.	Tons.	F'ces.	Tons.
Anthracite.	58	36,350	27	15,950
Coke.....	156	180,160	85	116,200
Charcoal...	24	5,090	21	5,200
Totals	238	221,600	133	127,250
				8,613,347
				8,213,729

The spurt of activity in the iron market is over and business has settled down into a quiet condition, with the prospect that it will continue in that state until the spring trade begins. How good that will be depends upon a good many conditions, some of which are still too unsettled to warrant any predictions.

The furnacemen just now are most concerned about ore and coke prices for next year. The Lake ore producers have given no indications yet of their intentions, and seem to be taking matters very quietly. The Connellsville coke makers are now pretty well consolidated, the Frick Company having made arrangements with most of the other producers. They are in a condition to regulate prices to suit themselves. While the rates for next year have not been fixed, there is a very general impression that there will be no reduction.

Pools and combinations continue to be the chief talk of the trade. Of the lesser ones the beam pool seems to be broken up for the time, and there is some doubt as to whether it can be reconstituted. An effort is being made to settle differences about the allotment of work, but with rather dubious prospects of success.

The steel-billet pool seems to be having lots of trouble, and charges of evasion of the agreement and sales under unfair conditions are openly made. Further trouble is promised because, it is said, the open-hearth men are pressing sales of finished material at prices which seriously affect the business of the mills working on Bessemer material. In the late reorganization of the pool it was extended to cover finished products turned out by the mills making their own Bessemer steel, but in open-hearth only billets were included.

At the meeting held in New York on December 1st, the Nail Association first adopted a new nail card and then voted to close up its affairs and go out of existence. The new card, which is free from most of the objectionable points of the old one, and its voluntary decrease are about the only good things which can be recorded of this pool. No section of the iron trade comes so closely in contact with the retail trade and the public as the nail manufacturers, and the managers of this pool apparently took pains during its period of existence to make it as objectionable and oppressive as such a trust could possibly be. By high prices, boycotting and a general system of high-handed suppression of competition the pool made itself altogether odious. Its inside history and an account of the money it expended in buying off outsiders would be interesting reading, but will probably never be made public.

Orders for pig iron for export continue to come to the Alabama furnaces. They are generally small, but a regular trade of some importance seems to be growing up.

New York. Dec. 4.

The local market has settled down and is now about as quiet as it usually is in December. Sales continue on a moderate scale and there is a fair supply of small orders from the shops. There is talk of extensive building operations to be begun in the spring, but none of these has as yet come on the market for material. Nothing new can be reported in other lines.

Pig Iron.—Sales have been moderate and agents' time has been taken up chiefly in discussing contracts for 1897 delivery. As a rule they are in no special hurry to close these, hoping that something may develop to warrant better prices. For the present there is no change, but there is also no cutting.

For Northern iron we quote: No. 1 foundry, \$12.50 @ \$13; No. 2 foundry, \$11.75 @ \$12.25; 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, and orders for Spring delivery do not seem to be ready 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 \$28 @ \$29, with few sales. No business is reported. Buyers are holding back for pool developments.

Merchant Iron and Steel.—Business is quiet with chiefly small sales. Prices show no change. For bars we quote: Common, 1" @ 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 fair in a small way, and, without quotable changes, prices are 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.—No new contracts are noted. There is no nominal change in prices, but some cutting on beams is reported. We quote for angles, 1"25 @ 1"35c.; channels, 1"70 @ 1"75c.; tees, 1"65 @ 1"70c.; beams, 1"70 @ 1"75c. for large orders, and 1"80 @ 1"90c. for small lots.

Steel Rails and Rail Fastenings.—The combination price is still \$23.75 per ton at tidewater or \$28 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 fairly well. Discounts are as follows for plain pipe, out of store: 1 1/2 in. and over, 67, 10, 10, 10 and 5%; 1 1/4 in. and under, 57, 10, 10, 10 and 5%. Galvanized pipe, 1 1/2 in. and over, 55, 10, 10, 10 and 5%; 1 1/4 in. and under, 52, 10, 10, 10 and 5%. Boiler tubes, 1 in. to 2 1/4 in., 70, 10 and 5%; 2 1/2 in. up, 70 and 5%. Cold-drawn seamless steel tubes, 60%.

Nails.—The dissolution of the pool is referred to above. It is almost impossible to fix prices just yet. There has been talk of selling at 85c. at mill, but no one can fix such a sale. The nearest quotations that can be given are \$1.35 @ \$1.75 at mill for wire nails, and \$1.25 @ \$1.60 for cut nails. It will take a week or two to steady the market. Buying is large.

Old Rails.—Old iron rails are quoted \$12.50 @ \$13.50, New York. Old steel rails are quoted \$10.50 @ \$11.50; \$12 is asked for good lots. 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 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.

Chicago. Dec. 2.

(From Our Special Correspondent.)

Pig Iron.—The prevailing conditions in the pig-iron market show the usual dullness that characterizes this season of each year. The sales during the week have not footed up a great deal, and those made were chiefly for carload up to 100-ton lots. The market is very firm, however, prices continuing to hold their own with some tendency toward an advance. The firmness noticed here is due chiefly to the large inquiry for iron after the first of next year. The trade of the week has been about equally divided between the Northern and Southern furnaces. 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 @ \$14.25; Alabama car wheel, \$16.25 @ \$16.75; coke, Bessemer, \$13 @ \$13.50.

Bar Iron.—Large business is scarce, though there is some inquiry that ought to result in business soon. The trade of the week has been of fair proportions made up of small lots. Bar quotations are: Common iron, 1"15 @ 1"20c.; guaranteed, 1"20 @ 1"30c.

Steel Rails.—The demand continues for rails in small quantities, no contracts of any large size having been closed during the week. Rails are quoted \$23 per ton, Chicago.

Billets and Rods.—Billets are in poor demand, but rods have increased in sales through the dissolution of the nail trust. Billets are quoted \$21.25; rods, \$27.50 per ton, Chicago.

Structural Material.—Business has quieted down somewhat, only a few small contracts having been closed during the week. Bridge material continues in most active demand. Quotations are: Beams and channels, 1"70c.; angles, 1"30 @ 1"35c.; tees, 1"50c.; plates, 1"30c.

Old Rails and Wheels.—A good-sized sale of old iron rails is noted with a few small sales of old wheels. Old iron rails are quoted \$14 @ \$14.50; old wheels, \$13 @ \$13.50.

Cleveland. Dec. 2.

(From Our Special Correspondent.)

Iron Ore.—Ore purchasers have been making up for lost time since the election, and the result is that the volume of business done last week exceeds that of the corresponding week last year. The business has not been heavy in the sense that word was used several years ago, but the dealers report that it has been fairly good during the past ten days. No

large sales have been made, but numerous small ones are reported.

It is probable that the scale of prices will be changed considerably next spring. Already rumors are afloat to that effect. A meeting of the Western Ore Association was held in this city Tuesday afternoon, and several members of the organization said they were dissatisfied with the general condition of the market and would make an effort to better it in the spring. Meanwhile the nominal quotations remain the same. They are: 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.

What will probably be the last ore cargo brought down the lakes this season will be carried by a steamer which left for Marquette yesterday.

Pig Iron.—Foundry and charcoal irons were the only active commodities on the pig-iron market this week. The trade in them has been only moderate. Not much has been done in Bessemers. The quotations remain unchanged this week: Lake Superior charcoal, \$13.50; Bessemer, \$12.75 @ \$13; 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.

Philadelphia. Dec. 4.

(From our Special Correspondent.)

Pig Iron.—Despite an increased consumption of iron and a strong tone to the market sales of iron have been for small lots and to customers whose purchases do not make much impression on the market. In fact, there is a feeling of depression all around in spite of the knowledge that a great deal of business is close at hand; well posted dealers and brokers do not explain the situation the same way. Prices are said to be weaker already, but close inquiry only uncovers a willingness among certain concerns to make more inviting terms in case a large buyer were to make an offer for delivery within 60 days. The notion still prevails that when the good times do come, prices will be higher. We are waiting for interesting developments in other branches of the iron trade. No. 1 Foundry is \$13; No. 2, \$12.50; standard forge, \$11.50; ordinary, \$10.50 @ \$11 with variations to suit circumstances; Bessemer, \$14; Basic, \$11.75; low phosphorus, \$17.

Steel Billets.—There are rumors of more trouble, and this, if nothing else were needed, would scare off possible buyers. Some developments are looked for in a very few days. Sales have been made at \$21.50, though \$21 has also been taken for what brokers call outside lots.

