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We reprint the valuable article written by Mr. Albert H. Low on "The Copper Assay by the Iodide Method," which appeared in our issue of May 9th, as by inadvertence some foreign matter was introduced and not eliminated by the proof-readers.

There is still considerable uncertainty, and, naturally, anxiety as to the final commutation of sentence upon the leaders of the Reform Committee of Johannesburg, and the so-called minor offenders still under serious sentence. It is stated that some are to be released at once on payment of a fine and the banishment sentence will be canceled; others will have to serve five months and some one year. Mr. Victor Clement, formerly of the "Bunker Hill & Sullivan mine," in Idaho, is among those who have to exercise five months' patience, while Captain Mein and Mr. Butters are more fortunate in being released at once.

Considerable comment has been made by ourselves and other plain spoken members of the press on the fact that rail makers in this country can afford to make contracts at \$6 a ton less for shipment abroad than they will supply the same goods to enterprising corporations or individuals at home who may desire to build up some new section of country or extend some railroad system by a possibly profitable feeder.

We find the same treatment is dealt out to contractors, retailers and ultimately to poor householders in the matter of nails. By the use of brains, intelligence and the spur of competition we can produce the best and the cheapest nails in the world! But why should these nails be sold abroad 40 per cent. cheaper than in this country?

There seems to be something contagious in this competition for foreign trade. Belgium supplies iron to India at a lower price than in Belgium and recently 10,000 tons of rails have been sold to the North China Railway Company from England at a price supposed to be very much below the nominal prices.

A pointed remark is made by one of our London contemporaries on this subject and it is worth the attention of our large manufacturers to think over, viz., that this system of quoting "nominal prices much above real prices cuts two ways." Possibly buyers will find out that they can place their orders more to their own advantage through a foreign channel.

Harney Peak.

It is about two years since we recorded the appointment of a receiver for the Harney Peak Tin Mining, Milling and Manufacturing Company, and commented upon the unusual sagacity of the courts in naming for this position a man familiar with tin and other mines and their products. We think it was the general expectation that the parties most interested would, by taking receiver's certificates or otherwise, place the receiver in funds with which he could demonstrate by intelligent sampling and development what is the average assay in tin of the principal prospects which are the property of this unfortunate company. It is well known that under the original management vast sums were expended in the purchase of claims, numbering over 300, in the erection of costly mills, the laying out of the town sites, etc., etc., while comparatively little was expended in development work, so little, in fact, that on most of the properties the assessment work had not yet been sufficient to enable the company to acquire a patent.

Two years have dragged along, and for some reason the problem is no nearer a solution. The lawsuit, as in all similar cases, is dragging its slow length, and has proceeded no further than the examination of one witness in New York and some three or four in South Dakota. Considering the number of high-priced lawyers involved on both sides of the case in this country, to say nothing of the London solicitors, at least \$100,000 must have been expended in legal warfare, when probably one-half of this amount carefully expended by Dr. Ledoux, the Receiver, would have determined the question whether there was tin in any of the properties likely to be worked remuneratively. The pity is the greater since the discovery of gold in the southern hills has surrounded the Harney Peak property with little prospects and a few real mines which show gold to an extent rendering it likely that profitable mines may be established in the district.

The Safety of Cylinders for Compressed Gas.

A report has just been presented to the Home Office at London on the causes of explosion and the precautions required to insure the safety of cylinders of compressed gas. This report was drawn up by a committee of experts consisting of Professor Unwin, Dr. Dupré, and others, and it is the result of exhaustive inquiry and experiment. As it occupies 70 pages, foolscap size, of closely printed matter it is not possible here to do more than indicate the main conclusions and recommendations, but we advise all who use or make compressed gas cylinders to read it at length.

There are three general reasons for explosions, viz., the ignition of an explosive mixture of gases, the overcharging of cylinders when the gases are in the liquified state, and the faulty construction of cylinders.

As regards the first reason, very little light is thrown by the committee's investigations on the means by which the mixed gases become ignited. The two explanations are (1) that if any oil is present in the cylinder the act of charging will generate sufficient heat to ignite the oil and so produce an explosion, and (2) that pyrophoretic particles of iron become detached from the inside surface, and in falling through the gas become ignited. Neither of these two explanations is of much value, for in the first case the explosion would take place on charging and not at some undefined subsequent epoch, and in the second case the explanation is far fetched and is not confirmed by the series of experiments carried out by committee.

The second reason is the source of many accidents. If a cylinder is fully charged with liquified gas, such as anhydrous ammonia or carbonic acid, a very little expansion by heat will generate such an internal pressure as to burst the cylinder. In practice it is found necessary to fill the cylinders no more than four-fifths of their internal volume, and so to allow sufficient space for the gas to take up the expansion of the liquid.

The third reason, the faulty construction of the cylinders, is probably, the cause of most of the accidents, and to prevent them arising from this cause very great care has to be exercised in the manufacture and testing of the cylinders. There are three chief ways in which the cylinders can be faulty. Firstly, the sheet may be too brittle; secondly, it may not have been properly annealed, and thirdly, the cylinder may be made too thin. After careful investigation the committee have drawn up certain recommendations in connection with the manufacture of the cylinders, by which perfect safety will be insured. In seamless steel cylinders the working pressure must not exceed 120 atmospheres; and the resultant stress must not exceed eight tons per square inch. The carbon contents must not be over 0.25 per cent nor the iron contents less than 99 per cent. The tenacity must not be less than 26 tons nor greater than 33 tons per square inch and the ultimate elongation not less than 1½ inches in 8 inches. The proof pressure in the hydraulic test must be 224 atmospheres and the permanent stretch shown by water jacket must not exceed 10 per cent. of the elastic stretch. One cylinder in fifty should be subjected to a statical bending test and should stand crushing nearly flat between rounded knife edges without cracking. The recommendations are in connection with cylinders used for oxygen, hydrogen and coal gas, etc., and separate recommendations are given for those used for storing liquified gases. Very full recommendations are also given for handling and inspection, but for these we have not space.

The Welsbach Patents in the English Courts.

After much delay, the actions in the English court by the Incandescent Gas Light Company against the De Mare Company and the Sunlight Incandescent Gas Light Company for infringement of the Welsbach patents were heard before Mr. Justice Wills in the Queen's Bench division during the week ending April 18th. On the last-mentioned date the judge gave his decision in both actions, and briefly, before entering into details, we may say that the practical results are that the De Mare system is pronounced an infringement, while the Sunlight system is not. The patent on which the plaintiffs relied is that granted to Welsbach and numbered 15,286, of 1885. In this patent the inventor claims the use of a mantle made by impregnating a fabric with the salts of the rare earths, ammoniating and igniting, so as to leave a skeleton of the oxides of the metals of the rare earths, the mantle thus formed having the property of glowing with an intense light when subjected to the heat of a gas flame. In the De Mare system the structure used is not a circular mantle, but is a plume or fringe of loose threads hung from a platinum wire and disposed in a plane, so as to be adapted for use in connection with an ordinary fishtail gasburner. The composition of the solution with which the threads were to be treated is to all intents and purposes identical with that used in the Welsbach system, but the threads after impregnation are not ammoniated but ignited at once. In replying to the action, the De Mare Company put in many pleas attacking the validity of the Welsbach patent, but all of these failed miserably, so that their only point which could be considered worthy of attention was their claim that their plume or fringe was not a fabric such as was referred to in the Welsbach patent. In this case, also, the judge decided against them, as Welsbach specially states in his claim that the exact shape of the mantle shall depend on the nature of the flame it is to be applied to.

The Sunlight Company relied on their patent, granted to Dellwik according to which the fabric in the form of a mantle is treated with a solution of aluminum and zirconium salts, and afterward coated with a solution of chromium salt. In this way after ignition, a mantle is obtained consisting of a structure of alumina and zirconia coated with chromic oxide. No mention is made in the Dellwik patent of any rare earths, and as the use of such, forms an essential point of Welsbach's patents, the Dellwik patent is not an infringement of the Welsbach.

It will be noted from the above judgments that the contention of the Incandescent Gas Light Company that the Welsbach patent covered

the use of mantles made by igniting fabrics impregnated with the salts of any mineral substance that glows quite falls to the ground. It is obvious that if the inventor had made such a claim it would have been invalid, as being an attempt to obtain protection for inventions which were not made at the time. Welsbach wisely confined his patent to such matters as he was sure of, and left it open to anyone else to find other salts and oxides which would effect the same purpose. As Mr. Justice Wills remarked, it is the fate of a patentee who desires to obtain a perfectly valid patent to leave some loophole through which those following in his footsteps and emulating his success may creep in and share the rewards of his genius.

As regards an appeal to a higher court, such a course is at present unlikely in either case; but if research brings new facts to light another case will be tried.

The Present Gold Movement.

The heavy exports of gold from the United States which have been recorded in our financial columns for the past three weeks have a special interest from the fact that they have not been made to London in the ordinary course of exchange, but to Germany on special orders, which are generally understood to be on Russian account. For that reason a little consideration of the condition of Russian finances and the probable occasion of such purchases will not be out of place.

The following statement shows the amount of gold reported by the Bank of Russia by its latest return, which is of date April 16th-28th, comparisons being made with the return of corresponding date last year, and with that for January 1st-13th of the present year, and the amounts given in dollars, the gold ruble being taken at \$0.75:

	1895.		1896.	
	April 16-28.	Jan. 1-13.	Jan. 1-13.	April 16-28.
Gold in Issue Dept.	\$263,107,200	\$337,497,600	\$375,000,000	\$375,000,000
" " Banking Dept.	31,032,000	20,870,400		35,774,400
Total Bank Gold	\$294,139,200	\$358,368,000	\$410,774,400	\$410,774,400
Government Deposit.	150,278,400	112,992,000	70,387,200	70,387,200
Total gold held.	\$445,417,600	\$471,360,000	\$481,161,600	\$481,161,600
Increase over 1895.		25,942,400	35,744,000	35,744,000

The amount reported in the banking department in 1895 included a small quantity of silver, exactly how much is not stated; but in the statements for the current year no silver is included. The decrease shown in the government deposits in the April statement of this year is chiefly due to transfers from that account to the Bank reserve, so that in considering the gain we may take into account the totals only. The amount of notes issued in April of this year was 1,121,280,000 rubles, of which the Bank held 115,450,000, leaving 1,005,830,000 rubles in circulation. Taking the whole issue at its current rate of 48 cents per paper ruble, which has varied but little for years, we find that the total nominal value of the notes was \$538,214,400, and that the gold reserve in the issue department was 69.7 per cent.—a very high proportion, especially in a country like Russia where the circulation is less active than here, and a smaller reserve would be amply sufficient for all the needs of business in the Bank. It must be remembered also that gold has not circulated in Russia, during the present generation, the paper ruble and small subsidiary coin being the only money known to the people. Moreover, such a thing as a run upon the Bank for gold is not possible; no Russian could or would question its credit, and any movement to draw gold would promptly be suppressed. It must be understood also that the Bank of Russia is not a commercial corporation, like our banks, nor even like the great European banks under State control, like the Bank of England or the Bank of France; it is, in fact, a bureau of the Treasury Department which is charged with the management of the credit currency and, to a certain extent, with the handling of the government funds. Its gold reserves are wholly at the disposal of the Empire in any emergency, and the banking department, as distinguished from the issue department, is concerned, not with ordinary deposit and discount business, but chiefly with transactions connected with foreign trade and the regulation of exchanges.

In considering the gold reserve we have to take into account, therefore, not only the nominal reserve which can be, and is, varied from time to time at the will of the Ministry of Finance, but also the government deposits. We find thus that in the year ending with April the total has increased by the amount of \$35,643,400; and that has been more than the amount of gold produced in Russia during the year, which is reported at \$33,900,000. In other words, the whole gold output of the country—which was larger than that of any previous year—went into the Bank reserve. No gold was sent abroad, and none was advanced on account of the Russian guarantee of the Chinese indemnity payments to Japan, all that has been needed for that purpose having been obtained by the Chinese loans placed in Western Europe.

At the present time the Bank of Russia—that is, in effect, the Russian government—holds in reserve the largest hoard of the yellow metal in existence anywhere in the world, and not content with this, it is taking measures to increase its accumulations. The large deposits usually

kept in Berlin and Paris and the smaller one in London have been quietly reduced by drafts from St. Petersburg, and it is believed that considerable purchases on Russian account are being made. As the present condition of the exchanges favors the operation, a part of this gold has been taken from New York, diminishing our treasury reserve in the way which our vicious currency system has made so easy and so familiar to us.

A possible, but only a very partial, explanation suggested for the present demand is the lavish expenditure incident to the coronation ceremonies of the Czar; but the Imperial treasury is in condition to supply all these, and a large part of the payments would naturally be made in paper. Another explanation, more full and satisfactory, if it is accepted, is found in the reports that the Russian treasury is preparing to resume specie payments at home. These have been widely circulated in Europe, but are not, we believe, accepted by the best-informed financiers, though it is entirely in accordance with Russian policy that they should be given out. The reasons for doubting the statement are chiefly that there is no apparent cause for such a change at the present time. The paper currency is generally acceptable to the people; it is fairly stable in value, and a change to specie would probably be more disturbing to the interior business of the Empire than a continuance of the present system. Moreover, the making of the change, the creation of a new metallic circulation and its maintenance under contingencies which are very likely to arise in the not distant future would put a strain on the treasury which its managers are not at all likely to assume.

The probable and rational explanation of the present movement is that the Finance Ministry of the Empire is converting all its available assets into gold in order to be ready on the one hand to take advantage of any new complications in the European situation; and on the other to be prepared for the conflicts which are almost sure to follow the carrying out of the vast schemes for the extension of Russian power in Eastern Asia which are already plainly outlined. The present Czar is young and is believed to be ambitious; he is known to have made an especial study of the Asiatic question, and it is not unlikely that he has determined to signalize his reign by making Russia beyond all question the dominant power in Asia. To attain that object almost certainly involves a struggle with England; and in these times a great gold reserve is the first and most necessary preparation for war.

Whether this be the true explanation or not—it is certainly the most plausible one—the fact remains that Russia is drawing from our Treasury gold reserve as Austria did three years ago; and as every other nation will do on occasion until we adopt some rational system of finance and currency which will once more put our business affairs upon a stable basis and permit a return to prosperity.

NEW PUBLICATIONS.

ROADS AND PAVEMENTS IN FRANCE. By Alfred Perkins Rockwell, New York; John Wiley & Sons. Pages, 107; illustrated. Price, \$1.25.

This is an excellent epitome of that which is found distributed through several French works and government documents not easily obtained. The book gives excellent outlines, valuable to thinking men interested in good roads and their maintenance. The portions treating of road grades, material and systems of construction and maintenance are very valuable. The illustrations are clear and concise. They consist principally in cross-sections of roads and a few of pavements. The system of analysis of the cost of maintaining good roads is well illustrated by tables. The reader at once sees that the subject of maintenance of roads and pavements in constant good repair requires more thought, and, if neglected, incurs greater expense than the first cost of such constructions. It is far cheaper to maintain roads and pavements in constant good order than to neglect them and be compelled to eventually renew the whole. This is as true of a roadway as a railway. It would be financial ruin for a railway company to fail to maintain the rails in constant good order even by slight daily attention. The book confines itself in the matter of pavements of streets to Paris only, whereas its title would indicate that Marseilles, Bordeaux and others should be treated. The author states that he bases his paving statistics of Paris on the "Memoranda accompanying the account of expenses under the appropriation of 1893." The statistics would have been more valuable if other years and other documents had been included, for example, "The Maintenance of Streets," by Allard; "Notes of the Inspector-General," in connection with each annual budget, etc. But much information of value is contained in the latter part of the book concerning the pavements of Paris. The reader at once sees that the price per square yard of pavements is much higher than that paid in the United States. Asphalt, for instance, costs from \$2.84 to \$3.10 per square yard, with 37c. per yard per annum for maintenance, the asphalt used being compressed asphaltic limestone, whereas the asphalt pavements of America, with very few exceptions, are composed of artificial asphaltic sandstone, the cementing material of which is Trinidad or other equivalent asphalt, laid at prices less than those paid in Paris and maintained from 5 to 15 years without additional expense. Wood pavement in Paris, laid upon a concrete foundation, costs from \$2.46 to \$3.46 per square yard, and this without contractors' profits, because Paris does its own wood paving. The wood of the pavements, if renewed every four to seven years, would make an additional expense of about 46c. per square yard per annum. It is well to bear in mind that the streets of Paris are maintained in constant order and to a degree of excellence which warrants the expense, although the time has undoubtedly arrived when the introduction of American methods and machinery in connection with asphalt paving would be of great financial advantage to Paris upon

many streets now paved with wood. The reason why Paris retains a large amount of its wood seems to be that it is at present cheaper to continue to repair the wood than to obtain the large capital necessary to replace the entire wood with other pavement.

ETUDE INDUSTRIELLE DES GITES METALLIFERES. Par George Moreau, Paris; Baudry et Cie., 1894, pp. xiv., 439, 8vo.

The publications of the last ten years furnish emphatic evidence that intelligent interest in mineral resources is rapidly growing. After a considerable interval, not specially marked by literature relating to these subjects, a very notable increase in books on economic geology has taken place. And this is true, not alone of statistical works, issued either by private or by governmental editors, but also of monographs and general text-books. It is a development strongly to be commended, because as regards the general national welfare nothing is to be more earnestly desired than a widely disseminated and intelligent comprehension of each land's mineral wealth, its exploitation and treatment.

The work before us seeks to cover for metalliferous deposits all these three last mentioned topics. Chapter I of 40 pages, deals primarily with the classification of ore deposits. After a few introductory generalities, rocks and geological formations are briefly tabulated, defined and described. For readers outside of France an interesting synopsis is afforded of the scheme of rock classification most in use in that country and the one that is taught in the higher schools of mines. A similar stratigraphical tabulation of geological formations follows, with the European and North American divisions in parallel columns. These preliminaries completed, the classification of ore deposits next receives attention and with a review of the earlier schemes of Von Groddeck, de Lapparent, Phillips, Whitney, Raymond and Posepny, the author leads up to one of his own, whose four principal divisions are the following:

- A. Gites stratifiés (stratified deposits).
- B. Gites éruptifs (eruptive deposits).
- C. Gites à cavité pré existante (deposits in a pre-existing cavity).
- D. Gites de substitution (replacements).

In the subsequent discussion the main features of ore deposits are brought out and illustrated not alone by European but by American cases as well. A section devoted to the general features of deposits, such as strike, dip, thickness, walls, outcrops and to the methods of drawing concludes the chapter.

Chapter II. is devoted to the formation of fractures and cavities. It begins with a discussion of the nature of veins (filons), as contrasted with the general term "deposit" or "gite" earlier used. The causes of fracture in the earth's crust follow, and the usual geological explanations are set forth. Fractures in a single formation, and then those that cross several, and the secondary modification in both these varieties receive mention. Faults having remained up to this point without special treatment are next taken up, and the systems of veins and the formation of cavities.

Chapter III. is devoted to the methods of the genesis of deposits, and especially the filling of the cavities whose origin was discussed in Chapter II. The successive topics are the causes of filling; the methods of deposition and the relations of the rich parts.

Chapter IV. is devoted to ore bodies of sedimentary origin. The generalities are first taken up and then their methods of genesis and their metamorphism.

Chapter V. is a brief review of mineralogy. The general properties of minerals, such as crystalline systems, optical properties, thermal, electrical and magnetic phenomena, cohesion, hardness and density occupy a half dozen pages. A quick resumé of the common minerals of 17 of the more important metals is given in 10 pages, and then the ordinary chemical and blowpipe reactions of the principal elements in 10 more.

Chapter VI. contains the descriptive part of the work proper and in 68 pages the characteristic ore deposits of gold (12 pp.), silver (7 pp.), copper (9 pp.), lead (13 pp.), zinc (6 pp.), iron (13 pp.), tin (6 pp.), and all the less important metals (7 pp.), together with statistics (5 pp.), are covered. The descriptive part is only a little more than one-quarter of the book up to this point, and is extremely brief and sketchy, but it is cosmopolitan in character and especial attention is given to American occurrences. The remainder of the book, pp. 254-436, except for the concluding bibliography, is practically a short handbook of mining and metallurgy. It is evident, therefore, that M. Moreau's purpose has been to establish in the minds of his readers the principal mineralogical and geological features which are of service in the development and exploitation of mines.

Chapter VII. treats first of prospecting, under which head the various indications of ore, the rough means of testing and similar preliminaries are set forth. The succeeding topics are: examination following discovery; determination of the minerals found; sampling; methods of assay, under which lists of apparatus, formulas for assay-mixtures and other details are given; and finally the definite and close examination of the ore body which is supposed now to promise to be a mine.

Chapter VIII. takes up the actual treatment of the ore. Oredressing is the first topic and the mechanical methods of concentration are described at the outset. Then the particular or special processes for beneficiating ores of gold, of silver, of copper, of lead and then of the several minor methods are passed in review. The chapter concludes with general advice regarding the choice of a process. Of course these topics, any one of which demands a book of itself, are very briefly sketched and only the main points are touched upon.

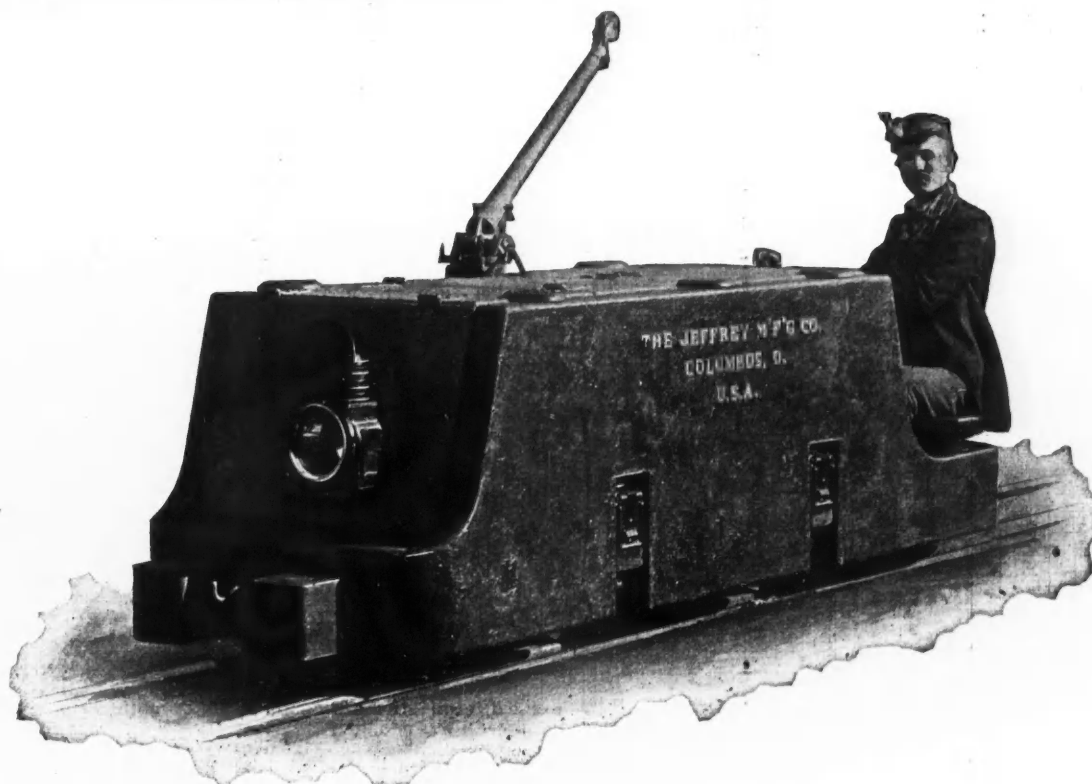
In Chapter IX. the point of view is first that from which the cost of development and of the establishment of a plant is regarded and the various factors entering into this are summed up. The methods of estimating a mine's value next receive attention. M. Moreau has frequent recourse to mathematical formulæ to aid in this and even recommends the differential calculus, napierian logarithms, the asymptotes of hyperbolas and various formidable mathematical devices to engineers to aid them in determining whether an ore body is likely to prove a paying mine or not. All this is, of course, delightfully doctrinaire and probably will create a smile on the faces of our mining men who read it. While we all know very well that this very question is an annoying one, yet its solution lies in systematic and reasonably full sampling, the properly complete information of the engineer in charge regarding local conditions, and above all his good judgment, and no mathematics will supply the lack of any one of these.

portion of the copper. At this stage do not wash either the aluminum or the filter, but simply remove the flask and set the beaker in its place. Heat the mixture in the flask to boiling and see that all the copper is dissolved. Then add about half a gram of potassium chlorate and again boil for a moment. This is to oxidize any arsenic present to arsenic acid and is a very important point. Remove the flask from the lamp and again place it under the funnel and wash the beaker, aluminum and filter with as little hot water as possible. Again boil sufficiently to remove every trace of red fumes. All the copper is now in the flask as nitrate. Add the zinc acetate and proceed from this point precisely as described with the original nitrate of copper solution in the standardization of the hyposulphite, finally calculating the percentage of copper present from the amount of standard hyposulphite required. One point, however, remains to be further explained. According to the equation previously given, half a gram of pure copper requires 2.62 grams of potassium iodide. While direct experiment shows this to be apparently true, yet it is found that with small percentages of copper, the reaction, when only the theoretical amount of potassium iodide is taken, is slow and in fact does not appear to proceed to completion until during the titration, which is thereby unduly prolonged. It is therefore best to use not less than three grams of potassium iodide in any case. An excess does no harm. Silver does not interfere with the method. Lead and bismuth are without effect, except that by forming yellowish iodides they may mask the end-point before adding starch. Lead is practically removed as sulphate at a previous stage. If bismuth is suspected in any appreciable amount, simply add the starch earlier in the titration. Arsenic when oxidized as described has

EIGHTEEN INCH GAUGE ELECTRIC MINING LOCOMOTIVE.

We illustrate herewith one of the Jeffrey 18-in. gauge Standard type of double motor mining locomotives for use in the mines of the United Verde Copper Company, Jerome, Ariz. As will be seen, the locomotive has been designed with a view to making it strong, compact, simple in arrangement, and accessible, with very few parts that can get out of order, thus reducing the liability of delays and shut-downs, which has been the great trouble with locomotives designed in the past.

One of the greatest advantages obtained by using this construction is the interchangeability of parts; every piece almost being in duplicate; or, in other words, there are two locomotives combined in one, each axle being entirely independent of the other, there being no connecting rods, chains or complicated gearing and clutches. As will be seen from the accompanying illustration, this locomotive has the operating mechanism and operator's seat on the end. The frame of this locomotive for the wider gauges is made up of four massive pieces of cast iron, fitted and bolted securely together, having side frames recessed to receive the axle boxes, springs and trolley socket; on the narrower gauges the frame is composed of two pieces recessed in a similar manner. On the heavier locomotives the bumpers are cast solid on the end pieces, while on the smaller locomotives the bumpers are made of oak protected with boiler plate and bolted to the end frames. Drawbars are generally made of wrought iron or cast steel, and made to suit the drawbar or coupling on the car that is to be hauled; on the larger locomotives a spring drawbar is used, taking away a great deal of the shock in starting the loaded trip. The driving wheels and axles are made



EIGHTEEN INCH GAUGE ELECTRIC LOCOMOTIVE.

no influence. The return of the blue tinge in the liquid by long standing after titration is of no significance, but a quick return of the color, which an additional drop or two of the hyposulphite does not permanently destroy, may indicate either an incomplete combination of all the nitric acid with zinc, or a failure to completely boil off the red fumes when dissolving the copper in nitric acid. The assay in such a case is spoiled. This trouble may be avoided by carefully following the directions given and not guessing at strengths or quantities. The amount of zinc acetate recommended is a safe excess. Sodium acetate does not appear to work as satisfactorily.

For the assay of alloys, etc., the necessary modifications of the foregoing scheme are obvious.

The foregoing scheme directs the use of 5 cc. of dilute nitric acid for dissolving the copper previous to titration and prescribes six to seven gram's or about 20 cc. of a saturated solution of zinc acetate as a safe excess of neutralizing agent. It is obvious that if most of the nitric acid be boiled away the amount of zinc salt necessary is greatly reduced. In such a case, however, it is perhaps best, for safety's sake, not to use less than one-half the prescribed quantity. Half the zinc salt may thus be saved at the expense of a little more time. This is the ordinary practice in my own laboratory.

Popocatepetl Railway to the Sulphur Mines.—The survey of the volcano Popocatepetl, Mexico, for the purpose of determining the best location for an aerial cable railway to the summit has just been completed. It has been determined to start the line from the ranch of Tlmacus, and it will be connected with the Inter-oceanic Railroad at the base, so that the business of shipping sulphur can be cheaply accomplished. This new railway will be a great attraction to tourists, who will now be able to make the ascent to the summit, 18,000 ft. above the sea, and also descend to the crater, where the process of extracting sulphur is being carried out.

of the best gray iron with chilled finished rims. The wheels are not keyed to the axles, but are solidly pressed on in the approved manner of large steam locomotives. The axles are made of the best rolled steel and finished all over. The journal boxes are of the standard Master Car Builders' type, and have ample room for packing. The brasses are easily replaced. The brake is an automatically locking screw brake, and is extremely sensitive, only a very slight motion being required to release the pressure. Each locomotive is equipped with four sand boxes, one for each driver, operating in pairs, so that the track is always sanded ahead of the drivers. The motors are of the multipolar, iron-clad type, slow speed. They are hinged directly on each driving axle and supported flexibly to the frame. They are thoroughly waterproof, and all of the parts are protected by the field frames. A cylinder controller is used, similar to that in use on standard street railway equipments, having ample capacity to carry the maximum current required by the locomotive at any time. In the same box with the controlling cylinder the reversing switch cylinder is located, making a very compact and neat arrangement. In connection with this controller a three-pole switch is used for giving two speeds, one of four miles per hour, the other of eight miles per hour, the slow speed being obtained without intervening resistance, thus saving a great waste of power, and enabling the operator to do his switching at a slow speed.

The Jeffrey Manufacturing Company build their locomotives in eight standard sizes, ranging from 10 to 80 H. P., with drawbar pulls of from 500 to 4,000 lbs. Many of these are in use and have proven to be a practical and commercial success.

Life of Railroad Ties in Russia.—Mr. V. Herzenstein, a Russian railway engineer, estimates that the life of creosoted sleepers is as follows: On main lines creosoted pine lasts 15 years, oak 18 years and beech 20 years.

THE NUMBER OF EMPLOYEES IN AUSTRIAN MINES AND SMELTING WORKS IN THE YEAR 1894 AND STATISTICS OF ACCIDENTS.

Written for the Engineering and Mining Journal by R. Holmbacker.

The following table shows the total force employed by the Austrian mines and smelting works in the year 1894:

Reported for the following mines:	Number of persons engaged.			Total force.	Jointly.
	Men employed mostly below ground.	Women employed above ground.	Boys employed below and above ground.		
Collieries (bituminous coal, also anthracite)	46,951	3,476	3,324	53,751	
Collieries (brown coal, also lignite)	41,041	2,134	1,061	44,239	
Iron ore	4,303	43	85	4,431	
River ore	4,687	5	69	4,761	
Lead ore	2,240	581	191	3,068	
Zinc ore	904	348	33	1,285	
Quicksilver ore	1,146	26	48	1,220	
Graphite	936	9	30	1,035	
Copper ore	783	10	22	815	
Other metallic or other minerals	906	27	145	1,078	
Ozokerite	4,855	147	2	5,104	
Naphtha	3,370	31	3	3,304	
Salt (mined)	2,242			2,242	
	114,374	6,940	4,919		126,233
Laborers in smelting and salt works:					
In pig and cast-iron smelting works	5,751	180	203	6,134	
In other metallic smelting and mineral works	1,832	133	50	2,015	
In salt (brine) works	4,589	1,092	2,027	7,618	15,767
	12,172	1,315	2,280		142,000

ACCIDENTS IN MINES IN AUSTRIA IN THE YEAR 1894; THEIR CAUSES AND RESULTS.

In the year 1894 there were in the Austrian mines 1,054 accidents, from which fatal accidents there were 395 men killed (145 more than in the year 1893), and 660 men injured (111 more than in 1893). The ratio of men killed to the number of employed is, per thousand, 3.1; the ratio of men injured to the number of employed per thousand is represented by 5.7. In smelting and brine works there were killed 1 and 14 persons injured out of the number of laborers' force of 15,767 persons.