Merchant Bars.—The only talk is that we are on the eve of big business, but for prompt deliveries prices are a little less than a week ago. Very little business is coming in and there is no sign of full employment at mills. Refined is 1"15 in large lots, but 1"25 in small lots.

Skelp.—There is very little of interest to report. Great expectations are indulged in.

Sheets.—The sheet mills have been favored with two or three good orders this week, but business does not come along as fast as firm prices call for. Card, 1"70 @ 2"70.

Merchant Steel.—Our merchant-steel business never assumes very large dimensions, and just now buyers are waiting until their customers present their orders. Prices, therefore, are rather weak.

Pipes and Tubes.—Small pipe contracts this week indicate that more business is near by. The policy of users of wrought pipe in a large way is to not begin to press work until the general trade and manufacturing conditions are better.

Plate and Tank.—Plate-steel makers admit the demand was a spurt, and that it now appears to be over for a while. On the other hand, they have found a great deal of work laid out on paper and in engineers' specifications, which must, sooner or later, bring joy to the heart of the manufacturer. Tank is 1"30; universals, 1"35; shell, 1"40; flange, 1"50; firebox, 1"60.

Structural Material.—There is a disposition to shade prices. Certain parties who will need considerable material have been advised to hop in and buy now while the combination is asleep, lest it wake up and put up prices. The only thing indicative of much business has been the receipt of several rather favorable inquiries, but brokers express the opinion that the present opportunity will be permitted to pass. The manufacturers themselves have not yet seriously cut prices. Small-sized beams are quoted at 1"50.

Steel Rails.—Regarding steel rails there is a general expectation that the mill combination will soon declare prices for 1897. There is a very strong hope that prices will be marked down, but as the combination knows how to hold together they may not yield. If so, our people here say there will be very moderate ordering.

Old Rails.—Old iron rails are offered at \$14.50, but there is not much business.

Scrap.—The dullness in other branches of the iron trade has induced holders of salable scrap to attempt no advance for the present. Choice railroad sold at \$13.50 this week. Iron axles might bring \$17; old steel rails, \$13; heavy steel scrap, \$13; machinery cast, \$10.

Pittsburg.

Dec. 3.

(From Our Special Correspondent.)

Raw Iron and Steel.—Business developments since our last have not been unfavorable, although some disappointment has been felt in certain quarters because the demand for raw iron has not been larger. It makes no difference how much business is done; there are always some who think there ought to have been more. A continued tendency to industrial recovery and a widespread feeling of confidence in the prospects of more active business operations after the holiday season are the hopeful features of the situation.

The iron and steel trades have developed no noteworthy increase in activity; but the season is not propitious for the placing of large orders and no surprise should be felt if the markets should continue quiet for a time. The rupture in the nail pool, and the consequent drop of \$1 or more per keg in nail prices, has been quite a feature of the week, and the trouble in this combine is regarded as the presage of a return to normal prices and an early enlargement of demand for consumption. The existence of other combinations and demands for prices, which consumers do not believe can be maintained, tend to unsettle confidence and retard improvement in other branches of the iron industry. Business in the past week has increased somewhat, but is still not what was hoped for, but raw materials are firm; the output is not excessive, and with the expansion in the volume of business higher prices are certain to come. There is considerable negotiation going on for pig iron deliverable next year, but producers generally hold firm as to price.

Scrap iron is very firm, with limited stocks in first hands; holders generally refuse to accept prices offered, demanding more money—the same remarks govern old iron and steel rails. Finished material is increasing steadily, with many orders coming in for limited amounts. The demand for wrought iron pipe is active; one of the city plants is turning out 100 tons a day, and is shipped as fast as made.

Latest.—Market is weaker for certain descriptions, and buyers generally are offering lower prices. Mill iron is firm and in moderate demand. Bessemer pig is weak, with sales at \$12@12.25 Pittsburg; Valley sales, \$11.25@11.30. Steel Billet sales are principally at steel prices, middlemen quote 50@75c. less.

COKE, SMELTED, LAKE AND

NATIVE ORE.

Tons. Bessemer, Jan., Feb., Pitts. \$12.30

3,000 Gray Forge, Dec., Jan., Pitts. 10.75

3,000 Gray Forge, Dec., Jan., Feb., Pitts. 10.80

2,900 Bessemer, Dec., Pitts. 12.15

1,200 Bessemer, Dec., Pitts. 12.25

1,000 Bessemer, Dec., Pitts. 10.50

1,000 Bessemer, Dec., Pitts. 12.25

1,000 Gray Forge, Dec., Valley. 10.00

1,000 Bessemer, Jan., Feb., Pitts. 11.40

650 Bessemer, Dec., Valley. 11.25

500 Gray Forge, spot, Pitts. 10.25

500 Gray Forge, Dec., Pitts. 10.35

500 Bessemer, Dec., Pitts. 12.10

300 No. 2 Foundry, spot, Pitts. 11.25

200 No. 1 Foundry, prompt, Pitts. 12.25

100 No. 2 Foundry, spot, Pitts. 11.60

100 No. 2 Foundry, spot, Pitts. 11.50

100 No. 2 Foundry, spot, Pitts. 11.55

CHARCOAL.

50 No. 2 Foundry, Pitts. \$16.00

50 Cold Blast, Pitts. 23.25

50 Warm Blast, Pitts. 17.50

25 No. 2 Foundry, Pitts. 16.00

BLOOMS, BILLETS AND SLABS

AT MILL.

2,700 Billets, Dec., at mill. \$20.25

500 Billets, Dec., at mill. 20.00

500 Billets, Dec., at mill. 19.75

300 Billets, prompt, at mill. 19.50

150 Billets, spot, at mill. 20.00

BLOOMS, BILLETS AND BAR ENDS.

500 Billet ends, delivered, Pitts. \$13.00

500 Bar ends, delivered, Pitts. 13.00

MUCK BAR.

600 Neutral, delivered, Pitts. \$ 0.00

STEEL WIRE RODS.

750 5-gage, Dec., Pitts. \$14.50

500 5-gage, delivered, Pitts. \$14.00

SKELP IRON.

300 Sheared, Pitts. \$140 4 m.

250 Wide grooved, Pitts. 1.25 4 m.

200 Narrow grooved, Pitts. 1.25 4 m.

SKELP STEEL.

700 Narrow grooved, Pitts. \$110 4 m.

650 Wide grooved, Pitts. 1.10 4 m.

450 Sheared, Pitts. 1.30 4 m.

SHIRT BARS.

1,000 Delivered, Pitts. \$22.25

OLD RAILS AND SCRAP.

250 Iron Rails, Pitts. 16.00

100 No. 1 Wro't, net, Pitts. \$12.00

100 Wro't Turnings, net, Pitts. 7.00

100 Cast Borings, gross, Pitts. 7.00

100 Iron axles, net, Pitts. 17.00

METAL MARKET.

NEW YORK, Friday Evening, December 4th, 1896.

Gold and Silver.

Prices of Silver per Ounce Troy.

Table with columns for Nov & Dec, St. Ex., London Pence, N. Y. Cts., Value of sil. in \$, and December, St. Ex., London Pence, N. Y. Cts., Value of sil. in \$.

Silver has been very steady. London absorbs what is offered at 29 1/2 d., but refuses to bid higher, consequently smelters, unable to find a better mar-

ket and unwilling to hold on, have been accepting this figure. Openings continue quite free.

The United States Assay Office in New York reports the total receipts of silver at 101,000 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 for Month, 1896, 1895, 1894, and sub-columns for London and New York in Pence and Cents.

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 for Coin and bullion, In ores, Total excess, Exp. or Imp., and rows for Gold and Silver for Oct, 1896, 1895, 1894, and 1893.

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 4th, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

Table with columns for Gold, Silver, Total Excess, Exp. or Imp., and rows for Exports and Imports for the week and years 1896-1892.

Of the gold exported for the week, \$15,000 went to Central America, and the balance to the West Indies; of the silver \$3,110 went to the West Indies, and the remainder to London. The gold and silver imported came from Europe, and Central and South America.

FINANCIAL NOTES OF THE WEEK.

The general condition of business is rather quiet, and little that is new can be reported for the week. In some quarters disappointment is expressed at the comparatively slow revival of trade, but this was only to be expected. The tension which existed before the election was not removed until after the usual period of the Fall trade activity had passed. Recovery from a long period of depression is necessarily slow at any time. Above all there is the apprehension that Congress at the coming session may take some action which may disturb the course of business.

Money from the outside banks continues to come to New York in amounts much greater than those which are drawn away from the city banks. This was to be expected, and the tendency will probably continue for some time. Gold imports are suspended, and the rate of sterling exchange indicates that they will not be resumed at present. It looks as if heavy grain exports will be balanced by large purchases of goods abroad, and the disposition to buy American securities has been checked by the current high rates for money in London, Paris and Berlin.