The number of accidents in mines in the year 1894, in their proportion to the total force engaged and to the ratio of shipment, is represented as follows:

Reported to mines.	Number of fatal accidents (men killed).	Number of men injured.	Ratio of men killed to number of employed, per 1,000.	Ratio of men injured to number of employed, per 1,000.	Ratio of shipment reported to one man killed in the year, in tons.		Total ratio of shipment to one accident in the year, in tons.	
					1894.	1893.	1894.	1893.
Bituminous coal	276	226	5.1	4.2	34,600	167,800	19,100	40,400
Brown coal	33	314	2.1	7.1	186,400	10,800	42,600	38,500
Iron ore	3	33	0.7	7.9	404,900	369,700	36,800	48,200
Salt	1	14	0.5	6.2	39,800	21,400	2,700	6,100
Naphtha and ozokerite	17	27	2.0	3.2	7,000		2,700	
Other metallic ores and minerals	5	46	0.4	3.5	38,900	23,800	3,800	4,300
	395	660	3.1	5.7				

Causes.	Total accidents.		Percentage from both causes.
	Fatal accidents; men killed.	Injured.	
Suffocation caused by explosion of fire-damp	257	17	26.7
Crushed by cages, cars, appliances, connected with hoisting machinery	21	169	18.4
Struck by falling rocks, timbers and other objects	21	132	14.6
By collapse of the roof	28	83	10.7
Falling of cages and buckets; other falls unconnected with hoisting machinery	17	53	6.6
Caught by machinery or carelessness in handling tools	3	43	4.5
By caving, holing (undercutting)	5	32	3.6
By overwinding cages and buckets; suffocation not caused by fire (choke-damp); premature explosion of unexpected charges; unclassified causes	43	131	14.9
Total	395	660	100

In the Hungarian States there is a lack of statistics for the year 1894, wherefore the figures from the year 1890 are given as follows:

In the State.	In all mines (also salt mines).			
	Total force engaged.	Men killed.	Injured.	Minor accidents.
Hungary	28,887	43	107	
Transylvania	15,033	17	50	
Kroatia	794	1	2	
Bauate	9,165	6	49	
Total	53,769	67	208	787

QUANTITATIVE ESTIMATION OF TIN.*

By Cecil J. Brooks.

The following is a brief record of experiments made in the laboratory of Messrs. Stanger & Blount to ascertain the cause of the low results which are often obtained in the determination of tin.

Pure tin being difficult to procure, a good sample of the commercial material was used, which gave the following composition on analysis:

Tin	99.25%
Lead	0.36%
Copper	0.10%
Iron	0.16%

Fifty grams were treated with a small quantity of hydro-chloric acid, to avoid the formation of stannic compounds and the solution of impurities; this was kept as a stock solution of approximately known strength; a dilute solution was prepared from this, and was standardized by evaporating 50 cu. cm. with excess of sulphuric acid, oxidizing with nitric acid. Evaporating again with sulphuric acid, and igniting in a gas muffle until the weight of the residue (stannic oxide) was constant, giving a total weight of 0.4408 g., i. e., 0.00901 g. of stannic oxide per cu. cm.

Experiment I.—50 cu. cm. of the solution were acidulated with hydro-chloric acid, and a large volume of hydro-sulphuric acid added; the gas was then passed for some time; finally the solution was heated, filtered, and the precipitate of stannous sulphide washed until the washings were no longer acid, dried, and ignited slowly. As the filter paper burned, the precipitate broke up with some violence, and after ignition in the muffle gave 0.4467 g. stannic oxide, the loss being therefore 0.0041 g. (of stannic oxide).

Experiment II.—50 cu. cm. were taken, about 10 cu. cm. of nitric acid (sp. gr. 1.42) added, and the mixture was boiled and precipitated as in Experiment I. It was found that no oxidation had taken place; after the precipitate weighed 0.4451 g., the loss being in this case 0.0057 g.

As it was seen from this that oxidation with nitric acid did not take place readily, some of the solution was boiled with acid of different strengths, and it was found that oxidation depended on the dilution rather than on the quantity of acid present.

1. A solution measuring 105 cu. cm., and containing 0.035 g. of tin, was boiled with 1 cu. cm. of nitric acid (sp. gr. 1.42) and gave no indication of oxidation when precipitated with hydro-sulphuric acid, the bulk of the precipitate being stannous sulphide.

2. A solution of 55 cu. cm., and containing 0.035 g. of tin, when boiled with 1 cu. cm. nitric acid, gave no indication of oxidation.

3. A solution of 25 cu. cm., and containing 0.035 g. of tin, when boiled with 1 cu. cm. nitric acid, showed partial though slight oxidation.

Bromine was found to be a more effective oxidizing agent. Potassium chlorate and hydrochloric acid also acted readily.

My attention was now directed to the possible volatilization of stannic sulphide on ignition. A specimen was therefore prepared. It was noticed that the thin cakes of stannic sulphide left drying on the filter, broke up violently when gently heated; in fact, the warmth of the hand was sufficient to cause them to decrepitate.

The sulphide was finally powdered, and heated in a porcelain tube attached to a long glass tube, so that any volatile products (other than sulphur dioxide) might be caught. Oxidation was performed by means of a slow stream of air; the temperature ranged from well below redness to about the melting point of gold. At the close of the experiment it was found that 5.5% of stannic oxide had been volatilized.

It is clear that the ease with which stannic and stannous sulphides are volatilized on roasting is the cause of the difficulty often experienced in the determination of tin, and to overcome these difficulties the following process was adopted:

Fifty cu. cm. were acidulated and oxidized with bromine, while hot hydro-sulphuric acid was added and the gas passed. The solution was filtered and the precipitate washed, dissolved off the filter with hot ammonium sulphide; the solution evaporated in a weighed basin to a convenient bulk, oxidized with nitric acid, and the residue (stannic oxide) dried, ignited and weighed.

First determination gave 0.4495 g. stannic oxide.

Second " " 0.4519 " " "

These numbers show a fair concordance with the weight taken as a standard, 0.4508 g. of stannic oxide. As a final test 0.25 g. of the same tin was taken and treated as above, and after the subtraction of impurities present in the stannic oxide (lead being calculated as sulphate and copper as oxide) the following result was obtained:

Tin found, 0.2490; calculated, 0.2489.

The method, though lengthy, appears to be accurate.

Hot-Air Stoves at British Iron Furnaces.—Cowper stoves in use, 318 and three building; Whitwell stoves in use, 120 and three building; Ford and Moncur stoves in use, 142 and 13 building; Massicks and Croke stoves in use 64 and two building. It appears that where Cowper stoves are used exclusively, 241 are provided for 128 furnaces, or an average of 1.88 per furnace, or in more recent cases 1.4 per furnace. With Whitwell's the figures are 91 stoves for 31 furnaces, or 2.9 per furnace, the same ratio obtaining with the Massicks and Croke stoves—35 stoves for 12 furnaces. In eight cases where Ford and Moncur stoves are used exclusively, 48 serve 45 furnaces, an average of 1.08 per furnace.

Cost of Electric Traction in France.—M. Badois gives 2.75 lbs. of coal as the consumption per horse power hour, and arrives at 12.98 lbs. of coal per car mile. At Marseilles, during the first two weeks of operation of the trolley system, 150,348 lbs. of coal were consumed to run 19,970 car miles, and during the second two weeks 150,975 lbs. for 18,983 car miles. The average is 7.73 lbs., which, however, includes the coal used in connection with the lighting of the cars and the power station.

*Chemical News.

THE MOROSCO FUSION PROCESS.

Very few people are aware that in the little mining town of Amador City there has been erected within the past year a plant for the working of base ore which may change the mining industry of the world, so far as this class of ore is concerned. The treatment is known as the Morosco Fusion Process, and the patents covering same are owned by the Morosco, Shields & Bishop Fusion Company, of San Francisco. The subjection of calcined ore to a molten lead bath and extraction of the precious metals by so doing is not an idea of recent date. To devise practical machinery for feeding the ore continuously into the lead, to then handle the same in its passage through the molten metal, so as to bring every particle of ore in contact with the lead for a sufficient length of time, to insure perfect extraction of the precious metals, to discharge the tailings from the apparatus without any loss of lead, and to combine all these points successfully has required much thought, labor and capital.

Eminent authorities have conceded that such a process would be a success and in certain branches revolutionize ore treatment, providing the mechanical effects could be so constructed as to insure steady introduction and perfect segregation of the ore while in the lead, automatically discharging same, all these features to combine regularity and durability.

Last June the erection of a plant was commenced in Amador County at the Bunker Hill Mill, and operations were at once begun to demonstrate and work the process on a practical scale. This process now completed, is offered to the mining public for their investigation. The numberless failures of the past will cause many men to doubt if a success is really at hand. The photograph here shown will give an adequate in-

about 44% of lead, which is all recovered on the concentrators, re-melted and refined and is used again in the bath.

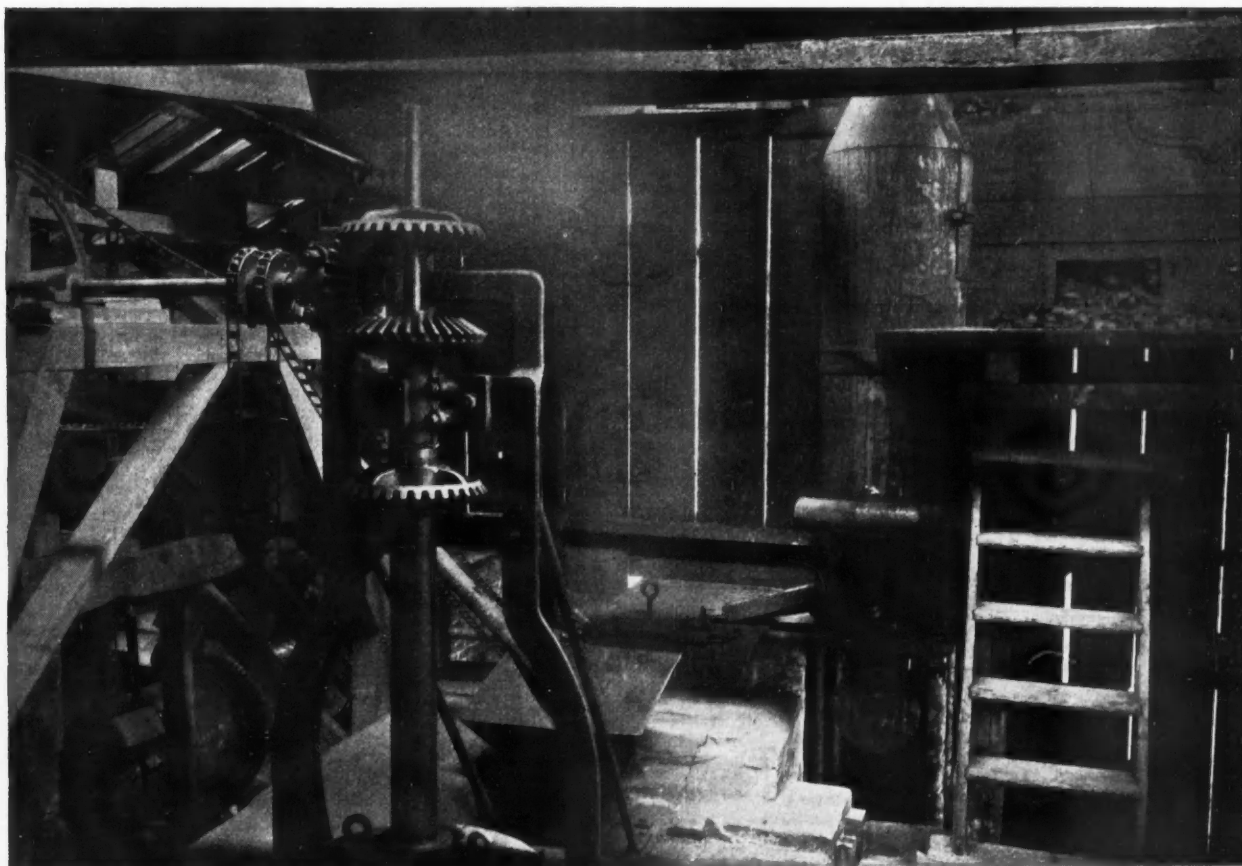
The bath furnace takes one-quarter of a cord of wood in 24 hours to keep a proper heat. Twelve horse-power is required for running machinery.

Providing the capacity of the present machine is only 10 tons per day; the cost of working per ton is \$2.02, on chlorination tailings that have lain idle for want of some means to extract their remaining value.

Gold-bearing sulphurets and base ores can be worked by the Morosco Fusion process for from \$3 to \$4 per ton and yield over 90% extraction.

A LARGE COAL-SCREENING AND WASHING PLANT.

The Essener Bergwerks Verein König Wilhelm (the Essen Mining Association, K. W.), we learn from the *Colliery Guardian*, will shortly have an average output of 2,600 tons of pit coal per day, of which 1,000 tons will be raised from the Neu Coln pit and 1,600 tons from the Christian Levin pit. The pits are connected by means of an iron viaduct, 1.6 kg. (about one mile) long, and rope haulage in order that the screenings under 75 mm. (3 in.) may be conveyed from the screenings at Christian Levin to the washery at Neu Coln. This rope haulage is designed to haul about 100 tons of coal per hour, and is placed on the whole length of the viaduct at a height of 7.350 m. (25 ft. 7 in.) above the top of the railway rails. The screening plant at the Christian Levin pit is designed for an output of 2,000 tons in 10 hours. The screening plant at Neu Coln is for the output of 1,000 tons at this pit, but the washery is designed for the output of the two pits taken together, or about 2,000 tons of screenings per 10 hours.



BASE ORE REDUCTION PLANT AT BUNKER HILL MINE, AMADOR COUNTY, CALIFORNIA.

sight into the works, showing a plant capable of treating between 10 and 20 tons per day, which has been running successfully on ore since April 3d, 1896.

The treatment of ore in detail is briefly as follows: The ore being first reduced to 30 or 40 mesh, according to its character, is then given a dead roast to free it from all volatile bases, such as sulphur, arsenic, antimony, etc., which if allowed to remain would prevent the precious metals contained in the ore and lead coming together. The roasted ore is at once fed to the bath machine while still at a high heat, as the introduced ore must necessarily be considerably above the melting point of lead (640 F.) in order that there may be no chilling effect upon the bath and thereby reduce the amalgamating heat.

The roasted ore is fed in a steady stream automatically to the bottom of the bath well, which is a very heavy iron casting, 30 in. in diameter and 6 ft. deep. The ore on reaching the bottom of this casting is freed, and at once attempts to rise by its own gravity through the bath of molten lead of which there is over five tons. In this chamber are circular perforated plates with reversed stir-arms between, and the ore is caught by the first stirrers and segregated passing through the first plate and on to the second set of stirrers, continuing this operation five times until it arrives on the surface of the lead, where it is discharged automatically by a rapidly revolving disk; then to a trap box of running water which immediately chills the ore and thence passes on to the concentrator.

After the ore has passed through the bath, it carries no gold or silver, as the precious metals have become fused with the lead and left behind in the well, while the ore is discharged into the water-box, carrying with it

The plant at the Neu Coln Pit has been working since 1893, and produces pit coal in two qualities, ordinary picked and best mixed, lump coals over 75 mm., nuts Nos. I., II., III., IV. and V. of the sizes 75-45, 45-30, 30-18, 18-10 and 10-6 mm., mixed nuts, and coking coal with about 6% of ash. At present unwashed coal dust with about 9-12% of ash is mixed with the washed coal dust, but later on, when the projected extension of the sidings is completed, all the coal dust will be washed, and the ash in the coking coal reduced to about 4%.

The coals which are brought from the Christian Levin pit to the washery, by means of rope haulage are for the present to be tipped, together with the coal from the Neu Coln pit, by means of the tipplers, on to the movable bar and roller screens. It is intended to add two further tipplers in order to tip the coal in question direct into the pits of the main bucket elevators. The tipplers are power-driven and fitted with anti-breakage aprons to allow the coals to slide as gently as possible onto the screens. The roller screens with 75 mm. holes and the bar screens with 50 mm. holes, are Humboldt's patent, and specially arranged for gentle treatment of the coal, as part of the output of the Neu Coln pit is very soft coal. One tippler is reserved for certain pit coal from Neu Coln, which is not screened, but slides direct on to the picking band, and is then loaded in the siding, by means of a Humboldt loading shoot, with creeper chain. Besides being picked this coal is improved by the addition of lump coal on the picking band in certain fixed proportions. From the screens, the lump coals slide onto the picking bands and are loaded by means of shoots as above described in wagons on the sidings.

The screenings from the flat screens are collected in the elevator pits,

and lifted by means of the bucket elevators to the patent multiple spiral drum screens in the washery. These consist of five concentric shells, which classify the coal into the five sizes of nuts, I. to V., and fine coal or dross under 6 mm., as already mentioned.

The five different sizes of nuts slide through troughs to their respective nut washers and thence to the draining screens and drums over the respective bunkers. The drum, with bunker underneath, is used for various definite mixtures of nuts, which can be made automatically by suitable arrangements before reaching the bunker. The nuts Nos. I. to IV. are loaded from their bunkers by falling onto the band conveyor, P, which conveys them to the swinging screen, Humboldt-Klein's patent. This screen has fine perforations, and on it the coal is sprayed and freed from all particles of coal dust; it is then loaded in the siding. If required the nuts can be loaded direct from the bunkers through slides in the siding.

The dross under 6 mm. from the drum screens slides partly into the eight fine-coal washers with feldspar beds, and part is conveyed by means of the scraper conveyor or creeper to the bucket elevator, which lifts it to the drum screen, with 2½ mm. perforations. That which is rejected by this screen goes to the fine-coal washer, and after washing joins the washed and sludge-free product of the above-mentioned eight fine washers, to be drained on the Humboldt-Klein swinging screen. The drained product then falls onto the scraper conveyors, and is lifted, together with the fine coal drawn off from the 10 large fine coal drying-tanks, by means of the bucket elevator, to the spiral conveyors, which feed the disintegrators. The screenings from the drum screen are mixed with the washed fine coal in the spiral conveyors, which feed the mixture into the disintegrators, where the mixture is completed, and at the same time all the larger grains are pulverized. The product of the disintegrators, the coking coal, falls onto the scraper conveyors, and is distributed as required among the coking coal bunkers. If required, the dry coal dust from the screen can be conveyed direct into the two bunkers above the siding, from which it can be loaded in the railway wagons.

The overflow water from the drying tanks is collected in the settling tanks, here the fine sludge settles and is lifted by means of the pump to the perforated-bucket elevator, and delivered onto the scraper conveyors. The clarified washing water is drawn off from the tanks by means of the centrifugal pumps, and returned to the washers and other apparatus, thus remaining constantly in circulation.

From the coking-coal bunkers the coal can be let off into small hopper wagons and then trammed to the 180 coking ovens, to be built subsequently, or it can be let fall direct into the railway trucks standing in the sidings underneath.

The dirt (shale and pyrites) from the nut washers is delivered under water, and falls through pipes to the boot of the perforated-bucket elevator, which lifts it to the shale bunker. The hutchwork (shale collected in the hutches) from all the nut washers and the shale from all the fine washers is conveyed by means of the spiral conveyors to the bucket elevator, which lifts it to the fine washer where the dirt is rewashed. The dirt from this machine is conveyed by the spiral conveyor to the elevator, and lifted, together with the dirt from the nut washers, to the bunker. From this bunker the dirt is let off into light tip wagons underneath and trammed over a bridge to the steam lift, which elevates them to the height of the dirt heap, and is connected to the latter by means of the bridge.

The screening plant is driven by the 40-H. P. engine, with Rider expansion slide-valve gear, and the washery is driven by the engine, with Humboldt automatic expansion trip-valve gear, indicating about 300 H. P., with 1½ admission and 6 atmospheres (about 90 lb.) steam pressure.

The whole of the machinery at the Neu Coln and Christian Levin pits, as described above, including the iron buildings, roofs, bridges, viaduct, constructional ironwork and rope haulage, was supplied by the Humboldt Engineering Works Company, of Kalk, near Cologne.

Tennessee Centennial and International Exposition.—We have been officially informed that this Exposition will be opened on May 1st, 1897, and continue for six months, closing November 1st, 1897. Centennial Park, comprising some 200 acres, two miles west of the State Capital, will be the site upon which the edifices of the Exposition will be constructed. The Tennessee Centennial inaugural ceremonies will take place on June 1st, 1896, lasting two days: The officers of the Centennial are as follows: John W. Thomas, president; Van L. Kirkman, W. A. Henderson and John Overton, Jr., vice-presidents; E. C. Lewis, director general; W. F. Foster, director of works; A. W. Willis, commissioner general; Frank Goodman, auditor; W. P. Tanner, treasurer; S. A. Champion, chief counsel; S. J. Keith, chairman financial committee; W. H. Jackson, J. H. Fall, John J. McCann, B. F. Wilson, H. W. Buttorff, E. E. Barthell, J. W. Thomas, Jr.; Samuel M. Murphy, F. H. Baskette, J. H. McDowell, Horace H. Lurton, A. H. Robinson, W. L. Dudley, E. W. Cole, Tully Brown, M. J. Dalton, Horace E. Palmer, J. W. Baker, J. Van Derventer, J. C. Neely, Luke E. Wright, executive committee; Leland Rankin, chief bureau of promotion and publicity. The Administration Building has been finished, and the agriculture and other buildings are now under way. The arrangement of all exhibits has been placed in the hands of departments, each headed by a chief and a committee of gentlemen who are expert in their respective lines, to be known as follows: Fine Arts; Architecture and History; Commerce and Liberal Arts; Agriculture, Horticulture and Farm Implements; Transportation; Electricity; Machinery; Geology; Minerals and Mining; Forestry and Forest Products; Live Stock, Pet Animals and Poultry; Military; Education; Hygiene, Medicine and Sanitary Appliances; Negro; Public Comfort. We understand that no charge will be made for a reasonable amount of space for exhibits in any of the buildings, but each exhibit offered will be subject, for acceptance or rejection, to the Committee on Classification, with the approval of the Director-General. Exhibit and concession application blanks will be furnished on request, by the Director-General, Mr. E. C. Lewis, Nashville, Tenn.

New Transatlantic Service.—The Dominion Government has given notice of a resolution to pay a subsidy of \$50,000 per annum for five years, for a direct fortnightly steamship service between Canada and France and Belgium.

MINERAL RESOURCES OF THE JUDITH MOUNTAINS, MONTANA.

Written for the Engineering and Mining Journal by Walter Harvey Weed.

Between the Yellowstone and Missouri rivers the arid expanse of the plains of central Montana is broken by the verdure-clad slopes of the Judith Mountains. They form a short, isolated chain some 18 miles in length and 5 or 6 miles wide, which runs in a northeast and southwest direction. The highest summit is 6,886 ft. high and about 2,500 ft. above the plains. The peaks are neither rugged nor imposing, but the scenery is often attractive and picturesque. The mountain streams are small and water is not abundant for mining, the greater part of the annual precipitation passing underground and emerging in large springs about the mountain flanks. Lewistown, the county seat, is situated at the west end of the mountains, and Maiden is a mining settlement in the central part of the group; the old military post of Fort Maginnis on the south side of the range is now abandoned. The accompanying view shows the post and the character of the southern slopes of the mountains, near the mining town of Gilt Edge. The region is readily reached by stage lines running daily from Great Falls and from Fort Benton, cities on the line of the Great Northern Railway.

The Judith Mountains are unsurveyed, and the mineralized areas are divided into the Warm Springs and Cone Butte districts. The former contains all the mines that have thus far been producers. The latter embraces numerous claims of more recent discovery and development. The mines of the region which have thus far been productive are, first, the Spotted Horse and the claims owned by the company working this mine; the Maginnis group, embracing several claims that have yielded considerable in the past; the Florence, which has produced some \$70,000; the Alpine, which has yielded over \$100,000; the Montana, whose output is estimated at \$125,000; and the Gilt Edge, whose output is considerable, but upon which no reliable estimates can be given.

The mines of the region show ore bodies that promise a bright future, but the present remoteness of the locality—about a hundred miles from a railroad—makes the working of low-grade ores impossible, and the district is comparatively quiet at present. Notwithstanding these disadvantages the region has been a considerable producer in the past, the Spotted Horse mine alone having yielded over \$500,000, according to conservative estimates. I know of no other district of the State where there is so large an amount of ore already developed that is practically lying idle for want of proper treatment.

Geology.—The mountains are formed of sedimentary rocks tilted and folded about cores of igneous rock—syenite porphyry—which occur in masses.

The outer slopes of the mountains show the sandstones and shales of the plains upturned against the mountain flanks. The mountains consist largely of the heavily-bedded white limestones of carboniferous age with the more thinly-bedded rocks of earlier epochs, upturned and altered by the great intrusive masses of igneous rock, which form all the higher central summits of the range. In the vicinity of Maiden, a canoe-shaped fold of the sandstone series brings these rocks and the associated black shales into the heart of the mountains and in contact with the syenite-porphry mass of the Spotted Horse Mine.

Intrusive sheets of porphyry offshoots from the main cores of igneous rock occur in the limestones and are often connected with the occurrence of the ore bodies.

The mountain flanks seen from a distance show conspicuous white scollops of limestone, which are found to be carboniferous beds dipping at steep angles. This simplicity of structure is of course complicated by the coalescing of the different uplifts, producing within the mountain region considerable variation and making the geology less simple in detail than it would appear.

About the mountain flanks the cretaceous sandstones and shales contain a seam of coal that is very generally workable and has been utilized at the Gilt Edge Mine for the boilers of the milling plant.

Near the contact of the syenite-porphry with the altered limestones there is a green phonolite, which is quite similar to that noticed in the Little Rocky Mountains. In the east end of the range at Cone Butte a dike of green phonolite was also noticed, so that we have in the Judith Mountains another center of igneous activity in which the rocks are phonolitic in character. There was, however, no evidence observed which would indicate that the mountains were ever the site of an active volcano, nor was any volcanic throat observed. The rocks are wholly intrusive, and no lava flows nor fragmentary volcanic rocks were seen.

The ore bodies of the region are confined to the contact between the intrusive bodies of igneous rock or the rocks immediately adjacent to the contact. In the best-known mines, those of the Spotted Horse group, the ore body occurs in the brecciated limestone near the contact with the syenite porphyry. In the Maginnis mines a similar geological condition prevails. In the Gilt Edge mines the ore body occurs at the contact of an intrusive sheet of porphyry. Elsewhere a few leads have been located in the porphyry itself.

The ores consist of limestones, generally coarsely crystalline, more or less brecciated, and sometimes impure and clayey, carrying fluorite, which is generally purple in color. The gold occurs free and as telluride. The free gold where visible is rusty and as found in the oxidized zone, indicating its probable derivation from the telluride. Quartz is a very unusual constituent. The characteristic mineral is the purple fluorite, which, with calcite lining cavities, are the only gangue minerals observed. Silver is sometimes found in the mines of the district.

The ores carry free gold in the oxidized zone, changing to tellurides in depth. The occurrence of the telluride ores causes great difficulty in treatment, and is the reason why the district has not been more successfully developed in the past. The cyanide process has been used with but indifferent success, and the future of the region depends upon the development of some satisfactory mode of treatment, and not upon the actual finding of any ore bodies.

Spotted Horse Mine.—This mine, which was the first located in the region, was discovered in 1880, and its rich ores caused an influx of miners to this, then remote, locality. The mine is situated on the south slope near the crest of the divide of the range. The ore body is very irregular and occurs in extensive chambers and not in well defined ore shoots. The pay ore seems to be confined largely to the limestones which

are brecciated, often coarsely crystallized or partially decomposed into soft clayey material. As is quite commonly the case about the margin of large intrusive bodies of igneous rock, the limestones about the Spotted Horse are largely altered by local metamorphism. The ore occurs in connection with fluorite, and in the richest ore bodies discovered free gold is seen in quite large masses, imbedded in irregularly shaped masses of fluorite, which appear to have replaced portions of the limestone breccia. The workings are extremely irregular and have in the past been pursued without system or method. The Spotted Horse ore body consists largely of brecciated fragments of the gray limestone, wet clayey material, calcite and fluorite. The free gold occurs diffused throughout the ore, but is only visible in the massive fluorite, occurring in angular masses that suggest the replacement of limestone fragments.

has been done for the past two years, the mines of this region have been idle except while the assessment work has been done.

The Gilt Edge properties include the Ammon group of mines. They are situated near the base of the southern slopes of the mountains on a headwater branch of Ford Creek. The town of Gilt Edge lies a mile south of the mines, and the milling plant between the two. The general appearance of the mountains is shown in the illustration.

At the Gilt Edge mine the ore body occurs near the contact of an intrusive sheet of porphyry within the upper part of the carboniferous limestone, which is here seen to be overlain by the soft limestones and shales carrying Jurassic fossils. The ore is a decomposed, ferruginous, argillaceous material, with leached porphyry, and includes some solid undecomposed limestone. The ore body varies from a few feet to 40 ft. in



MAIDEN, MONT.



SPOTTED HORSE, MONT.

The gold occurs however in fibrous plate and rusty masses that sometimes project from the fluorite into the calcite. The brief examination of the ore body suggests impregnation and replacement, perhaps filling of interstitial cavities, due to chemical alteration and disturbance. In the Gilt Edge mine the ore merges into the country rock, showing that solution and replacement have enlarged to openings. The richest ore comes from a comparatively short distance below the surface, and in 1894 the large body of very rich, free-milling ore was being extracted by an open quarry. The adjacent claim of the Kentucky Favorite has a considerable portion of the steely gray telluride of gold, which is, however, present in very small crystals.

The Maginnis group includes a number of claims, but the mill has been closed down for a couple of years, and in fact with the exception of the Spotted Horse and the Gilt Edge mines, upon which more or less work

thickness and less along the contact between a dark drab colored limestone, showing but little local metamorphism, and an intrusive sheet of feldspar-porphry that is 60 to 75 ft. thick. The local metamorphism of the limestones about the mines appears to be due to the proximity of a larger body of igneous rock and not to the intrusive sheet alone. The limestone beneath the porphyry is cracked, checked and fissured with seams of calcite, and even this dense and apparently unaltered limestone carries gold. In this case also the ore is associated with fluorite, which is, however, seldom of the purple color which is so often characteristic of this mineral. The main mass of the ore body appears to be a shaly argillaceous limestone, which is generally decomposed to clay. It apparently represents a horizon of fissile rock through which the porphyry sheet has been intruded. At the contact the porphyry is much decomposed, and about six inches of it is ore-bearing. This decomposed rock and the bar-

ren-looking limestone both carry from \$6 to \$8 in gold, which with the newly developed improvements in the cyanide process can be worked with a profit even in this remote locality. The general appearance of the ore body is, however, so unlikely looking that frequent assays of the face of the drift are necessary to avoid mining waste rock. In general, however, it may be said that wherever the limestone is checked and fissured it carries gold in an extremely finely disseminated form.

The Gilt Edge mine workings embrace several claims, collectively known as the Ammon mines. The porphyry and the inclosing limestones dip at 25° to 30° away from the mountains. The workings are advantageously situated for easy handling of the ore, and though the latter is of low grade and will perhaps average about \$10, yet the cost of mining and of transportation to the mill will not exceed \$1.50, and the cost of milling can be safely estimated at \$1.25 per ton. At the time of my visit the rock was treated by heap roasting and was then run through a small rock crusher, the product passed through a Chilean mill and the pulverized material elevated and transported by cars to the leaching tanks, where the cyanide solution was poured upon it. The difficulty of treatment is two-fold, consisting first in the length of time necessary for the extraction of the auriferous contents, and, secondly, the stoppage of percolation by the slimy nature of the material. This, however, is a difficulty which an expert metallurgist could by persistent experiment undoubtedly overcome.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

ASSUMPTION OF RISK BY COAL MINER.—By a recent decision of the Supreme Court it is ruled that the occupation of coal mining, where the employee must enter the earth, shafts and tunnels, is one of unusual peril, and those who engage in it assume great risks. The nature of the employment is so very hazardous that those who engage in it must know that it is attended with risks against which human foresight and skill cannot guard. One of the dangers attendant upon mining is that from falling earth, stone, slate and coal. These dangers are greatest, perhaps, in the rooms where the miner works, while the tunnels or entry through which he may have to pass to and from his work can be more or less guarded and protected. It may be safe to state, however, as a general proposition, that under the usual and ordinary contracts of employment between a master and servant, the master undertakes to use reasonable care to see that his machinery is in good condition and repair, and that the place where the servant is to work is free from dangers other than those which are naturally incident upon the work to be performed. If the place furnished by the master appears to the servant to be free from any dangers except those which are naturally incident to the work, the servant, unless he sees that it is not so, has a right to assume that the master has performed his duty, and that the place is as it appears. And, when it is said that the servant assumes the risk of dangers of which he has knowledge, it is not meant that he assumes no risks except from dangers of which he has actual knowledge, or which are patent, for he does assume the risk of latent as well as patent dangers, which are a natural incident to the service, and which it is not the duty of the master to guard against; that is, dangers, whether visible or invisible, known or unknown, at the time of employment, if they are such as naturally arise from the nature of the work to be performed, he assumes. It is for this reason that he is required to exercise reasonable care to ascertain and know of dangers which may exist or even arise suddenly and confront him during his service. Unless the servant, by his contract of employment, agrees to, or the nature of the services to be rendered requires that he inspect the place where he has to work for hidden or latent defects which are simply the result of the master's inattention or negligence, he is not bound to do so. The duty of inspection to ascertain and guard against dangers rests upon the master. But, as to dangers which are naturally incident to the service, the servant is bound to acquaint himself, even to the extent, if necessary to do so, of a minute and thorough inspection. Hence, those dangers which an experienced miner knows must and do threaten him at all times are an incident to the service, and are assumed by him.—Linton Coal and Mining Company v. Persons (43 Northeastern Reporter, 652), Supreme Court of Indiana.