In pursuance of a call issued by the Indianapolis Chamber of Commerce, a number of delegates from Western cities met in Indianapolis on December 1st to consider the advisability of issuing a more extended call for a larger convention of the commercial bodies of the principal cities to discuss the question of what ought to be done to cure the radical defects in our monetary system, and if

deemed practicable and for the best interests of all to create a non-partisan commission, composed of able, experienced and fair-minded business men, whose duty shall be to formulate a plan which will remove existing weak spots in our present cumbersome and defective system, place the finances of the nation on a sound and adequate basis and prevent the possibility of frequent monetary disturbances.

A number of well-known men were present and joined in the proceedings. It was decided to call a general conference, to which all commercial bodies in the United States will be invited to send delegates. The place for this conference was fixed at Indianapolis, and the date as January 12th, 1897. The formal call will be issued shortly.

The receipts of the United States Treasury for November amounted to \$25,210,693 and the disbursements to \$33,360,720, showing a deficit of \$8,050,024. For the five months of the fiscal year from July 1st to November 30th the statement is as follows:

Table with columns for 1895, 1896, and rows for Customs, Internal Revenue, Miscellaneous, Total receipts, and Disbursements.

The receipts showed this year a decrease of \$9,628,627, and the payments an increase of \$14,448,892, the result being an increase of \$24,077,519 in the deficit.

The statement of the United States Treasury on Thursday, December 3d, 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 Nov. 25, Dec. 3, Changes, and rows for Gold, Silver, Legal tenders, Treasury notes, and Totals.

Treasury deposits with national banks amounted to \$16,004,443, showing a decrease of \$618,839 during the week.

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$121,436,280. Against these are held in the Treasury 10,227,890 coined standard silver dollars, and silver bullion purchased at a cost of \$11,208,330, making a total of \$121,436,280.

The statement of the New York banks—including the CB banks represented in the Clearing House—for the week ending November 28th, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

Table with columns for 1891, 1895, 1896, and rows for Loans and discounts, Deposits, Circulation, Reserve, Specie, Legal tenders, Total reserve, Legal requirement, and Surplus reserve.

Changes for the week this year were increases of \$8,856,200 in loans and discounts; \$14,339,000 in deposits; \$437,600 in specie; \$5,253,200 in legal tenders, and \$2,106,050 in surplus reserve; a decrease of \$113,900 in circulation.

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

Table with columns for Gold, Silver, Total, and rows for Asso. Banks of New York, Bank of England, Bank of France, Imp. Bank of Germany, Austro-Hungarian Bank, Netherlands Bank, Belgian National Bank, Bank of Spain, Bank of Italy, and Imp. Bank of Russia.

The return for the Associated Banks of New York is of date November 28th; all the others are of December 3d, except the Bank of Italy, October 31st, and the Bank of Russia, October 16th-28th. 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 Im-

Philadelphia.††	Imports.	
	Week. Nov. 11.	Year, 1896.
Antimony, casks.....		102
Copper ore, long tons.....		18,710
Ferro-manganese, long tons.....		897
Ferro-silicon.....		535
Iron ore, long tons.....	6 250	234,582
" pig " " ".....		650
" pyrites, long tons.....	2,740	5,798
" and steel scrap, long tons.....		618
Manganese ore, long tons.....		12,914
Spiegeleisen " " ".....		134
Tin " " " ".....		476
Tin and black plates, boxes.....		49,166

†† From New York Metal Exchange Reports.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Dec 4.

Heavy Chemicals.—In this market more business is reported during the past week in alkali and caustic soda. More inquiries have been received for caustic soda and more contracts made for delivery, so that the market in this commodity has been much stronger. Bleaching powder has been scarce and the market continues strong, though no change in prices has occurred. Contracts for 1897 delivery are still being made.

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@76%, \$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.—Business in acids at this time is reported quite fair, though the season is at hand when inventories are usually taken and trade affected in consequence. Annual contracts are now being made, which constitutes a fair share of the business doing. The situation in oil of vitriol is quite strong, owing to the firmness of the brimstone market. Prices remain unchanged, and are as follows, in New York and vicinity: 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.—There is very little of this commodity in hand for spot delivery, and the demand for it is only fair. Quite recently as much as \$25.50 was paid for large lots for spot delivery, but the average spot quotation for best unmixed seconds is \$21 per ton. Arrivals by January steamer are quoted at \$21½, which is said to be a minimum figure. For thirds the quotation is 75c. per ton less. The market seems rather unsteady because of the uncertainty as to the prices that may obtain at any time. With ocean freight rates at 16s. per ton, there seems little likelihood, however, that heavy shipments to this country will be made. There is a probability that a domestic supply will soon be furnished, as noted below.

Fertilizing Chemicals.—Not much has been doing in this market during the past week, so that trade is now reported as dull. Reports of the receipt of cattle and hogs through the West show them to have been less than during the same time for the last 20 years. Prices have changed on some substances, most of them having tended downward. They have been entered in the following quotations:

Sulphate of ammonia, gas liquor, \$2.20 for shipment, and \$2.12½@ \$2.15 on spot; bone, \$2.05 per 100 lbs. Dried blood, high grade, Western, \$1.85 per unit New York; f. o. b. Chicago, \$1.55@ \$1.60 per unit; low grade, fine ground, Western, \$1.60@ \$1.65 f. o. b. Chicago. Azotine, \$1.80 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, \$20.75@ \$21; low grade, \$14. 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@ 36% 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.—Early in the week this article

ruled steady on the spot at about 7½c. for good sized lots, but forward shipments were quoted irregularly, although considerable business had been transacted recently. During the latter part of this week 7½c. was asked, but this price can be shaded to 7c.

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.—The demand at this time is said to be rather light, though prices are quite firm. For spot we quote 1.90@ 1.92½c.; for shipment in the near future, 1.87½c., and for January and February, 1.85c.

Messrs. Mortimer & Wisner, the well-known brokers of this city, send us the following statement of nitrate of soda, issued under date of December 1st:

	1896.	1895.	1894.
	Bags.	Bags.	Bags.
Imported into Atlantic ports from West Coast S. A., from Jan. 1, 1896, to date.....	807,588	728,147	594,060
From Europe.....		4,300	
Total.....	807,588	732,447	594,060
Stock in store and afloat Dec. 1, 1896, in New York.....	123,528	31,353	56,614
Boston.....	17,685	1,900	1,300
Philadelphia.....		16,543	
Baltimore.....	600	6,500	4,000
To arrive, actually sailed.....	180,000	258,000	268,000
Via supply to Mar. 15, 1897.....	326,813	314,298	329,364
Stock on hand, Jan. 1, 1896.....	53,839	58,367	44,938
Deliveries past month.....	62,911	79,849	66,700
" since Jan. 1 to date.....	714,614	734,516	577,634
Total yearly deliveries.....		828,042	701,262
Prices cur. Dec. 1, 1896....	1.87½	1.80	2.10

NOTES OF THE WEEK.

The United States Sulphur and Chemical Company, owning the deposits of sulphur in Texas which were referred to some time ago in the *Engineering and Mining Journal* (July, 1896), is offering an issue of bonds for the purpose of immediately developing its mines. The issue is of \$100,000, bearing 6% interest; the bonds are payable in 10 years at 110 and redeemable at any time before expiration, at the option of the company, in amounts of not less than \$10,000 yearly. Each purchaser of a \$1,000 bond will receive also \$500 in the stock of the company. The total amount of stock authorized is \$500,000 in \$5 shares. The company has already a large quantity of ore in sight, and the money received for the bonds will be used to put up machinery and reduction works. It is expected that the issue will be readily taken up by the trade, especially as it is provided that holders of bonds may tender them at any time at par in payment for sulphur bought from the company. The property has been very carefully examined, and its value is certified by experts of high standing.

Liverpool. Nov. 24.

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

There is a fair trade reported in chemicals, although the demand has not been quite so brisk during the past week.

Soda ash is steady on spot but without any special feature. The spot range for tierces, as to market, is about as follows: Leblancash, 48%, £4 @ £4 5s. per ton; 58%, £4 5s. @ £4 10s. per ton; 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. For contracts over 1897 bids are invited, and prices vary considerably, according to export market.

Soda crystals are selling to a moderate extent, at £2 5s. @ £2 7s. 6d. per ton, less 5% for barrels, and 7% less for bags.

Caustic soda is firm for all positions. The range for either spot or forward delivery, according to market, is about as follows: 60%, £6 2s. 6d. @ £6 5s. per ton; 70%, £7 2s. 6d. @ £7 5s. per ton, net cash; 74%, £8 @ £8 5s. per ton; 76%, £8 15s. @ £9 per ton, net cash. Outside makes are so well sold over 1897 that it is now difficult to find any sellers of unbarred parcels for delivery named.