German-Japanese Treaty.—It is reported that Japan has granted material reductions in duties upon manufactured articles imported from Germany, while Germany accords Japan the treatment of the "most favored nations." It is stipulated, it is said, that the commercial part of the treaty may be changed in 1904, when the treaties with Austria and Russia terminate. A convention is also said to have been made in regard to patents, trade marks and on the subject of consular jurisdiction, to go into effect in 1899.

The Siberian Railway.—From Tscheljabinsk a distance of about 1,280 miles is now being used for traffic and the favorable effect of the railway upon industry and commerce is already perceptible. The towns along the line increase in size and number of inhabitants, and the imports already comprise articles which were previously unknown. In the principal streets of Tomsk electric light has been, or is just about to be, adopted, and the journey from Moscow to Tomsk can now be compassed in eight days. The railway department has hired a large number of workmen in Finland, who will be employed at the works on the Siberian Railway.—*Engineering.*

Production of Silver in Norway.—The Kongsberg silver works in Norway have for the last working year yielded 4,859 kg. of silver, and the balance-sheet shows a loss of 9900 kroner, or £550. The expenses, however, comprise over £3000 applied to extensions, besides other expenses of an ordinary nature. The output for the current year is also estimated at some 400 kg. more than during the previous year. Electric boring has been introduced experimentally with two machines from Messrs. Siemens & Halske, and this is expected to reduce the ore-breaking expenses 20 per cent.

Railroading in China.—An imperial edict has been issued by the Emperor of China which gives a concession to a Mr. Wong, a high Chinese official, to build a railroad between Hong Kong and Peking. One condition imposed in this concession is a time limit, in which the railroad must be completed. He must also raise \$20,000,000 within a certain time.

It is not likely that the contracts for equipping the road with rolling stock will be given to American manufacturers, for it is asserted that this country does not care for the trade. European builders will in all likelihood receive the contracts. Germany will be a bidder.

Iron Production in Germany.—According to the report of *Stahl und Eisen* the production of the German blast furnaces for the month of March was 551,157 metric tons of pig iron, showing an increase of 70,013 tons over March, 1895. The product this year was divided as follows: Forge iron, 159,002 tons; foundry iron, 64,677 tons; Bessemer pig, 46,013 tons; Thomas pig, 281,465 tons. It will be noticed that the Thomas pig, that is iron intended for conversion into steel by the Thomas-Gilchrist process, was more than 50% of the entire production. For the three months ending with March 31st the output was 1,560,355 tons, showing an increase of 154,932 tons over the corresponding period last year.

Mineral Imports and Exports of Spain.—For the three months ending March 31st the *Revista Minera* reports the fuel imports of Spain at 388,208 metric tons of coal and 46,689 tons of coke. Coal showed a small decrease and coke an increase. Imports of iron included 1,810 tons of pig iron, 2,683 tons of wrought iron, 4,878 tons of steel and 640 tons of tin plate. Exports of minerals for the three months were as follows, in metric tons:

	1895.	1896.
Iron ore	1,038,352	1,543,967
Copper ore	108,615	141,601
Zinc ore	6,447	7,946
Lead ore	2,327	2,217
Salt	44,458	71,492

Exports of metals for the quarter included 3,246 tons of pig iron, 5,991 tons of copper and 12,889 tons of lead.

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 MAY 12TH, 1896.

- 559,812. **SUBAQUEOUS ROCK-BREAKING CHISEL.** Peter S. Ross, Jersey City, N. J. Filed January 21st, 1896. Combination of a pounding weight or chisel falling by gravity and having a recess in its top, a rubber cushion seated on its upper side in the recess and adapted for engagement at its lower end with a lifting-cord, and a buffer between the weight or chisel and the lifting-cord and arranged to receive the impact of the lifting-cord and to protect the cord from the recoil of the weight or chisel.
- 559,818. **ROCK DRILL.** George B. Seddon, New York, N. Y. Filed June 8th, 1891. Renewed March 7th, 1896. Combination with a longitudinally sectional cylindrical bushing comprising an upper portion, to seat to the drill cylinder, internally recessed throughout its extent, and a lower portion bored to fit throughout its extent to the piston rod, of a cylindrical slit sleeve fitting to and inclosing only the upper recessed portion of the sectional bushing, and provided with external perforated lugs on opposite edges of its slit, with clamping bolts therein, and also with peripheral perforated lugs on its opposite sides; whereby while the sleeve serves to hold the sectional bushing in position upon the drill cylinder, it will bind the sections of the bushing at the portion thereof only which is internally recessed, and thus press a packing in the recess in the upper portion to the piston rod throughout the extent of the upper portion of the bushing, leaving the lower portion of the sectional bushing free beyond the sleeve to support and give bearing to the piston rod in its play therein, without excessive friction between the rod and lower portion of the bushing.
- 559,846. **APPARATUS FOR MANUFACTURING ACETYLENE GAS.** George J. Gray and William F. Hitchcock, Rochester, N. Y. Filed September 5th, 1895. Combination with a gasometer composed of a main water tank, an inverted gas tank, and an auxiliary water tank arranged with an automatically operating supply and discharge as described, of an air cylinder operated as a pump simultaneously with the rise and fall of the gas holder.
- 559,852. **APPARATUS FOR ELEVATING, TRANSPORTING AND DISCHARGING COAL.** Ole Johnson, Milwaukee, Wis. Filed August 24th, 1895. Combination with a plurality of sets of towers, a carrier-supporting cable stretched on and between the towers of each set, a carrier for and arranged to travel on each cable, a revoluble drum in a tower of each set of towers, an endless shifting rope for and secured to each carrier and winding on the corresponding drum, the rope being adapted to move the carrier in opposite directions on the cable, two shafts in one of the towers of each set of towers, an endless belt from a source of power supply running in one direction on one of the shafts in a tower of each set of towers and running in the reverse direction on the other of the shafts in a tower of each set of towers, and means for putting the drum into action by connecting it operatively with one or the other of the shafts in one or more of the drum-supporting towers of each set of towers.
- 559,935. **PROCESS OF SMELTING LEAD ORE.** John David and Carl Le Doux, London, England, Assignors to Henry Ernest Fry, same place. Filed October 11th, 1895. Process of smelting lead ores, with a flux prepared with sulphate of soda and iron oxide.
- 559,980. **ROCK CRUSHING AND GRINDING APPARATUS.** James H. Kinkead, Virginia City, Nev. Filed January 24th, 1896. Combination consisting of a pan having a conical bottom declining outwardly from the center and diverging sides extending upwardly from the periphery of the bottom, a pan-shaped muller having a conical bottom and diverging sides extending upwardly from its periphery, the bottom having a concavity slightly less in depth than the corresponding convexity of the bottom of the pan, a hollow cone extending upwardly from the center of the muller having an opening or openings in the side, an annular bowl surrounding the cone below the openings adapted to receive the ore and deliver through the openings into the interior of the cone, a preliminary corrugated crusher fixed within the lower part of the cone, a shaft extending upwardly from the top of the cone, and a horizontally rotating crank with which the upper end of the shaft is connected whereby a gyratory motion of the muller and crusher is produced.
- 559,986. **AMALGAMATOR.** Alexander C. Rumble, San Francisco, Cal. Filed September 9th, 1895. Combination consisting of a cylinder formed of two segments, flanges along the edges of each segment, hinges by which the adjacent flanges upon one side are connected together, the hinges consisting of screw-threaded eyebolts pivoted to one of the flanges, extending through holes in the opposite flange having nuts by which the flange is adjusted with relation to its opposing one and clamped to the bolts, a means for locking the flanges upon the opposite side, when the two parts of the cylinder have been closed, and an interior lining consisting of segmental amalgamated plates extending from end to end and having radially-projecting ribs formed by folding the plates, flanges projecting between the meeting edges of the two segments, and elastic gaskets, whereby tight joints are formed along the edges.

PERSONAL.

MR. FRANK P. GOULDING has been elected a trustee of the Worcester Polytechnic Institute, Worcester, Mass., to fill the vacancy caused by the death of W. W. Rice.

MR. E. C. FELTON, General Manager of the Pennsylvania Steel Company, of Steelton, Pa., has been elected President to succeed Mr. L. S. Bent, and will also retain his position of General Manager.

MR. J. L. BUSKETT, who has been connected with a number of Montana mining enterprises and until recently was a resident of Butte, Mont., has gone to Union de Tula, Jalisco, Mexico, on professional business.

CAPT. HENRY GUYER, the well-known mining man, who has been in Peru, South America, for the past seven years, and represented Messrs. Fraser & Chalmers, at Lima, is at present in New York. He will remain in this country until November, when he will return to Peru.

PROF. HAROLD B. SMITH, of Purdue University, Lafayette, Ind., has been elected Director of the School of Electrical Engineering to be established at the Worcester Polytechnic Institute. Professor Smith will organize the department for the coming year. He is a Cornell graduate, class of 1891, and has been in charge of the Department of Physics and Electricity in Purdue for some time.

MR. B. VAN VORSTENBERG, who for the past two years has been engaged on the statistical department of *The Mineral Industry*, having completed the collection of statistics for the forthcoming Volume IV., sails to-day for Europe on a well-earned vacation. Upon his return he will resume his duties in preparation of the fifth volume of this great work.

MR. C. N. FENNER, mining engineer, has been engaged as assistant to Mr. Edward Bates Dorsey, of London, who has gone to British Columbia on professional business. Mr. Fenner has secured this appointment through the well-known "Positions Vacant" column of the *Engineering and Mining Journal*, the means by which many professional men have procured excellent engagements. The leading mining men everywhere now recognize this as the best means to secure the proper assistants.

OBITUARY.

FREDERICK SHIVELY, superintendent of Jones & Laughlin's iron mills, of Pittsburgh, Pa., died in that city, May 17th, aged 59 years.

PETER HARVEY, formerly superintendent of the Coleraine colliery, which position he resigned only a few weeks ago, upon his return from Ashville, N. C., died May 10th at Hazleton, Pa.

JOHN BARNITZ BACON died in New York, May 18th, aged 81 years. He was connected with the New York City finance department from April, 1877, to 1880, and was reappointed in 1883. He was a civil engineer, and was one of those who worked on the laying out of Central Park.

EDWARD HAWKES BUCKINGHAM died in Chicago, May 1, aged 49 years. In 1873 he became bookkeeper at the Chicago Steel Works and within two years was appointed general superintendent, subsequently filling in turn the offices of treasurer and vice-president.

ARCHIBALD PAULL MITCHELL, president of the Hardware Publishing Company, died suddenly at his home in New York City on May 17th. He was a man of tireless activity, and devoted himself to his business duties with such energy as to lead his friends and associates to remonstrate with him and to urge him to take a needed vacation. This advice he did not heed, but while he probably overtaxed his strength of late, his death was altogether unexpected, and the shock to his friends was all the greater. He was born in Wheeling, W. Va., in 1849. His father was ex-Judge Samuel Mitchell, a well-known West Virginian lawyer, and his mother was Elizabeth Paull, a member of the well-known Paull family of Kentucky. The son was educated under the direction of a tutor at his home, and afterward attended one of the small colleges not far from Wheeling. When about 29 years of age he came to New York, but for some years did not enter any business. He then entered the wholesale grocery firm of H. K. & F. B. Thurber as manager of the traveling salesman department, which place he held for nearly 10 years, remaining with the firm after it became the Thurber Whyland Company. He was connected with the advertising department of the *Engineering and Mining Journal* for a time, doing some valuable work, and in 1890 he founded *Hardware*, a paper devoted exclusively to the hardware trade, which under his management has been deservedly successful. Mr. Mitchell was also one of the originators of the Hardware Club, the well-known downtown business men's club which has rooms in the Postal Telegraph Building. He was also a member of the New York Club. He was a man of great business ability, probably one of the ablest in his own line in this country. He had a happy faculty of making friends and of keeping them wherever he went. Personally, he was a genial and kind-hearted man, endowed with personal magnetism to a remarkable degree, and his death will be sincerely mourned by all who knew him, either in a business capacity or socially.

Work on the raising of No. 2 Paxton furnace, at Harrisburg, Pa., is progressing slowly. Some trouble has been occasioned by a salamander in the bottom of the furnace.

SOCIETIES AND TECHNICAL SCHOOLS.

STATE UNIVERSITY OF WASHINGTON.—A chair of mineralogy and geology has been instituted by this university.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—The last meeting of the winter session was held in the society's rooms in Montreal on May 21st. The paper by Mr. Mohun on "The Sewerage of Victoria, B. C." was fully discussed by the members present.

WESTERN SOCIETY OF ENGINEERS.—A regular meeting of the society was held in Chicago on May 6th, First Vice-President Thos. T. Johnston in the chair. The secretary announced the appointment, by President Wallace, of Messrs. Edgar Williams and John Ericson as a committee to act with the Illinois Society in the matter of sanitary legislation. Then followed an interesting paper on the subject of "Foundations" by Mr. George E. Thomas, which evoked considerable discussion.

MONTANA SOCIETY OF CIVIL ENGINEERS.—The regular monthly meeting of the society was held at Helena on May 9th. Senate Bill 2301, which provides for the establishment of engineering experiment stations, after having been read and discussed, was, on motion referred to Prof. A. M. Ryon, who, as a committee of one, was directed to investigate the merits of the bill and report at the June meeting. Mr. Finlay McRae was elected trustee by acclamation to fill the vacancy caused by the resignation of W. A. Haven.

THE CIVIL ENGINEERS' CLUB OF CLEVELAND, O.—At the meeting of the club held May 12, Mr. E. A. Sperry read a paper on "Steam Engines for Direct-Connected Electric Generators," describing invention by means of which the generator makes two revolutions at each stroke of the engine. In the discussion which followed some interesting facts regarding rotary engines and steam turbines were presented. Messrs. R. L. Newman, S. W. Hayes, A. M. Waitt, C. O. Arey and W. B. Cowles were elected to active membership, and Messrs. W. J. Walker, S. B. Sheldon, H. P. Fairfield and Wm. Socher were elected to associate membership.

AMERICAN FOUNDRYMEN'S ASSOCIATION.—Under the style "The American Foundrymen's Association," the big gathering of foundrymen in convention at Philadelphia, Pa., effected a permanent organization on May 13th, and adopted a constitution and by-laws. The second day's session was held in the hall of the Franklin Institute. At the morning session an interesting paper on "The Chemistry of Iron, with Determinations and Their Value," was read by Henry James, M. E., of Henry Disston & Sons, W. J. Keep, of Detroit, Mich., read a paper on "The Physical Tests and Chemistry of Cast Iron," and S. Groves, of Taylor, Wilson & Co., Pittsburg, presented one on "Gear Moulding and Gear Moulding Machines."

The constitution and by-laws, drawn up by a committee made up of the following delegates: A. Large, Jr., of Chicago; William Taylor, of Pittsburg; Frank & Magee, of Boston; J. Best, of Montreal, and C. S. Bell, of Hillsboro, O., after an hour's discussion, were adopted as recommended. The constitution provides that the association shall be styled "The American Foundrymen's Association," and its object shall be "the advancement of the interests of foundry operators, or all who are concerned in the casting of any kind of metal in sand or loam moulds for any purpose; to collect for the use of the association all proper information connected with the foundry business, and to interchange experience and encourage uniform customs and actions among foundrymen." Officers will be elected at once. They will be a president, eight vice-presidents, representing various sections of the country, a secretary and treasurer.

INDUSTRIAL NOTES.

The Saucon Furnace of the Thomas Iron Company, at Hellertown, Pa., has been blown out.

Johnson & McMaster, Landsdale, Pa., will start a wire nail and bale tie factory and will put in machinery.

The Harrisburg (Pa.) Chain Works will be enlarged in the very near future, and will contain new and improved machinery.

The Midvale Foundry Company, Allentown, Pa., is erecting a new brick building 75 x 100 ft., one story high, for use as a molding shop.

The New Jersey Steel Tube Company, Newark, N. J., has leased the plant of the Nutley Manufacturing Company, to manufacture steel tubing.

The Hollidaysburg (Pa.) Iron and Nail Company has purchased grounds adjacent to its plant, additional space being needed for storage purposes.

The Chattanooga (Tenn.) Pipe and Foundry Company has let the contract for the electrical equipment for its new plant. The cost will be about \$15,000.

The blast furnace of the Kemble Iron Company, at Riddlesburg, Pa., which was damaged by fire a few weeks ago, has been thoroughly repaired and is again in blast.

Geo. Durell has been appointed receiver of the Harriman (Tenn.) Iron Company, and will make efforts to arrange for the early resumption of operations of the rolling mill.

The Whittaker Iron Company's plant at Wheeling, W. Va., closed down last week, but will resume operations soon. During the idleness the company will make some needed repairs.

The National Tin Plate Company, of Anderson, Ind., is contemplating the erection of a large open-hearth steel rolling mill for the manufacture of steel to be used in their tin mill.

The Clearfield Fire Brick Company, through its agent, John Richardson, has contracted to furnish the brick to line the Mary Furnace, Lowellville, O., and the Mattie Furnace, at Girard, O.

The property of the old Brady's Bend (Pa.) Iron Company has again been put up for sale. Joseph Pool and Harward R. Pool, of New York City, hold judgments against the last purchasers.

The large pipe foundry at Radford, Va., has been sold by M. C. Armour, receiver, to representatives of the stockholders for \$85,000. A new company will be organized to carry on the business.

The Susquehanna Iron Company, at Columbia, Pa., has suspended work and its guide mill heating furnace, will be torn down and rebuilt. The fireplace will be enlarged and general repairs will be made.

The Central Expanded Metal Company's plant, at Rankin, is being improved by installing machinery which will turn out material from plates up to $\frac{7}{8}$ in. thick, the limit on the old machines having been $\frac{1}{2}$ in.

The Pennsylvania Steel Company, of Steelton, has been awarded the contract for \$500,000 for the construction of the new steel arch bridge, which is to replace the present railway suspension bridge across Niagara River.

The Cumberland (Md.) Steel and Tin Plate Company, which went into the hands of receivers March, 1895, has paid the unsecured creditors 37% and secured an extension on the balance. The receivers have been discharged.

The Vulcan Iron Works, at San Francisco, were destroyed by fire on May 10th. The loss is estimated at \$100,000, with \$31,000 insurance. The fire communicated to the Reliance Machine Works, destroying considerable stock.

The new furnaces of the Franklin (Pa.) Steel Casting Company, completed recently, are now in active operation. The company is rushed with orders and as soon as additional skilled men can be secured the plant will be run double turn.

The Leechburg Foundry and Machine Company, of Pittsburg, has received a contract from the Iron-dale Steel and Iron Company, Middletown, Ind., for an additional cold mill, to be attached to the old train, also one of its No. 3 bar shears, with engine attached.

The Benwood plant of the Wheeling Steel and Iron Company, of Benwood, W. Va., has been idle for a week or more. During the intermission the puddling furnaces have been repaired and new lids put on the stacks. Some repairs were also made to the engine in the skelp department.

At a meeting of the De La Vergne Refrigerating Machine Company, held in New York City on May 20th, Mr. Jacob Ruppert was unanimously elected president in place of I. C. De La Vergne, deceased. Mr. Ruppert is personally a large shareholder and the executor of the De La Vergne estate.

The Washington Tool Company, which was recently organized at Washington, Pa., with a capital stock of \$20,000, has secured a plant at that place. James A. Little, M. H. Borland, T. B. H. Brownlee, A. W. Pollock, A. J. Zahniser and others are interested. The company will manufacture small tools.

It is said that the long contemplated change in the North mill of the Scranton (Pa.) Steel Company will shortly be made and the mill will roll structural shapes instead of steel rails. The mill has been making steel angles and beams for some time and the change to merchant rolling mills will be permanent.

The Keystone Bridge Works, of the Carnegie Steel Company, has secured the contract to furnish 6,500 tons of material for a bridge across the Monongahela, from Homestead to Rankin, for the Pittsburg, McKeesport & Youghiogheny Railroad. The present bridge and elevated track are but single track, and it will be doubled by building an additional track and bridge.

The Montgomery, Ala., Iron Works is making extensive improvements to its plant and adding new machinery, and, it is reported, will engage in the manufacture of bicycles, besides constructing iron work. Operations will be resumed under the name of the Southern Iron Works, which has just been incorporated by A. S. Woolfolk and T. G. Caffee; capital stock, \$60,000.

The annual meeting of the stockholders of the Crane Iron Company, of Catasaqua, was held last week and the following directors elected: Leonard Peckitt, of Catasaqua; R. S. Kennedy, Jos. S. Harris, Jr.; W. H. Piling, G. R. Frootman, Robt. H. Hastings and G. M. Onges, of Philadelphia. Mr. Peckitt was subsequently chosen president and James M. Hodge secretary and treasurer.

The Virginia Coal and Coke Company is pushing its work on Callahan Creek, near Big Stone Gap, Va. At present 75 coke ovens are in full blast. They turn out an average of about seven carloads of coke daily. Twenty-five additional ovens have been completed and will be in blast soon. It has been decided to build 200 more ovens, and when these are completed and put in operation the daily output of the coke industry at Big Stone Gap will be about 30 cars. The coke is said to be of very good quality.

Mr. W. J. Rainey reports that upon his Westmoreland County, Pa., property, which consists of about 1,000 acres of land, near Mount Pleasant, there will be built during the present year 250 to 300 coke ovens. There is also in process of construction a plant of 500 ovens at Mount Braddock, Pa. At the Elm Grove Works the plant is being enlarged by the addition of 100 ovens, the Paul plant is being increased by an additional 100 ovens, and the Moyer plant is having rebuilt 16 to 20 ovens which have been out for a long period.

The Manown Manufacturing Company, recently organized by Pittsburgh and Cleveland capitalists, has opened an office at Pittsburg, Pa. The company manufactures fire brick, sleeves, nozzles and runner brick used in connection with Bessemer and open hearth steel plants, and has its works at Manown, near Monongahela City. The plant is complete, having a drying house 40 x 225, capable of holding 58,000 brick and the latest improved machinery for making brick. At a meeting held recently, T. E. Young was elected president; D. R. Hanna, vice-president; H. J. McCracken, secretary, and B. F. Johnston, general manager.

TRADE CATALOGUES.

The H. Channon Company, of Market street, Chicago, Ill., which has been in business for more than twenty years, has just issued a very complete catalogue, dealing with contractors and railroad supplies handled by the concern. It is a volume of 242 pages, very carefully indexed and must be useful to any purchasing agent of a railroad or contractor needing their particular line of supplies. The principal of these are: wire rope, manilla rope, wire-rope fittings, wooden tackle blocks, iron tackle blocks, iron and wooden snatch blocks, hand powers, hoisting engines, capstans and windlasses; in addition to all the ordinary hardware supplies required for railroad and contracting works. The book is well illustrated and full of very complete information with instructive remarks and technical details. Another catalogue dealing with tents, covers and awnings has been issued and can be had upon application to the company.

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GENERAL MINING NEWS.

ARIZONA.

YAVAPAI COUNTY.

HAMILTON, POLAND AND BELL TUNNEL.—This tunnel, in the Big Bug district, is now in over 1,550 ft., and shows a continuous ore body for 2,000 ft. The ore is high grade and said to average \$65 per ton silver, and the average width of the pay streak is 20 in.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

KEYSTONE CONSOLIDATED VS. SOUTH SPRING HILL MINING COMPANY.—The lawsuit between these companies has been transferred from Amador to Calaveras County on account of the disqualification of Judge Rust, who was one of the attorneys in the case. Preliminary motions for the settlement of the pleadings and for an order for survey occupied the attention of the Superior Court all day May 9th. The complaint alleges a wilful trespass by defendant on the dip of plaintiff's ledge, and also across plaintiff's south end line, and demands damages in the sum of \$2,000,000. The answer denies the trespass on the dip, admits an unintentional trespass across plaintiff's south end line and also an unintentional trespass across the same line upon a ledge which, upon want of information, it denies to belong to the plaintiff.

EL DORADO COUNTY.

(From Our Special Correspondent.)

OLD JUDGE MINING COMPANY.—This company has filed articles of incorporation. Directors: T. W. Husted, H. Otterson and W. W. Boughton, of San Francisco; F. W. Beardslee, of Alameda, and C. C. Shepardson, of Los Angeles. The Old Judge Mine, which is located near Kelsey, will be reopened by the company at once.

KERN COUNTY.

(From Our Special Correspondent.)

BAROSSA.—This mine is located seven miles northeast of Keene, on Barossa Mountain, and is owned by Los Angeles parties. A mill has just been shipped to the mine. The development work consists of 400 ft. of tunnel and drift, with about 100 ft. of shaft work, all in the vein, which varies from 3 to 10 ft. in width. The dump contains about 2,000 tons of ore, which, it is estimated, will average \$15 per ton.

HEALD MINING DISTRICT.—This district, at Goler, about 12 miles north of Randsburg, is coming to the front. A 15-ft. ledge has been located, which assays well. Eight claims have been located by F. H. Heald and others, who have also located a mill site and 640 acres of coal land adjoining the mine. Water is plenty. This is the only quartz ledge found at Goler.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

NUMBER ONE.—This mine, in the Quartzburg Mining District, one-half mile northeast of the Washington Mine, is continuing the development work and arrangements are being made to erect a mill. Milling tests, it is reported, show the ore to run about \$25 per ton free gold, while the sulphurets assay \$450 per ton.

TYRO.—As this mine, located on the West Lode, 1½ miles south of Coulterville, rich ore is said to have been encountered in the south drift. The 10-stamp mill has been started up.

NEVADA COUNTY.

(From Our Special Correspondent.)

REWARD.—The new machinery at this mine in Nevada City is in successful operation. The hoist and twin engines are said to be capable of sinking the shaft 2,000 ft. During the past year the company has extended the old California tunnel into their ground for a drain tunnel; it is now in about 2,500 ft. The new shaft has been connected with the old one by a drift 630 ft. long, which passed through a good body of ore. Sinking will now be commenced on the old shaft, which is down 300 ft.

PLACER COUNTY.

(From Our Special Correspondent.)

MAYFLOWER.—This gravel mine, near Forest Hill, is running a new tunnel for the upper lead, which it is expected to reach in about three months. This lead has already been located by borings from the surface. An upraise is being made from the main tunnel which will enable the company to increase the working force.

SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

SIDEWINDER.—This mine, nine miles from Victor, has been sold to Oregon parties for \$240,000. It was estimated that there were 12,000 tons of ore in sight, which was worth \$20 per ton. The new owners will commence work at once.

SHASTA COUNTY.

(From Our Special Correspondent.)

ELLIS BROS.' CLAIMS.—This group of six claims, situated about five miles northeast of French Gulch, near the Gladstone Mine, has been sold to George C. Richards, manager of the American Mine in Kline's Gulch. The price was \$10,000. About \$3,500 has been expended in building a road and in developing the property. A 220-ft. tunnel which taps the ledge at a depth of 70 ft. shows a 4-ft. ledge of free-milling ore which working tests show to average \$20 per ton. The ore from this mine will be crushed by the 10-stamp mill at the American Mine.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

EMPIRE.—This mine, on Empire Creek, one mile from Gottville, is developed by two tunnels, and has a 12 stamp mill run by water power. A 6½-ft. vein of low-grade, free-milling ore has been developed, which increases in richness as they go in.

TRINITY COUNTY.

(From Our Special Correspondent.)

RED HILL.—A French company has bonded the Red Hill, Connection, Lost Treasure, Rowles, Angel, Ingleside, Minersville and Haywards, placer mines which compose what is known as Hayward's Flats and comprise 470 acres. Two water-rights are also included, one from Stuart's Fork, the other from Swift Creek. The gravel bank is about 50 ft. deep, and is said to prospect 20c. per cubic yard.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

MOUNTAIN BELLE.—This mine, north of the Soulsby mine, at Soulsbyville, has been leased by J. W. Ball and others. The last clean-up netted \$1,275.

SPRING GULCH.—This mine, about four miles southeast of Summerville, which has been idle for many years, is now being worked by Salt Lake people. The shaft down 500 ft. has been retimbered, and drifts have been run north and south 100 and 150 ft. respectively. A new hoisting plant has been put in and the other machinery repaired.

COLORADO.

BOULDER COUNTY.

BUENA.—The ore body has increased remarkably both in size and value. Development has been suspended until the workings can be thoroughly timbered and repaired.

COLUMBIA.—W. W. Huling has secured the Columbia and opened up a good vein of ore a few days ago. The Madeline mill has been started up on the Columbia ore.

CRESON.—For weeks past a 13-year-old boy, with a small cradle and a limited supply of water, has been meeting with great success, and collecting extraordinarily large amounts of coarse gold. Excitement has been stimulated to a remarkable degree and the Creson Company, comprising a large number of local capitalists, has been formed to thoroughly prospect the ground in search of the mother vein. A group of claims has been secured, and a tunnel will be run 200 ft. to the Independence, where it is thought the main vein will be cut.

DEW DROP.—The output has increased to 35 tons daily from the stopes. The tunnel level is blocked, owing to the inability of the trimmers to remove the ore as rapidly as broken. The new mill is making 5 tons of concentrates per day of 10 hours. Steam power is to be put in at once. In the main tunnel of the Dew Drop a vein 1 ft. wide of good smelting ore was opened up this week. Crosscuts have been run north and south to catch a continuation of the main vein.

DREAM.—J. W. Gagghagen, with a small force, is operating the Dream lode, with a small streak of ore in sight.

GLADIATOR.—Caise Bros. secured control of this property a short time ago and are now mining rich ore as a result of the venture.

GOLDEN AGE.—Johns & Evans, in the tunnel level, have struck a good pay streak and are shipping regularly. Emmett & Co., at a lower level, also have a rick streak.

GOLDEN RULE.—The new plant of hydraulic machinery has arrived from Cincinnati, and a force of men is engaged placing it in readiness for operation. Foreman Undersott will have charge.

GOLDEN SUNSHINE MINING COMPANY.—This company was incorporated this week for the purpose of developing the Tillie Butzel group, including the Tillie Butzel, Focus and Cleveland, situated at Sunshine. The officers are: John Marder, president; Arthur Erbe, vice-president; Henry Dibblee, treasurer; Robt. S. Earhart, secretary. The three first named are citizens of Chicago. John Fillins, of Denver, has been appointed general manager, and R. A. Long will be the company's attorney.

HOUSATONIC.—The last shot disclosed a large vein of the best ore yet found in that ground, and the mine was at once shut down to put in a Davis whim.

INDEPENDENCE.—While working an assessment this week, Evans & Collins struck a rich pay streak, and a force of men is now at work sinking the shaft. Shipments will be made next week.

INTER-OCEAN.—Lessees of this property have opened up a streak of rich ore. A sample lot of 37 lbs. being run through the mill to-day gave 208 oz. gold and 352 oz. silver per ton.

JOHNSON.—Hanby and associates are working profitably, securing large nuggets of gold in a tellurium matrix. Johnson & Eggleston have also struck a rich streak in another level.

LADY JANE.—A force of men will be put in next week, and work will be resumed after a long idleness. This is an auriferous lead vein with an adit level 90 ft. long, which crosses near the breast a 10-ft. vein of auriferous iron in the Defender lode, and 20 ft. further on will cut the Washington, in search of which the Lady Jane tunnel will be driven.

LONE STAR.—George Lytle, who is operating this property, has struck a wedge-shaped streak of ore, 5 in. wide, running \$300 per ton.

MISSOURI PLACER.—In sinking 4 ft. to bedrock, Davis Bros. took out 40 lbs. of tellurium worth \$5 per pound.

MONITOR.—Three men have been added to the force, and the vein is now 2 ft. wide, averaging \$30 per ton. A sample shipment was made this week.

NEW CYANIDE WORKS.—A company has been organized for the purpose of introducing the McArthur-Forest cyanide process in the treatment of Boulder County ores, and several plants will be erected immediately. The company is capitalized at \$500,000. The directors are: W. H. James, general manager of the Omaha & Grant Smelting Works, Denver; Dennis Sullivan, Director of the Denver National Bank; William H. Emanuel, of the Allis Machinery Company, Milwaukee; Hugh Butler, attorney-at-law, Denver; Thos. W. Good, manager and Chas. S. Dick, secretary of the Gold and Silver Extraction Company of America.