Bleaching powder is in better request, and for hardwood the range is £6 12s. 6d. @ £6 17s. 6d. per ton, net cash, as to destination.

Chlorate of potash has improved, and a good business reported for forward delivery, while 3¼d. has been refused for 1897 delivery, makers being now firm at 3¼d. to 4d. for any position.

Bicarb. soda is without change at £6 15s. per ton, less 2½% for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia has continued to droop and is now quoted at about £7 15s @ £8 per ton, less 2½% for good gray, 24% and 25% in double bags f. o. b. here, as to quality.

Nitrate of soda is a shade easier at £8 2s. 6d. @ £8 5s. 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%.

MINING STOCKS.

Complete quotations will be found on pages 530 and 531 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.
Pittsburg. San Francisco. London, England.
Cleveland, page 524. Denver, Colo. British Columbia.

NEW YORK, Friday Evening, Dec. 4.

The general course of the mining stock market during the past week has been uninteresting and with very few exceptions prices have ruled lower than we last reported.

Several of the Comstocks show higher prices this week, among them Savage, which advanced to 70c. with sales of 300 shares. Mexican, on the other hand, after selling at 66c. on November 30th, receded to 50c. on December 2d. The other stocks in this group were only traded in to a limited extent.

In the California group Brunswick Consolidated changed hands at 17@ 21c., with transactions of 4,000 shares. Quicksilver was the only other California stock dealt in; after an absence of a fortnight it sold at \$2, with sales of 100 shares.

Efforts were made to "lift" the Colorado stocks, and in consequence we note sales of 200 shares of Golden Fleece at 95c. This is a Cripple Creek stock which recorded its last transaction in June at \$1.50 @ \$1.70, Victor, a stock which has not been dealt in for several weeks, shows sales this week of 170 shares at \$6.50 @ \$6.88. Anaconda continued to sell rather heavily this week, showing sales of 1,600 shares at \$1.10 @ \$1.50. Portland, another high-priced Cripple Creek stock opened at \$1.30 and advanced to \$1.35, thus ruling lower than last week; sales were 300 shares. Two Leadville stocks were traded in this week; Iron Silver recorded its first transaction since November 11th; it was 500 shares, at 45c. Chrysolite, the other Leadville stock, changed hands at 10@ 11c. with dealings of 260 shares.

The new Mining Exchange has not yet completed its arrangements for the opening of its board-room, but expects to be in condition by January 1st. The Governing Committee, we are told, is busily engaged in listing dividend-paying properties.

Boston. Dec. 3.

(From Our Special Correspondent.)

Dullness and a tendency to lower prices is the record of the market for mining stocks the past week, for which the decline in copper is mainly responsible. The only really active stock was Butte & Boston, which has been freely bought on the strength of the settlement of the Davis Estate stock, advancing from \$5 to \$6.50 on sales of about 13,000 shares. Boston & Montana was neglected, and declined from \$93 to \$90 with recovery later to \$93, followed by reaction to-day to \$91½ and closing at \$92. Less than 4,000 shares changed hands.

Calumet & Hecla advanced to \$325 on small sales. Quincy advanced to \$119, but lost the advance, and sold at \$118. The scrip was steady at \$95. Tamarack declined from \$95 to \$94, recovering later. Kearsarge touched \$16, sold at \$15½ and closed at the former figure. O-cocla declined from \$30 to \$29 and later recovered to \$30½, with reaction to \$30. Atlantic gained \$1, with sales at \$21. Old Dominion has ruled very dull all the week, with sales at \$17½ and \$17¾ respectively, closing at the former figure. Wolverine was firm. After declining to \$8½ it advanced to \$8¾ and closed there. Tecumseh sold at \$3¾, Franklin sold at \$11 for 10 shares, and Arnold at 25c., recovering later to 50c.

In gold stocks, Pioneer was heavy and declined to \$4¼, but later sold at \$5, and to-day at \$5¼. Gold Coins was steady at \$3. Santa Ysabel declined to \$10½, but later advanced to \$11½ and closed there. Merced declined ½ to 7½. Boston & Cripple Creek sold at 10c., same as last week.

The market closed with a slightly firmer tendency.

Cleveland. Dec. 2.

(From Our Special Correspondent.)

The stock market has been dull for several days, and but few inquiries are reported. The stocks remain firm, however, which is due, the brokers say, to two facts, the advance of Minnesota and the declaration of a dividend of \$1, payable December 5th by the Republic Company. It is the belief of the dealers that during the winter months investors will appreciate the value of mining stocks and trading will result. This will naturally depend more or less on preparations made for work in the mines next year. The quotations follow:

Name of Company.	Par val.	Dec. 2.	
		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	30.00
Cincinnati Iron.....	25	10.00	13.50
Cleveland-Cliffs Iron Company.....	100	45.00	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	72.00	72.00
Pittsburg & Lake Anzeline.....	25	16.00	16.00
Republic Iron Company.....	25	16.00	16.00

Salt Lake City. Nov. 28.

(Special Report of James A. Pollock.)

This week's market was extremely strong, with the higher grade stocks leading on large transactions. The advance was big, quick and decisive.

and the market displayed a steadier tone than for months past. An encouraging outside buying movement is in evidence, and local interests are taking advantage of market conditions to quietly absorb stocks.

Ajax was slightly lower in the offerings, with only a small amount of the stock out. Again did Alliance and Anchor remain inactive, with absolutely no inquiry for the stocks. Bullion-Beck continued strong, and quotations ended fully \$1 above the market price of three weeks ago. There is practically no Centennial-Eureka in this market at present. Daly-West was firm, with buyers and sellers not very close together. Dalton was slightly stronger on limited buying. Galena was about unchanged, with only limited dealings in the stock. Geyser has about completed its mill increase, which will give the company a capacity of 100 tons per day. Horn Silver continues slow. Lucky Bill continued firm, although inactive. Mercur advanced to and above the \$7 mark, but with the close came a slight reaction, a very limited amount of the stock changing hands below the highest price. As indicated by me would be the case, Mammoth passed its November dividend. This action had been discounted by holders, however, and the stock did not change materially. Improvements being made at the properties are responsible. Northern Light continued quite strong at the 50c. mark. Ontario has declared its November dividend of 10c. per share. It is reported that the Sacramento will float 30,000 shares of its treasury stock at once. This company's properties adjoin those of the Mercur, and are equipped with a cyanide plant in operation. Swansea was in good demand, but at unchanged quotations, while South Swansea sold at slightly higher figures. Silver King was very strong, with extremely light offerings. Sunshine did considerable business at about last week's figures.

San Francisco. Nov. 28.

(From Our Special Correspondent.)

The market opened this week with prices a little firmer, but the quotations were made on small transactions mainly, and there was no outside business whatever. The holiday on Thursday stopped business for the day but made no change otherwise. At the close prices were still quite firm, but with very little actual business.

Chollar showed a decided improvement and is quoted to-day \$2.10@2.25; Consolidated California & Virginia, \$1.65@1.70; Ophir, \$1.30; Hale & Norcross, \$1.20@1.25; Potosi, 94c.@1; Best & Belcher, 84@85c.

I am able to report only very small dealings and little interest on the Gold Mining Exchange. Business was limited to a few sales of Savannah at 45@48c., and Lockwood at 25@27c.

The Eureka Consolidated Drift Mining Company has levied an assessment of 5c. per share, delinquent December 28th.

The Pacific Coast Borax Company has declared a dividend of \$5 per share. This is the first dividend in some time.

I find in this week's *News-Letter* a paragraph which is worth quoting, as follows: "The original price paid for the old Alabama mine is common talk here. Even poor old Jim Crossman, who believed he had closed a sale of the property shortly before his death, never claimed more than \$150,000 as the sum for which he had disposed of it, including his commission. Now that the English promoter has it in hand, those figures multiplied by four will about meet their ideas of what the English investor ought to disgorge for a piece of property which one of the sharpest and most experienced of our old California miners could not convert into a bonanza. A company has just been formed in London with a capital of £120,000, about \$600,000, to buy this property, which would go a-begging here for a century to come at a tenth of this amount. These are the kind of deals that injure the mining business in California. A few promoters benefit at the expense of the whole State."

British Columbia.

(From Our Special Correspondent.)

ROSSLAND, B. C., NOV. 27.

The settled winter weather, which has been unusually cold, has had considerable effect on the activities of the town and camp alike. The brokers continue to report many deals, chiefly with parties from the eastern provinces of Canada, but they do not expect any material changes in the quotations which have probably reached the winter level, until there is some phenomenal strike, such, for instance, as that made the other day in the Red Eagle, an entirely new proposition, though in a now well-known locality, as it adjoins, or is quite close to, the Mayflower.

Respecting English investments in the camp, I have been informed that a systematic presentation of West Kootenay properties, especially in the Trail Creek camp, will be made some time before spring, as it is claimed that so far very little reliable data as to the newer companies have been furnished the British public.

London. Nov. 21.

(From Our Special Correspondent.)

During the earlier portion of the past week the slump in South African stocks continued unabated, and there was every prospect of still further falls. At the fortnightly settlement, which occurred this week, two or three jobbers were involved in serious difficulties, and if they had been declared defaulters, the market would have suffered a considerable shock. So much was this failure dreaded, that the brokers who made a specialty of the stocks in which

they had become involved came forward and purchased the whole of their holdings. The presence of these influential firms as buyers had a most wholesome effect on the market. The bears stampeded and bought in, and as a consequence the market hardened all round and prices strengthened. Among the shares which suffered during the earlier portion of the week, Chartered and Consolidated Gold Fields were most prominent. Chartered fell to £2, but afterwards recovered. The prophets of evil withdrew all their rumors and it is surprising how contradictions were disseminated broadcast. The chief reason for the selling of Consolidated Gold Fields, to which I referred last week, was the desire of the South Africa Gold Trust, which is a large shareholder in Gold Fields, to sell sufficient stock to provide a dividend for themselves. The suppositions of internal knowledge of something wrong were therefore quite unfounded.

An announcement was made by the directors of the Chartered Company that the shareholders would, under no circumstances, be asked to pay the expected indemnity. The natural conclusion from this announcement is that Mr. Rhodes and Mr. Beit are to pay the indemnity, a statement which has been freely circulated as a mere guess.

The West Australian section has been dull, as usual, but, on the whole, the quotations have been stronger, owing to the publication of some favorable returns from the mines. It is good news to hear that a bureau of public information is to be started at Coolgardie to furnish statistical and other intelligence relating to West Australian mines on much the same lines as are followed by the Chamber of Mines at Johannesburg. The want of reliable information about West Australian mining has been a great drawback, and has been one of the causes of the present depression in the market.

Copper shares have been strong all the week. In this section two items of interest to the market may be noted. Firstly, the Rio Tinto Company has decided to split its ordinary shares into two divisions, that is to divide each £10-share into two of £5 each, one to be a preference share with a fixed cumulative dividend, and the other to be an ordinary share. This step has been taken to provide intending shareholders with two sets of shares, one which will serve as a safe investment and the other which will provide a speculative value. As the company possesses reserves to last for 70 years, this division of the stock is eminently desirable. The other is the further reduction of the capital of Mason & Barry. About a year ago this company found that its capital was far too great for the requirements of the business, so decided to reduce its shares from £5 to £4 by returning £1 in cash all round. Now it has been found possible to return a further £1, thus reducing the shares to £3. The reason for this reduction is the gradual narrowing of the company's operations. It is largely, if not entirely, with drawing from the copper trade, and is selling its pyrites chiefly for the sulphur contents.

Paris. Nov. 22.

(From Our Special Correspondent.)

There has been a good market this week, and in several directions speculation is active. The copper shares maintain themselves at a high point, and, it would seem, with reason.

The metallurgical shares also continue strong, and have lost nothing of their recent advances; rather strengthening their position than losing ground.

In the Russian stocks recent advances have resulted in some realization of profits, which has caused a slight reaction. This is not likely to continue, however. It is announced that Huta-Bankowa will pay a dividend of 90 fr., which is an increase of 25 fr. over that of last year.

The African gold stocks are weak, and there is a general apprehension respecting them which is not encouraging. The return of October production in the Witwatersrand is very disappointing to those who had looked for a substantial gain for the close of the year. Many would like to sell their stocks, but buyers are not readily to be found.

Attention has been drawn to the method adopted by a good many of the Transvaal companies in holding their annual meetings in Johannesburg instead of in London or Paris. This makes it impossible for shareholders to attend or make their influence felt, and is certainly an abuse, since it substitutes for the rule of the real owners the control of a small clique of speculators in the Transvaal. Stockholders are now urged to combine to suppress this doubtful plan. If they insist upon their rights they may succeed in abolishing this abuse.

The foreign commerce of France for the 10 months ending October 31st is reported by the Ministry of Commerce as below

	1895.	1896.
	France.	France.
Imports:		
Food.....	810,567,000	869,816,000
Raw materials.....	1,686,631,000	1,804,914,000
Manufactures.....	474,984,000	514,249,000
Totals.....	2,981,282,000	3,188,979,000

	1895.	1896.
	France.	France.
Exports:		
Food.....	466,175,000	514,804,500
Raw materials.....	717,465,000	676,269,000
Manufactures.....	1,438,380,000	1,506,667,000
Postal parcels.....	81,660,000	117,830,000
Total.....	2,703,680,000	2,815,561,000

Excess, imports.....	274,602,000	373,018,000
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The increase of 27,297,000 fr. in imports was large and there was also the substantial gain of 107,881,000 fr. in exports, so that the excess of imports over exports showed an increase of 99,416,000 fr. for the

ten months. A gain in the exports of manufactures shows very well.

The gold movement in France as reported for October and the ten months ending October 31st was as follows:

	October.	Ten mos.
	France.	France.
Imports.....	8,104,603	272,134,910
Exports.....	44,770,330	234,310,878
Excess.....	Exp. 36,665,722	Imp. 37,824,032

A large part, over one half, of the exports in October went to the United States.

We hear with pleasure of improving business on your side, and trust that you will address yourselves to the work you have to do with courage. You have my best wishes for success. AZOTE.

ASSESSMENTS.

Name of Co.	Loc'n.	No.	Divq.	Sale.	Amt
Anita Gold.....	Cal.....	11	Nov. 23	Dec. 12	.05
Atlas.....	S. D.....	10	" 10	" 10	.001
Bay State.....	Cal.....	34	Dec. 7	" 28	.05
Buckeye.....	Utah.....	" 2	" 2	" 18	.01
Challenge Con.....	Nev.....	22	Nov. 17	" 8	.10
Comstock Sil- ver.....	Utah.....	"	Dec. 14	Jan. 4	.10
Elk Mountain.....	S. D.....	"	Nov. 30	Dec. 31	.0003
Exchequer.....	Nev.....	39	" 18	Jan. 11	.05
*Far West G. & S.....	S. D.....	14	Jan. 9	" 30	.003
Flint Creek.....	Mont.....	"	Oct. 5	Dec. 15	.0024
Gibraltar Con.....	Cal.....	12	Nov. 23	" 19	.001
Gold Valley.....	"	1	Dec. 10	" 26	.10
Horseshoe Bar Con.....	"	5	" 5	" 26	.10
Justice.....	Nev.....	61	Nov. 17	" 8	.05
*Last Chance.....	Ida.....	"	Dec. 19	Jan. 9	.0114
Morning Star.....	Nev.....	"	" 2	Dec. 26	.005
Mt. Diablo.....	"	5	Nov. 30	" 21	.10
North Gould & Curry G. & S.....	"	17	Dec. 5	" 22	.10
*Occidental Con. Seg. Belcher & Mides Con.....	Cal.....	25	" 29	Jan. 18	.15
Silver King.....	Cal.....	18	Nov. 21	Dec. 11	.10
Snowflake.....	Utah.....	15	Dec. 7	Jan. 5	.25
Wm. Tell Con Gold.....	Utah.....	"	" 29	" 22	.01
	Cal.....	"	Nov. 23	Dec. 21	.00094

* New assessment.

DIVIDENDS.