NEWMARKET.—The recently-discovered ore body has increased in size and value. Preparations are being made to open out on a large scale, limited room at present allowing only a small force of miners to work. Negotiations are also pending for the purchase or lease of a 10-stamp mill to handle the product.

PLEASANT VIEW.—At a depth of 40 ft. Bowen & Daniels struck a large-sized vein of ore this week running 5 oz. gold and 175 oz. silver. Shipping will begin next week.

PROVIDENCE.—Judge Bentley is erecting a new mill, especially designed for treatment of the John Jay ores. It will be in operation June 1st.

SARAH.—This property has developed into a regular shipper as the result of a strike this week of good smelting ore. The product goes to the Argo works.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.
(From Our Special Correspondent.)

CALEDONIA.—This mine has been sunk 280 ft. on a 36% grade. The vein in the bottom of the shaft looks well, and a seam 2 in. wide yields tellurium in very good specimens. The object of the owners is to sink the shaft 400 ft. and only take out the ore from development, which from the present showing should meet all expenses. A pump at the incline lifts the water to the bottom of the vertical shaft, when it is raised to surface by means of barrels.

CHIEF.—This mine, on Raven Hill, has recently shipped 20 tons from the new vein found when sinking the shaft at the depth of 170 ft. The Chief is improving and will shortly rank as one of the producers.

CHRISTMAS.—This mine is under the management of Captain Rowe, a well-known mining man from Norway, Mich. The old buildings will be replaced by substantial shaft and sorting house. The directors recently purchased the machinery used in sinking the main Portland shaft.

DOCTOR.—This property on Raven Hill maintains its output of twenty tons a day. The deepest level in the mine proves that the vein between the ore-shoot, for 3 ft. wide, carries value of \$20 per ton, whereas, in the upper levels the vein between the ore-shoots, which are four in number, as far as explored, had only a value of from \$3 to \$8, and was thrown over the dump.

ELKTON MINING COMPANY.—This company has just declared its first dividend since December, 1894. The dividend now is \$10,000. The property looks well.

FREIGHT RATES.—The railroad companies have agreed on the following schedule for ore freights: Three dollars a ton on all ores yielding less than \$30 per ton; \$4 per ton on all ores sampling from \$30 to \$100 per ton, and \$5 on all ores averaging over \$100 per ton. These prices are f. o. c. The former price was a uniform rate of \$5 per ton at the mine. The mines having low-grade ore will be benefited, while mines shipping high grade will as a rule pay \$1 per ton more. For instance, the Moose has not for two months shipped any ore less than 5 oz.

GOLDEN CRATER.—This property, formerly the Deerhorn and Summit, on Globe Hill, has closed down. The reason is not stated, as there were funds in the treasury to sink the shaft 1,000 ft. deep. The present depth of the shaft is 620 ft.

GOLDEN FLEECE MINING COMPANY.—The Colorado City on Bull Hill, owned by this company, has sunk the shaft 160 ft. and is drifting on the vein. The mine employs 19 men. No stoping is being done, and a little ore is being taken out from the development.

GROUSE.—This property, being worked under the receivership of Mr. William Trevonow, the lessees having incurred a debt for wages of over \$8,000, is doing fairly well. For April a profit of about \$1,100 was made, and this month that amount will in all probability be doubled, as already 150 sacks of ore have been broken. The average of the samples shows close to \$1,000 per ton. For April 8,400 lbs. sampled 2½ oz. and 8,100 lbs. 25¼ oz. The milling ore averages about \$20 per ton. The royalties amount to 30%.

INDEPENDENCE EXTENSION.—This property, south of the Independence mine, has a shaft sunk 200 ft., and a drift north from that point shows the value of the pay streak to vary in value from \$25 to \$50.

MOOSE.—This property employs 53 men. The shaft is now 650 ft. A pump has been ordered to handle the water. All development work from the 8th to the 10th level has been abandoned, as the vein for 150 ft. in depth was unproductive, but above and below the 8th and 10th levels the vein is productive.

NUGGET MINING COMPANY.—The Katherine, owned by this company and situated on Raven Hill, has driven a crosscut west from the 415 ft. level 75 ft., but thus far without intersecting a vein. The next new feet should cut what is known as No. 2 vein, found in the crosscut at the 100 ft. level.

PURITAN MINING COMPANY.—The Minnie Lew shaft on Ironclad Hill, and worked by this company, has been sunk 140 ft., it being the intention to sink 150 ft., and at that depth crosscut to the vein. The rock in the shaft assays better than previously.

RAVEN TUNNEL.—This tunnel, which is penetrating Raven Hill from the north or Squaw Gulch, has been driven 900 ft. An 80-H. P. boiler and a four-drill compressor are on the ground and will soon be in working order, the present compressor plant being altogether inadequate to furnish power. The Raven mine ships from 70 to 80 tons of ore per week, of average grade of 2½ oz. One car lot last week sampled 7½ oz. The mine employs 44 men. The level on the vein has been driven 1,310 ft., but the vein on the face is a little broken. The shaft on the top of the hill to connect with the Raven tunnel has been sunk 140 ft., a two compartment shaft, each compartment being 4 x 4 in the clear. The size of timbers is 8 x 10 in.

SACRAMENTO.—The Miller lease on the Sacra-

mento claim has been sunk 175 ft., and at that point a drift has been started. The present prospects of this lease are by no means flattering.

SPICER.—This claim, located in 1891, situated in the town of Victor, and being worked under lease and bond by Mr. Swanson, has a shaft sunk 140 ft. on a well defined vein 5 ft. wide. The vein carries but little value thus far. The formation is granite.

STRONG.—This mine is preparing to put a pump at the 400-ft. level. At the next level a station will be cut and a large stationary pump will be fixed. The owners are evidently preparing for an influx of water, the water column having a diameter of 6 in. The mine shows so well that a new hoisting plant will be erected during the autumn months.

THOMPSON.—This property, on Raven Hill, recently made a 50-ton shipment to the Arkansas smelter, which sampled over 1½ oz. A new vein has recently been exposed south of the main shaft.

VINDICATOR.—The shaft has been sunk 220 ft., the object being to sink to the 400-ft. level, and at that point to thoroughly explore the ground. The new vein at the 200-ft. level has been driven on north for 65 ft., the vein being fully 5 ft. wide. A 20-ton shipment was made from this vein, without any sorting, which sampled \$44.80 per ton. The mine from the 1st to the 15th inst. shipped 160 tons, 60 tons of which sampled from 3 to 5 oz. and the balance 1½ oz. The mine employs 25 men.

GILPIN COUNTY.
(From Our Special Correspondent.)

AURORA.—Professor Van Diest, of Denver, is here for Eastern parties inspecting this mine in Russell Gulch.

BROOKLYN.—The ore from this mine treated at the new mill recently built on Clear Creek, was very poor, and it is unlikely that it paid expenses. It is now reported that the mill is to be run on custom ore, but in view of its small capacity and necessarily high expenses it is difficult to see how it can compete with other Black Hawk custom mills.

CORYDON.—Good progress is being made with the hoisting of the water. The mine will, it is expected, be drained to the bottom within a couple of days, after which the new pump should have no difficulty in dealing with the spring floods.

GUNNELL MINING COMPANY.—The injunction applied for by the Concrete mine against this company to restrain it from working within the end lines of the Concrete property, has been granted, a cross application for an injunction being refused. Meantime a large quantity of ore, probably 1,000 tons or more, has accumulated outside the Gunnell company's mill, all of which is generally believed to have been extracted from the disputed ground.

PINE CREEK.—A telephone line will shortly be extended from Central City into this camp, connecting it with the Colorado Telephone Company's system.

SARATOGA.—A contract is to be let to sink the shaft another lift of 100 ft. below the present level of 700 ft.

WAIN.—Work has been resumed on this property in Chase Gulch and water is now being hoisted from the shaft.

LAKE COUNTY.
(From Our Special Correspondent.)

ARENA MINING COMPANY.—This company has leased its Isard shaft to Leadville parties who have commenced shipping low-grade lead ore.

BANGKOK CORA-BELLE.—In a recent report on this property by Manager Estey, he states that the mine has only been worked on half the upper contact, and that since November, 1895, the Union Leasing Company has received from the smelters from the product of this mine \$230,000, of which \$60,000 royalty has been paid; that the mine is now shipping 10 tons a day of ore assaying 60 to 83 oz. silver per ton. A new body was opened up a few weeks ago and shows 3 ft. of ore assaying 60 to 90 oz. silver.

BIG FOUR MINING.—The stockholders will hold a meeting in Chicago this week. The reports will be satisfactory and will show that a good ore body has been opened up, and the conditions are encouraging. Further that over \$100,000 worth of ore has been shipped since the property was opened up about nine months ago.

LEADVILLE BASIN MINING COMPANY.—These people operating the Newell shaft, at a depth of 560 ft. encountered the main lime-porphry contact, and are now drifting in order to open up the main ore body.

LEADVILLE MINES LEASING COMPANY.—This company is operating the Sixth street shaft and this week increased shipments to 100 tons a day. Most of this iron goes to the Illinois Steel Works.

LOUISE.—An ore body is certain to be opened up in this property. While no large body of mineral has yet been encountered assays from drift stuff, are encouraging.

MAID.—These people are pumping an immense quantity of water and are draining surrounding properties. They are endeavoring to secure other mine owners in the neighborhood to contribute a certain percentage of the pumping expense. Rumors are afloat that in case this is not done that the Maid people will pull their pumps. This would prove disastrous, and it is hoped that a satisfactory agreement will be reached.

MARIAN.—This is under lease to the Small Hopes

people, and some important development work is being carried on at a depth of 1,000 ft. One hundred tons a day of very good sulphide ore are being shipped.

MONARCH MINING COMPANY.—A fine plant of machinery has been placed on the Virginus, and the new shaft of the Monarch has reached a depth of 175 ft. A little further depth should open up the rich ore chute which netted the Cleveland people so many thousands when then they worked in the early days.

PENROSE.—After 10 days' work clearing out the "sand break" and fixing the pumps, this mine has resumed regular shipments.

RESURRECTION.—About 25 tons daily of a low-grade ore are being shipped. Vigorous work is being carried on at the 700-ft. level.

SMITH-MOFFAT GROUP.—The output shows a decrease of over 1,000 tons for April. This is largely due to the falling off of tonnage from the Wolfstone, where the rich ore bodies have about been exhausted and no new development work is being done. The various properties of the group are credited with the following tonnage: Gray Eagle and Pocahontas, 1,147 tons iron, 156 tons carbonate; Wolfstone, 1,120 tons sulphides; Maid of Erin, 2,000 tons carbonate and sulphides; Starr, 1,518 tons carbonate and sulphides; Bon Air, 866 tons carbonate and sulphides.

STEWART GROUP.—News has reached Leadville from Empire Gulch that very good mineral has been uncovered in this group. It is claimed that 5 ft. have been opened up and that the carbonate stuff assays 29 oz. silver and fairly well in lead.

PITKIN COUNTY.

MINERAL FARM CONSOLIDATED MINING COMPANY.—Judge Bailey, of Canon City, has disposed of the matter of the Mineral Farm Consolidated Mining Company, in which the First National Bank petitioned for a receiver. The judge declines to appoint a receiver, but has made an order directing that the management set aside and deposit in the bank each month a certain percentage of the receipts from ore shipments. The order also provides that an agent of the bank may at any time visit and inspect the workings of the property. The bank is a mortgage creditor of the mining company to the extent of \$40,000.

FLORIDA.

ALACHUA COUNTY.

The phosphate mines in the western part of this county are now being operated to their fullest capacity, and large quantities of rock are being shipped daily.

IDAHO.

LATAH COUNTY.

SILVER WHITE.—These mica mines have a large force at work. A new electrical plant and hoisting works will be installed shortly.

SHOSHONE COUNTY.

HELENA & FRISCO MINING COMPANY.—At the annual meeting of this company, held in Helena last week, A. M. Holter was elected president, John T. Murphy vice-president, and A. J. Seligman secretary and treasurer. The old board of trustees, consisting of A. M. Holter, S. T. Hauser, John T. Murphy, A. J. Seligman, A. M. Esler and E. W. Knight, Jr., was continued. There will be no change in the management of the mine, Joseph McDonald remaining in charge, says the *Helena Independent*. This mine is now being worked at practically its full capacity, nearly 500 tons of ore being lifted to the surface daily.

MAMMOTH.—Development work is progressing steadily at this mine. A considerable amount of high-grade ore is being shipped and the low-grade ore is put on the dump to be handled whenever the company puts up a mill or arranges to use one already built.

POORMAN-TIGER.—The ground is being cleared on this property for the new concentrator which is to be erected.

KANSAS.

CHEROKEE COUNTY.

(From Our Special Correspondent.)

BILL NYE.—On the North Empire lease at the Bill Nye shaft they have just started an 8 by 6 ft. drift, and 12 ft. from the shaft they struck a good run of lead and zinc ore in open ground, and will make their first turn-in of ore this week.

BRINDLE STEER.—At the Brindle Steer shaft on the De Graff Brothers' lease they are drifting at 113 ft. on a 16-ft. face of lead and zinc ore in open ground and last week turned in 9,200 lbs. of lead, but did not sell any zinc ore. They have just opened up this mine.

CONNOR LAND.—The Noble-Shriner Mining Company has leased 40 acres of the Connor land at the head of Cooper Hollow. There are 22 prospect shafts going down on the lease, and four that are producing pay dirt.

EUREKA.—At the Eureka shaft on the Masten land they are drifting at 80 ft. on a large face of lead and jack in shooting ground, and last week turned in 14,000 lbs. of lead, but did not sell their zinc ore.

HEDGES COMPANY.—The Hedges plant, on the Ladies' lease is running steadily on rich dirt, and are producing from 30 to 40 tons of zinc ore each week. The men are drifting at 80 ft. in three directions on a large face of disseminated ore.

KEYSTONE COMPANY.—On the North Empire lease the Keystone Company has put up a friction hoister, and is drifting at 80 ft. on a large face of lead and zinc in open ground. Last week it turned in 30 tons of zinc ore and 5,800 lbs. of lead.

LUCKEY MINE.—J. Luckey sold his half interest in the Luckey mine to G. W. Dausingberg for \$3,500 cash. This week they have opened up a 40-ft. face of lead and zinc ore in open ground and will make a turn-in.

MONTGOMERY & SON.—Last week Montgomery & Son started to drift at 110 ft. on an 8-ft. face of ore in open ground that is getting higher the further they drift. This week they are putting up a friction hoister and derrick, and will make a large output of ore weekly.

RYE BREAD COMPANY.—This company, on the Murphy land, has a shaft down on the lot near the Crown Point mine to a depth of 100 ft. The company is now sinking in a body of zinc ore, but will not drift until it has a large face of ore.

MARSHALL COUNTY.

GREAT WESTERN PLASTER COMPANY.—The miners of this company discovered another cave while excavating for gypsum. It is 60 ft. below the top of the hill, and no one knows how long, as they had not reached the end at 400 ft. The top roof is solid rock, sides gypsum and floor muddy.

OSAGE COUNTY.

OSAGE CARBON COMPANY.—This company recently closed all of its coal shafts at Osage City excepting one, throwing about 500 men out of work. On May 18th someone disabled the remaining shaft, No. 24, by exploding a charge of dynamite in the entry, and 500 more men were thrown out of work.

MARYLAND.

ALLEGHANY COUNTY.

GEORGE'S CREEK COAL AND IRON COMPANY.—This company has opened a new mine at Lonaconing, near mine No. 1, to be known as mine No. 4½. About 50 men are employed in this mine, the output of which will be shipped over the George's Creek and Cumberland Railroad.

MINNESOTA.

(From Our Special Correspondent.)

Shipments of iron ore from Two Harbors last week were 40,000 tons, and from Duluth about 35,000 tons. The shipments from Superior were something like 12,000 tons. Boats are still running quite largely in the grain trade, and shipments of wheat from Duluth for the four weeks of navigation have been about 11,000,000 bu., an amount that has kept a large fleet out of ore tonnage. It is interesting to note that, notwithstanding the talk of a restriction of the amount of ore to be mined and shipped this season, vessel men are of the opinion that there will not be sufficient tonnage to carry all the business that will press for shipment, chief of which, of course, will be ore.

The Duluth & Iron Range Railroad has surveyed a preliminary line to lands near McKinley, not meaning, necessarily, to build there at present. Options on these lands were held by a Gogebic Company last winter, but were allowed to lapse, and since are said to have been taken by local parties. Notwithstanding local reports nothing of value has been found on these lands.