NAME OF COMPANY	Current Divi- dends.		Paid since Jan. 1, 1896.	Total to date.
	Date.	Am't.		
Alta Con.....	Dec. 10	\$10,000	\$40,000	\$80,000
Alaska-Mexican.....			70,200	173,031
Alaska-Treadwell.....			350,000	3,025,000
*Anaconda.....			2,250,000	2,250,000
*Anchoria-Leland.....			12,000	24,000
Aurora Iron.....			50,000	700,008
Bangkok-Cora Bell.....			6,000	107,510
Big Six.....			2,500	2,500
*Boston & Mont.....			1,500,000	4,925,000
*Bullion-Beck & Ch. Calumet & Hecla.....	Dec. 17	500,000	2,500,000	46,850,000
Cariboo.....	" 7	16,000	75,410	125,410
*Centennial-Eureka C. O. D.....			367,000	1,897,000
Coronas.....			5,000	25,000
Dalton & Lark.....			3,500	3,500
Daly.....			87,500	87,500
Deadwood Terra.....			37,500	2,887,500
De Lamar.....			100,000	1,240,000
Dominion Coal.....			204,000	2,194,000
*Elkton Con.....			600,000	146,960
Florence.....			70,000	89,348
*Galena.....			54,390	61,000
*Garfield Grouse.....			55,000	12,000
*Gold Coin.....			12,000	100,000
Golden Eagle.....			85,000	10,000
Golden Globe.....			10,000	757,179
Gold & Globe Hill.....			158,000	28,875
Hecla Con.....			19,500	2,130,000
Helena & Frisco.....			30,000	475,000
*Highland.....			50,000	3,224,918
*Homestake.....			140,000	6,058,250
*Hope.....			343,750	632,262
Horn Silver.....			40,000	5,130,000
Iowa.....			50,000	50,000
Iron Mountain.....			50,000	145,000
Isabella.....			180,000	202,500
Jackson.....			7,500	475,000
*Le Roi.....			175,000	250,000
*Mammoth.....			60,000	1,150,000
*Mercur.....			175,000	550,000
Minnesota Iron.....			495,000	3,240,000
Mont. Ore Pur. Co.....			320,000	480,000
Moon-Anchor.....			24,000	24,000
Moose.....			8,000	185,000
Mt. Rosa.....			10,000	30,000
Napa Con.....			70,000	810,000
New Elkhorn.....			72,000	72,000
*Ontario.....			165,000	13,340,000
Osceola Con.....			125,000	2,072,500
Ottawa.....			1,000	1,000
*Pan American.....			3,000	27,000
*Portland.....			210,000	833,000
Quincy.....	Dec. 8	300,000	1,000,000	8,670,000
Sacramento.....			2,000	2,000
*Silver King.....			375,000	825,000
Slocan Star.....			200,000	250,000
Small Hopes.....			25,000	3,275,000
Smuggler-Union.....			100,000	100,000
Swansea.....			15,000	15,500
Tamarack.....			150,000	4,320,000
Union.....			23,500	73,000
*Utah.....			22,000	175,000
Utah Con.....			3,000	3,000
Victor.....			200,000	665,000
Victor M. & L.....			12,000	42,000
War Eagle.....			55,000	187,500
Wasp.....			40,000	40,000
Totals.....		\$828,000	\$14,017,250	\$129,027,733

* November dividend paid.

STOCK QUOTATIONS.

BOSTON, MASS.*

Table of stock quotations for Boston, Mass. listing companies like Alouez, Arnold, Atlantic, Bost. & C.C., etc., with columns for location, par value, and prices for various dates from Nov. 27 to Dec. 3.

*Official quotations Boston Stock Exchange. Total sales, 29,838.

NEW YORK.*

Table of stock quotations for New York listing companies like Ajax, Alamo, Alice, Alliance, Amer. Flag, etc., with columns for location, par value, and prices for various dates from Nov. 28 to Dec. 4.

*Official quotations N.Y. Stock and Con. Stock & Petroleum Exchs. Total shares sold, 11,930.

INDUSTRIAL COAL AND COAL RAILROAD.*

Table of stock quotations for Industrial Coal and Coal Railroad listing companies like Balt. & Ohio, Ches. & Ohio, Col. C. & I. Dev., etc., with columns for par value and prices for various dates from Nov. 28 to Dec. 4.

*Official quotations N.Y. Stock Exchange. Total shares sold, 148,945.

COLORADO SPRINGS, COLO.†

Table of stock quotations for Colorado Springs, Colo. listing companies like Ajax, Alamo, Am'ric'n C, Anaconda, etc., with columns for par value and prices for various dates from Nov. 23 to Nov. 28.

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

SAN FRANCISCO, CAL.*

Table of stock quotations for San Francisco, Cal. listing companies like Alta, Belcher, Best & Belcher, Bodie Con., etc., with columns for location, par value, and prices for various dates from Nov. 27 to Dec. 3.

*Official telegraphic quotations, San Francisco Stock Exchange.

BALTIMORE, MD.*

Week ending Dec. 3.

Table of stock quotations for Baltimore, Md. listing companies like Balt. M. & S., Conard Hill, Con. Coal, etc., with columns for location, par value, bid, and ask prices.

*Official quotations Baltimore Stock Exchange.

BRITISH COLUMBIA.*

Week ending Nov. 27.

Table of stock quotations for British Columbia listing companies like Bound Creek, Old Iron Sides, Cariboo M. & S.Co., etc., with columns for name, selling price, and other details.

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

LONDON.

Nov. 20.

Table of mining stock prices in London, listing companies like Nth Americans, Alaska-Treadwell, and others with columns for country, product, capital stock, and price.

DENVER, COLO.

Table of mining stock prices in Denver, Colorado, listing companies like L'd Mines, Anaconda, and others with columns for company name, par value, and price.

PARIS. Week ending Nov. 20.

Table of mining stock prices in Paris, listing companies like Acieries de Creusot, Agnes Tenidas, and others with columns for country, product, capital stock, and price.

MEXICO. Week ending Nov. 26.

Table of mining stock prices in Mexico, listing companies like Amistad y Concordia, Angustias, and others with columns for state, shares, and price.

VALPARAISO, CHILE.

Sept. 17.

Table of mining stock prices in Valparaiso, Chile, listing companies like Arturo Prat, Caracoles, and others with columns for capital, share value, and price.

SHANGHAI, CHINA.

Nov. 1.

Table of mining stock prices in Shanghai, China, listing companies like Jelebu M. & Trad., Funjom M. Co., and others with columns for country, shares, and price.

SALT LAKE CITY, UTAH. Week ending Nov. 28.

Table of mining stock prices in Salt Lake City, Utah, listing companies like Ajax, Allance, and others with columns for stock type, par value, and price.

PHILADELPHIA PA.

Table of mining stock prices in Philadelphia, PA, listing companies like Cambria Iron, Choc. & G.H. Cifs, and others with columns for location, par value, and price.

HELENA, MONT.

Week ending Nov. 27.

Table of mining stock prices in Helena, Montana, listing companies like Am. Dev. & M. Co., Bald Butte, and others with columns for location, par value, and price.

PITTSBURG, PA.

Week ending Nov. 28.

Table of mining stock prices in Pittsburgh, PA, listing companies like Mansfield, N.Y. & C. Gas Co., and others with columns for location, par value, and price.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last), and Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last).

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. + The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. † Previous to the consolidation in August, 1884, the California had paid \$81,330,000 in dividends and the Cons. Virginia \$42,380,000. | 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.

CLASSIFIED LIST OF ADVERTISERS.

Air Compressors and Rock Drills. American Diamond Rock Drill Co. Bull. Co. & Mfg. Co. ...

Air Hoists. Whiting Foundry Equipment Co. Amalgamators. Bucyrus Steam Shovel & Dredge Co. ...

Anti-Friction Metals. Besly, Chas. H., & Co. Chester Steel Cast. Co. Anti-Cut. Goets, Otto. ...

Architects and Builders. Berlin Iron Bridge Co. Pittsburg Bridge Co. Assayers and Chemists. Ainsworth, Wm. Baker & Adamson. ...

Attorneys, Corporation. Emig, C. E. McCall & Hamilton. Babbitt's Metal. Besly, Chas. H., & Co. ...

Banks and Brokers. Artell, E., & Co. Blackett, J. et. Clair. Bonbright, W. P. & Co. ...

Belt Lacing. Bristol Co. Blasting Caps. Metallic Cap Mfg. Co. Rheinisch Westphalian Explosive Co. ...

Blasting Batteries, Caps and Fuse. Climax Fuse Co. Lau, J. H., & Co. Blowers, Pressure. Connorsville Blower Co. ...

Bolters. Denver Eng. Wks. Co. Fraser & Chalmers. Philadelphia Eng. Wks. Ltd. ...

Brattice Cloth. Besly, Chas. H., & Co. Brick Machinery. Chisolm, Boyd & White Co. ...

Bridges. Berlin Iron Bridge Co. Shiffer Bridge Co. Car Wheels. Whiting Foundry Equipment Co. ...

Carbons. New York Diamond Drill Co. Chain and Link Belting. (See Belting.) Chemicals. Penn. Salt Mfg. Co. ...

Chemists. Simonds & Wainwright. Chilled Castings. Whiting Foundry Equipment Co. Coal. Sewing-White Coal. ...

Coal Cutters. (See Machinery.) Ingersoll-Sergeant Drill Co. Jeffrey Mfg. Co. Leyner, J. Geo. ...

Coal Washing Machinery. Cuninghame & Co. Jeffrey Mfg. Co. Compressors. Clayton Air Compressor Works. ...

Concentrators, Crushers, Pulverizers, Separators, Etc. Blake, E. F. Bradley Pulverizer Co. ...

Conveying Belts. Robins Conveying Belt Co. Copper Dealers and Producers. American Metal Co. ...

Copper Dealers and Producers. American Metal Co. Arizona Copper Co. Atlantic Mining Co. ...

Corrugated Iron. Berlin Iron Bridge Co. Cincinnati Corrugating Co. Sykes Steel Roofing Co. ...

Cranes. Whiting Foundry Equipment Co. Machinery, Graphite, etc. Standard Fire Brick Co. ...

Cyanide Pumps. Gas Light & Coke Co. Roessler & Hasslacher Chem. Co. ...

Diamonds. Berlin Iron Bridge Co. New York Diamond Drill Co. Diamond Drills. Bullock Mfg. Co., M.C. ...

Draughtsmen. Young, Wm. R. Drawing Materials. Aloc, A. S. Co. Besly, Chas. H., & Co. ...

Dredges. Bucyrus Steam Shovel & Dredge Co. Marion Steam Shovel Co. Dryers. Brown, Horace F. ...

Dump Cars. Denver Eng. Works Co. Hendrie & Bolthoff Mfg. Co. Educational Institutions. Arizona School of Mines. ...

Electric Batteries. Macbeth, James, & Co. Electrical Machinery and Supplies. American Engine Co. ...

Elevators, Conveyors and Hoisting Machinery. Brown Hoist & Conv. Mach. Co. ...

Emerald Wheels. Besly, Chas. H., & Co. Engineers, Chemists, Metallurgists. See Directory Pages 4, 5 and 6. ...

Engineer's Instruments and Supplies. Aloc, A. S. Co. Buff & Berger. ...

Excavators. Bucyrus Steam Shovel & Dredge Co. Marion Steam Shovel Co. Vulcan Iron Works. ...

Fuses. Climax Fuse Co. Ingersoll-Sergeant Drill Co. Standard Fuse Co. Gas Engines. Hercules Gas Engine Works. ...

Gas Works. Pollock, Wm. B. & Co. | Wood, R. D. & Co. Gauges, Recording, etc. Bristol Co. ...

Gearing. Besly, Chas. H., & Co. | Denver Eng. Wks. Co. Chester Steel Cast. Co. | Fraser & Chalmers. ...

Grasses, Graphite, etc. Besly, Chas. H., & Co. | Dixon, Jos., Crac. Co. Heavy Machinery. Denver Eng. Works Co. ...

Hose, Rubber, Etc. New York Belting & Packing Co. Ltd. Hydraulic Rame. Power Specialty Co. ...

Insulators. Jenkins Bros. Insulated Wires and Cables. Okonite Co., Ltd. ...

Insurance Companies. Hartford Steam Boiler Inspect'n and Ins. Co. Mutual Life Insurance Co. ...

Lead Lining for Chlorination Tubs. Raymond Lead Co. Locomotives. General Electric Co. ...

Lubricators. Detroit Lubricator Co. Machinery. Dealers in Mining, Milling and Other Machinery. ...

Allis, Edw. P. & Co. American Diamond Rock Drill Co. Besly, Chas. H., & Co. ...

Boiler, H. W., & Co. Card Electric Co. Colorado Iron Works. Connersville Blower Co. ...

Cook, W. A. & Bros. Cuninghame & Co. Denver Eng. Wks. Co. Fraser & Chalmers. ...

Hammond, Mfg. Co. Hendrie & Bolthoff Mfg. Co. Ingersoll-Sergeant Drill Co. Jeffrey Mfg. Co. ...

Jessop, W. & Sons, Ltd. Leyner, J. Geo. Lidgerwood Mfg. Co. Krupp, F. ...

McKernan Drill Co. American Dev. & Mg. Co. American Metal Co. Am. Zinc-Lead Co. ...

Baker & Co. Bath, Henry & Son. Besly, Chas. H., & Co. Bridgeport Copper Co. ...

Chick, L. A. & Co. S. L. & Co. Cookson & Co. Elliott's Metal Co., Ltd. ...

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American Dev. & Mg. Co. Fraser & Chalmers. Kendall Gold & Silver Extraction Co. ...

Baker & Co. Shabach & Ref. Co. Baltimore Copper Works. Bridgeport Copper Co. ...

Conn. Kas. City S. & R. Co. Cookson & Co. Denver Eng. Wks. Co. Elliott's Metal Co., Ltd. ...

Electro Cyanide Gold & Silver Electro. Foster, Blackett & Wilson. Mine Cars. Denver Eng. Wks. Co. ...

Hendrie & Bolthoff Mfg. Co. Hunt, C. W., Co. Nelsonville Foundry & Machine Co. Whiting Foundry Equipment Co. ...

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Brandt, Randolph. Goodsell, Packing Co. Jenkins Bros. Hine & Robertson. ...

Publications. American Fertilizer. Mining Investor. Mining Journal. Scientific Pub. Co. ...

Denver Republican. El Minero Mexicano. Indian Engineering. Pumps. Blake, Geo. F. Mfg. Co. ...

Cameron A. S. Steam Pump Works. Denver Eng. Wks. Co. Fraser & Chalmers. ...

Jeansville Iron Works. Quarrying Machines. Ingersoll-Sergeant Drill Co. ...

Rand Drill Co. Sullivan Machinery Co. Quicksilver. Sureka Co. ...

Railroads. Atchison, Topeka & Santa Fe Ry. Chicago & N. West. R. R. ...

Denver & Rio Grande R. R. Denver, Leadville & Gunnison Ry. Florence &ripple Creek R. R. ...

Illinois Central R. R. Midland R. R. of Kentucky. Pike's Peak Mining Tunnel Railway. ...

Rio Grande Southern R. R. Southern Railway. U. P., D. & G. R. R. Railroad Supplies and Equipment. ...

Hunt, C. W., Co. Robinson & Orr. Fortier, H. K., & Co. (See Machinery.) Regulators, Damper, Heat, Etc. ...

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Phelps, Dodge & Co. Shiffer Bridge Co. Sykes Steel Roofing Co. Rubber Goods. New York Belting & Packing Co., Ltd. ...

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Shoes and Dies. Chester Steel Cast. Co. Chrome Steel Works. Crescent Steel Co. ...

Denver Eng. Wks. Co. Fraser & Chalmers. Crescent Steel Co. Shovels (Steam). Bucyrus Steam Shovel & Dredge Co. ...

Marion Steam Shovel Co. Smelting and Refining Works. Balbach S. & Ref. Co. ...

Orford Copper Co. Penna. Salt Mfg. Co. Penna. Smelting and Refining Works. ...

Phosphor-Bronze Smelting Co. Steel Rails, Castings, Rolls, Drill Steel. Bethlehem Iron Co. ...

Chester Steel Cast. Co. Pollock, Wm. B. & Co. Robinson & Orr. ...

Taylor Iron & Steel Co. Tanks. (See Metal Dealers.) Denver Eng. Wks. Co. Williams Mfg. Co. ...

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Praet & Whitney Co. Tubes. Besly Chas. H., & Co. | Pollock, Wm. B. & Co. ...

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Vulcan Iron Works. Publications. American Fertilizer. Mining Investor. ...

Mining Journal. Scientific Pub. Co. So. African Mg. Jour. ...

Zeitschrift fur Praktische Geologie. Snow Steam Pump Co. ...

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Worthington, Henry R. Publications. American Fertilizer. Mining Investor. ...

Mining Journal. Scientific Pub. Co. So. African Mg. Jour. ...

POSITIONS VACANT.

FREE ADVERTISING

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 AS- sayer 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.

SITUATIONS WANTED.

Advertisements for SITUATIONS WANTED will be charged only 10 cents a line.

CIVIL ENGINEER, GRADUATE, 20 YEARS' experience, buildings, harbor work, railroads, also superintendent large industry, has worked in Europe, United States and Africa, wishes position of trust; highest references. Will go anywhere to represent American interests or developments. Address COSMOS, ENGINEERING AND MINING JOURNAL, No. 17,873, Dec. 12.

SOUTH AMERICA—YOUNG METALLUR- gist, kept home by family troubles since leaving college, now desires to follow profession, preferably in South America. Has had good business experience and has proved engineering capacity and ingenuity. Best of references from positions held in East. Address FOREIGN, ENGINEERING AND MINING JOURNAL, No. 17,872, Dec. 12.

ASSAYER AND CHEMIST, GRADUATE of Northwestern University, '95, desires position; experience limited; best of references. Address N. W. U., ENGINEERING AND MINING JOURNAL, No. 17,859, Dec. 12.

A PARIS ENGINEERING AGENT, REPRE- senting in France an important cotton-belted company, desires to represent American manufacturers of patent articles, such as tools, wood split pulleys, etc. First-class references. Apply, with particulars, to H. AUTRAN, 21 Mining Lane, London, E. C., England, No. 17,893, Dec. 12.

ASSAYER AND MILL SUPERINTENDENT wants position; eight years' practical experience in laboratory and as superintendent of gold and silver mill. Experienced also in ore sampling. Best of reference as to character and ability. Address J. F., ENGINEERING AND MINING JOURNAL, No. 17,897, Dec. 12.

CHEMIST AND ASSAYER NOW IN MEX- ico desires a position in a Spanish-speaking country. Capable of assuming position of assistant superintendent of small lead-silver blast furnaces. Address W., ENGINEERING AND MINING JOURNAL, No. 17,880, Feb. 13.

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

A MECHANICAL ENGINEER, 34 YEARS of age, who has for the last three years conducted an 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.

A AMERICAN, 36 YEARS OLD, WHO HAS had eight years' experience as assistant manager and manager of hydraulic mines operated by English companies in South America, desires position as superintendent of placer mine. Speaks Spanish fluently. Good references. Address B. S., ENGINEERING AND MINING JOURNAL, No. 17,868, Dec. 12.

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 MA- chinist. 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.

MINING ENGINEER AND METALLUR- gist, graduate of Lehigh University, desires a position with responsible company. Address D. G., ENGINEERING AND MINING JOURNAL, No. 17,879, Dec. 12.

FIRST-CLASS ASSAYER DESIRES A POSI- tion 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.

SUPERINTENDENT, MANAGER, CHIEF Engineer—Capable engineer, aged 40, with large company, desires, for satisfactory reasons, to change; has energy, executive ability, experience in management and direction of large forces of men and familiarity with business methods; has thorough experience in iron and steel works, construction and management steam, hydraulic engineering, boiler and structural work; is a graduate engineer; speaks three languages; has a large acquaintance in engineering circles; refers to present employers and prominent engineers. Address ENERGY AND EXPERIENCE, F. W. Skinner, 277 Pearl street, New York City, No. 17,860, Dec. 26.

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.

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.

DREDGING—U. S. Engineer Office, New London, Conn.—Sealed proposals in triplicate for dredging in Cos Cob Harbor, Greenwich Harbor, Stamford Harbor, Five Mile River Harbor, Norwalk Harbor and Bridgeport Harbor, Conn., will be received here until December 17th, 1896. Information furnished on application. SMITH S. LEACH, Capt., Engrs.

BREAKWATER.—U. S. Engineer's Office, 1428 Arch street, Philadelphia, Pa.—Sealed proposals in triplicate, will be received here until December 10th, 1896, and then publicly opened, for constructing stone breakwater in Delaware Bay, Del. Information furnished on application. C. W. RAYMOND, Major, Engrs.

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.

LIGHTING.—Notice is hereby given that sealed proposals will be received by the Common Council of the city of Frankfort, Ind., at the office of the City Clerk, up to December 18th, 1896, for the furnishing and constructing of an electric lighting system for lighting the streets of Frankfort on the basis of a three years' contract, and also on the basis of a five years' contract. The successful contractor to receive from said city a contract for lighting the streets for a term of three or five years with one hundred arc lamps, 2,000 c. p., all night schedule, every night. A franchise for commercial lighting will also be granted the successful contractor. Also, at the same time and place sealed proposals will be received for the furnishing and constructing of a plant for lighting the streets of Frankfort by the "IMPROVED WELSBACH SYSTEM" of gas street lighting on the basis of a three years' and also a five years' contract. The successful contractor to receive from said city a contract for lighting the streets for a term of three or five years with 500 or more Welsbach gas lights of the improved pattern, 55 c. p., all night schedule, every night. A franchise for commercial lighting will also be granted the successful contractor. Each bid must be accompanied by a certified check for five hundred (\$500) dollars, made payable to the city of Frankfort to insure the good faith of the bidder. All work to be done and contracts entered into according to the plans and specifications now on file in the City Engineer's Office. Copies of specifications may be had on application to the City Engineer. ALONZO J. HAMMOND, City Engineer.

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 with a certified check in the sum of \$300 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.

DREDGING PLANT—U. S. Engineer Office, Mobile, Ala.—Sealed proposals for hire of dredging plant to be operated on dredged channel of Mobile River and Bay will be received here until December 19th, 1896. Information furnished on application to WM. T. ROSSELL, Major, Engrs.

THE ENGINEERING AND MINING JOURNAL

ADVERTISING RATES.
(NONPAREIL MEASUREMENT.)

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	6	1/4	\$2	\$5	\$12	\$20	\$28	\$34
	9	3/4	3	6	16	28	38	47
	12	1	3	8	20	35	47	60
	15	1 1/4	4	9	24	42	57	73
	18	1 3/4	4	11	29	50	68	87
	21	2	5	12	33	58	78	100
	24	2 1/4	5	14	38	66	89	113
	27	2 3/4	6	16	42	72	98	125
	30	3	6	17	46	79	108	140
1/2 Column.	33	3 1/4	7	19	50	86	117	151
	36	3 1/2	8	20	54	93	126	161
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	42	3 3/4	9	23	61	106	143	183
	45	3 3/4	9	24	65	112	151	194
	48	4	10	25	68	118	160	204
	51	4 1/4	11	28	75	129	175	224
	54	4 1/2	12	30	81	141	190	243
1/2 Column.	57	4 3/4	13	32	87	151	205	261
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	63	5 1/4	15	37	99	171	232	303
	66	5 1/2	16	39	105	181	242	322
	69	5 3/4	17	41	109	190	258	346
	72	6	18	43	115	200	271	362
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	108	9	19	47	126	216	296	390
	114	9 1/2	20	49	132	223	300	405
	120	10	21	51	137	228	322	411
	126	10 1/2	22	53	143	248	340	428
1/4 Page....	132	11 1/4	22	55	149	258	349	446
1/4 Page....	138	11 3/4	22	57	155	268	360	464
1/4 Page....	144	12	23	59	161	278	371	482
Full Page.	150	12 1/2	24	61	167	288	382	500

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Thomson-Houston, H. I.; one 450-light Edison, 25 K. W.; one
500-light Western Electric; one 540-light Edison, 30 K. W.;
one 550-light Mather, compound wound; one 600 light Western
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LES GOLD MINING CO.,** 449 The Wilcox Building,
Los Angeles, Cal. Dec. 5, 13w

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WORKS OF THE PHOSPHATE MINING CO., LIMITED.

Under order of the United States Circuit
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The valuable piece of property, being the
works of the Phosphate Mining Co., Limited,
generally called Brotherhood's, situated about 1 1/2
miles from Port Royal, S. C., consisting of about
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on Battery Creek of 971 feet, with fine wharves,
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On property is fine large open shed some 240
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Trains run to and from New York every hour.
Railroad switch 15 feet from building.

Address **Estate J. COUPER LORD,**
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Oct 17, 8w

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dress, in confidence, **P. O. Box 2324,**
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WANTED—CAPITAL TO DEVELOP A
new and promising mining field—Gold and Sil-
ver. Address **S. L. HEYWARD,** Bucksport, Maine.

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tical Metallurgist, who is now, as for the past 20
years, holding the position with ample salary as
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roundings are not satisfactory for a man of family (age
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Eastern city or California, where his family can have
educational advantages. Has directed the financial as
well as the practical business of large operation. Ref-
erences furnished for honest and conscientious dis-
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—References on Application.—

Moring & Neil's Code Used.

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DIVIDENDS.

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 26th, 1896.
PERCY HAGERMAN,
Vice-President and Treasurer.

Received Too Late for Classification.

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 thor-
oughly qualified and experienced in modern blast fur-
nace practice and refining; a good position to the right
party; answer with references. Address **MAHNET,**
ENGINEERING AND MINING JOURNAL. Dec. 12.

1504 WANTED—THOROUGHLY COM-
petent 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.

CONTRACTS OPEN.

Continued from Page 18.

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

GUN EMPLACEMENT.—U. S. Engineer Office,
337 Congress street, Portland, Me.—Sealed proposals for
constructing gun emplacements at Fort Constitution,
N. H., will be received here until December 10th, 1896.
Information furnished on application. **A. N. DAM-
RELL,** Lieutenant Colonel, Engineers.

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.

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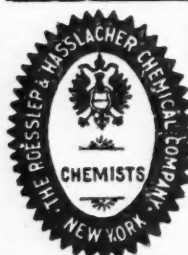
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