The purchase of the lands of the C. N. Nelson Lumber Company by the Weyerhaeuser interests, for \$2,200,000, did not include the ores in the lands sold, all deeds reserving mineral rights.

There has been considerable said about the trouble between the Duluth, Missabe & Northern Railroad and the Ore Trimmers' Union. The road says there is no trouble, and that it proposes to keep in employment its old men, who are not members of the union. These men have been steadily at work on the docks. Last winter other men formed a union, and this spring asked for the discharge of the regular force and their own engagement in lieu. This the road naturally refused, and the Mayor has had a number of conferences and communications relative thereto. The road, however, maintains its position, and the federations have so far refused to take action.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

ARCTURUS MINING COMPANY.—This new company has a fine body of ore shown at what is now the most westerly deposit of merchantable ore on the range, two miles west of the Mesabi Chief mine. A depth of 140 ft. has been reached in ore, 10 pits being in ore.

MAHONING ORE COMPANY.—This company is using four shovels, two of them 60-ton affairs, in mine and dirt. The two mining shovels are not worked at the same time, but are capable of sending out a vast amount of ore. The stripping is in hard clay and boulders, but is easily handled. The stripped area of the mine is being steadily enlarged, though last fall there were over 500,000 tons exposed for open pit mining. The mine is shipping 2,500 tons a day steadily.

MOUNTAIN IRON COMPANY.—At the open pit of this company there has been put in operation the heaviest steam shovel the Consolidated Company has ever used, a 65-ton machine. It has been loading cars from the ore body at the rate of 20 per hour, or 10 tons a minute. This record it can keep up and a fair claim for 10 hours' work is not less than 180 cars. One feature of this shovel that will commend it to Mesabi operators is the fact that it

has a dipper lift of 16 ft. in the clear above the tracks, and a very long reach.

OHIO MINING COMPANY.—The tracks into this mine have been repaired and shipping will begin at once. The Drake-Stratton Company has contracts at a flat price for stripping and putting the ore on cars.

ROBERTS EXPLORATIONS.—Captain Roberts is doing explorations near the Fayal mine, on 5, 57-17, and has had several crews at work, besides a diamond drill. There is ore on the property, shown up by a drill, and the location is considered most promising.

SAUNTRY EXPLORATIONS.—An extension of the option on this property has been granted, and two drills are at work proving up the ore body. The price asked is very great, and the possible purchasers are taking every step to fully learn and prove the limits of the deposits.

SECURITY EXPLORATION COMPANY.—The explorations on the old Shaw lease, owned by this company, are being continued and ore has been shown to a depth of 185 ft., covered by a surface of less than 30 ft. There is an excellent mine, and the lower deposits are of ore of high grade and very low in phosphorus. Several prospective options have been talked of for the property, but it is likely to be found that the Minnesota Iron Company is the ultimate purchaser. It can operate the property in connection with its immediate neighbor, the Virginia, cheaper than any one else, and its relations to the Security are most cordial. It has been a very large buyer of Security properties.

VEGA MINING COMPANY.—This company has put in a 55-ton shovel and is loading its stockpile.

MISSOURI.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Messrs. Scott & Seborn are getting into a good vein of ore at their new shaft located just east of their old mine, which is producing from 45 to 50 tons of zinc ore each week.

BIG WINDY.—The work of sinking, which was suspended at the Big Windy shaft for several days on account of a slight accident, will be resumed this week. The Big Windy is located upon the Berry farm about 3½ miles southwest of Aurora, and a strike of mineral at that distance from the mines proper of the camp, will increase the price of land in that vicinity.

LITTLE NUGGET.—John S. Wilson, who has the Little Nugget lease on the Kentucky land, is drifting on a large face of zinc ore in open ground and will make a large turn-in this week.

LEAD QUEEN.—The Lead Queen shaft on the Berry land is now down 106 ft. and are still sinking in ore. They have been sinking in silicate for the last 30 ft. but last week they were getting considerable rosin jack.

QUEEN CITY.—The water has been pumped out of the old Douglass & Holberg mine on the Queen City land, and an engine is being put in at the Galbraith Oldaker & Co.'s shaft. It is expected that the work of getting out the zinc ore, struck at that mine several months ago, will be commenced next week.

W. F. BERRY & CO.—On the Kentucky land W. F. Berry & Co. are getting fine jack from the bottom of the old Perry & Dingman shaft at a depth of 105 ft. and expect to open a large prospect of zinc ore.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The sales of ore were lighter than the week before, due to the low prices and to several of the plants shutting down, also to the hard rainstorm Friday. Top price paid for zinc ore was \$20.50 per ton, with an average of less than \$18 per ton. Last Friday's rain filled up several mines, doing a great deal of damage and the output will be considerable less. The price paid for lead ore was \$16 per thousand with 50c. added for hauling. There is a large amount of lead ore being held for better prices. The following was turned in by the different camps: Joplin zinc, 1,248,360 lbs.; lead, 233,400 lbs.; value \$15,148; Webb City, zinc, 520,960 lbs.; lead, 29,180 lbs.; value \$5,517; Carterville, zinc, 946,260 lbs.; lead, 202,799 lbs.; value, \$12,966; Galena, Kan., zinc, 2,010,000 lbs.; lead, 355,000 lbs.; value, \$23,770; Oronogo lead, 6,000 lbs.; value, \$85. Totals for district: Zinc, 4,725,580 lbs.; lead, 816,370 lbs.; value \$57,486.

ANNA D.—On the Perry lease the Anna D. plant is running steadily on dirt that had been shot down to make a roadbed in their drift for the track when the water was up, and are making 3 tons of zinc ore and 3,000 lbs. of lead each shift. As soon as they get the water a little lower they will take up a 10 ft. slope that is rich in ore.

KANE & CO.—On the Edgar land Kane & Co. are drifting at 160 ft. on a 15-ft. face of lead and zinc ore in open ground and no water. They are producing about 10 tons of zinc ore and 5,000 lbs. of lead each week. Last week they were building a high derrick and putting up a steam hoist so that they could handle more dirt.

MONTANA.

FERGUS COUNTY.

NEW YEAR.—New machinery will be put in this mine soon, and more men will be added to the working force.

GRANITE COUNTY.

GOLDEN SCEPTRE MINING COMPANY.—This company recently purchased 300,000 shares of the Alps mine and 10-stamp gold mill, which is the controlling interest. The purchase was made from John W. Dawson and John W. Opp, of Phillipsburg, the latter being superintendent of the Alps property. George H. Babcock, superintendent of this company, will assume charge. A large force of men will be put at work to once, doing extensive development work.

SOUTHERN CROSS.—This mine, near Georgetown, is being worked by a force of men, who are cross-cutting at 390 ft. The shaft is being retimbered and the mine is receiving a general clean-up.

LEWIS & CLARKE COUNTY.

NINETY-SIX.—William McDermott and associates, who are interested in this mine, are in about 100 ft. on the ore chute and are taking out shipping rock every day. Four men are employed, but the force will be increased in a few weeks if the main body of ore is discovered. One carload of ore netting satisfactory returns has been shipped and a considerable quantity of good ore is on the dump. A small seam of ore was struck in this mine recently that is said to run 50% copper besides some gold, silver and lead.

MADISON COUNTY.

MONITOR.—This mine is shipping ore which gives satisfactory results.

REVENUE.—This mine is being steadily worked with a good force of men.

MISSOULA COUNTY.

HUMBOLDT.—In this mine, which adjoins the Germania, the present operators have just encountered the ledge at a depth of 200 ft. The body of ore is supposed to be a large one and assays well. Shipments to the smelter will begin soon.

SILVER BOW COUNTY.

SNOHOMISH.—This mine adjoining the Rarus on the east has been leased to Messrs. E. Lynch, Jas. Sunderland and Ed. Finnegan. Work has started. A boiler and engine has been secured and the work of removing the water from the 300-ft shaft will be begun at once. By the terms of the lease the lessees will be required to develop it another 100 ft.

NEVADA.

STOREY COUNTY—BRUNSWICK LODGE.

Following are extracts from the latest weekly reports of the superintendents:

BRUNSWICK EXPLORATION COMPANY.—The south drift, which was started from the end of east crosscut No. 1, in the 200-ft. level, has been extended to a total length of 196 ft. The face now shows 3½ ft. of ore of an average value of \$55 per ton. Work has been temporarily discontinued in the face in order that the drift can be enlarged and track laid, so as to facilitate the extracting of this ore. We have extracted and hoisted 25 cars of ore of an average value of \$60 per ton. The north drift from the station has been extended to a total length of 175 ft., face in quartz showing some value. Shaft No. 2.—The north drift has been discontinued and work resumed in the south drift, which was started in the west crosscut No. 1, 45 ft. from main south drift. This drift has been advanced 15 ft. through hard porphyry; total length, 45 ft. Gould & Curry's Company's tunnel.—The main north drift has been extended 18 ft., passing through hard porphyry, clay and quartz; total length 740 ft.

OCCIDENTAL CONSOLIDATED.—In the 750-ft. level, the west crosscut No. 1 on this level has not been extended any during the week. The south drift following the footwall is now in 18 ft. The face is in fair ore. The north drift following the hanging wall of this streak has been advanced 21 ft. The face is in ore assaying \$60 per ton.

STOREY COUNTY—COMSTOCK LODGE.

HALE & NORCROSS MINING COMPANY.—Judge Hebbard handed down another decision on May 12th in the case of M. W. Fox against the Hale & Norcross Mining Company. Before discussing the merits of the case Judge Hebbard briefly reviewed the history of the litigation, and quoted at considerable length the language of the Supreme Court by which he was directed to enter up the judgment for \$210,000. He was reversed for having done so, but the Supreme Court acknowledged that its language had been unhappily chosen.

In his latest decision Judge Hebbard says: "From the conclusion that the Hale & Norcross Mining Company has sustained loss by reason of the imperfect and fraudulent milling of its ores there is no possible escape. Taking the great mass of seemingly conflicting evidence in the case, and calculating from premises strained and enlarged to the utmost in the defendant's favor, the result is still that the Nevada and Mexican mills, controlled by Hayward, Hobart and Levy, did not return to the Hale & Norcross Company the amount of bullion which in common honesty and fair business dealing ought to have been returned. Many witnesses called for defendants testified that 70 to 75% of the battery assay would be a fair return, but this conclusion is arbitrarily given, without regard for car or railroad car sample assays, and independent of the actual value of the ore before it went through the mill. The Court cannot rely upon this class of evidence, founded entirely and absolutely upon battery as-

says, for it is beyond question that the battery sample assays of these ore taken in these mills are incorrect and false and cannot be properly employed as a basis upon which to figure such percentage of returns. From January 1, 1887, to July 1, 1890, assay returns of over 80,000 tons of ore showed in no single month a percentage over or equal to the car sample assays of the same; they were invariably much lower. Considering that all assays are somewhat speculatively and never absolutely exact, the fact that in all this mass of ore there was scarcely a single battery assay that even by chance went higher than the car assays, is startling in its evidence of deliberate, habitual design. The witness D. B. Lyman testified that the Nevada mill was well adapted for the proper reduction of ores, yet its percentage of returns does not compare favorably with those of other mills working Comstock ores, particularly the Brunswick mill, at which Hale & Norcross ores have been worked since this action was commenced with results so much more favorable to the mining company as to absolutely disprove the theory and the evidence that car sample assays must necessarily and always be too high."

After this preliminary discussion of the case the Court proceeded to calculate the losses sustained by imperfect milling. He cited figures showing the value of the Hale & Norcross ore delivered to the Nevada and Mexican mills—which were controlled by Haywards and Hobart—from January 1st, 1887, to July 1st, 1890, and he estimated the value necessarily lost in working, or which would not under fair milling be separated from the baser matter; also, the amount of money, if any, received by the mills from the working or sale of the tailings or residue of the ores and the amount of the bullion that should have been returned by the mills. He obtained the value of the ore delivered to the mills by deducting \$8 per ton from the car-sample assays. He found the value to be \$2,551,742. He declared that the testimony of witnesses on both sides demonstrated that this was the proper method of obtaining the value. He considered the deduction of \$8 a most liberal allowance. "Plaintiff," he said, "contended that a deduction of \$5 would be ample, and the evidence referred to would perhaps warrant an average deduction of but \$5. He found that the value of the ore in working was \$381,769, and after calculating the discount on the percentage of silver in the ore, he obtained a balance of \$417,683, which he declared to be the net deficit, or the amount of damages sustained by the Hale & Norcross Company by reason of the imperfect and fraudulent milling of the ores. This amount, added to the \$210,197.50 which the Supreme Court found to be due by reason of excessive charges, makes a total of \$627,880.50, for which judgment was rendered. It is less than the former judgment on account of the discount on silver. Judge Hebbard says during the course of his decision that counsel for the plaintiff calculated the loss from imperfect and fraudulent milling to be \$651,223, and gave strong reasons in support thereof, but he considered the elements of loss with a view to enter the lowest judgment possible. In conclusion he said: "Nothing is added to the judgment by reason of anything received by the mills from the working or sale of the tailings or residues of the ore. It appears, however, that some \$15,000 was received by the Nevada mill from the workings of concentrates. John W. Mackay, D. B. Lyman and other witnesses testified that in the old days of the Comstock the mining companies required a return from the mills of 65% of the wagon sample assays in bullion; sometimes they received a little more and sometimes a little less, but if less than 65% was returned the mills were called upon to make and did make up the deficiency. In view of this evidence it may be interesting to know that the amount of bullion which ought to have been returned to the Hale & Norcross Company as above found to be \$2,169,973 is about 67% of the ore, \$3,224,286, as valued by the car sample assay, and it is more than \$12.50 per ton less than the average car sample assay per ton of \$38.35." He informed the attorney that he would not sign the decision until he heard argument upon the question whether interest should be added to the \$417,683. Interest runs against the other sum found due by the Supreme Court, and now amounts to over \$40,000. The Court appointed J. J. Groom receiver in the case to collect the judgment, and directed him to pay plaintiff's attorneys 25% thereof.

WHITE PINE COUNTY.

IMPERIAL MINING AND MILLING COMPANY.—This company was incorporated in Salt Lake City lately, says the Salt Lake Herald, under the laws of the new state of Utah, to operate and work the Old Imperial, Jim Blaine, Logan, Butler, Emma and Nellie mines, located in Montgomery canyon, three miles north of the town of Cherry Creek. The Old Imperial mine shows three distinct ledges of ore carrying gold and silver. The mine is worked through a shaft 125 ft. deep. The tunnel, run to the top of the ledge, is now in 600 ft., and a cross-cut run about 300 ft., and by survey measure it has only about 80 ft. more to go before striking the ore chute. The Jim Blaine mine is a contact vein, running north and south, and shows a quartz ledge 105 ft. wide, cropping out the full length of the claim, averaging \$5 per ton in gold, and showing streaks of gold in the vein in places. The tunnel run on the Old Imperial mine will tap this ledge at about 800 ft. in depth. The Logan mine adjoins the Jim Blaine on the north end, and runs on the same

ledge for 150 ft. The Butler, Emma and Nellie mines adjoin these.

NEW MEXICO.

SANTA FE COUNTY.

NEW MEXICO MINING COMPANY.—Newton S. Finney, of New York, who owns 533,000 shares of stocks in this company, applied to the District Court for the appointment of a receiver for his property. The petition is based on the grounds of insolvency, ceasing to do business under its franchise, want of revenue to pay current expenses and taxes, and other grounds. The company was organized years ago by S. B. Elkins, M. Simpson and others. It owns 54,000 acres of the Ortiz mine grant in the southern part of the county. Its capital stock was placed at \$500,000. Its debts amount to about \$80,000. Samuel H. Elkins, of Cerrillos, brother of the Senator, was named as receiver.

SOCORRO COUNTY.

GRAPHIC.—About 100 tons of ore a day from this mine are being treated by the new smelter at Magdalena.

NEW YORK.

ORANGE COUNTY.

FOREST OF DEAN.—The Forest of Dean Mines, four miles south of Highland Falls, owned and operated by the Poughkeepsie Iron Ore Company, have closed permanently. The cause is the exhaustion of the company's territory and its inability to secure a lease on contiguous ground.

PENNSYLVANIA.

BITUMINOUS COAL.

BERWIND-WHITE COAL MINING COMPANY.—A dispatch from Greensburg says that this company will proceed to develop about 600 acres of rich coal lying between Herminie and Cowansburg. The company will sink three or four shafts, giving employment to several hundred men.

MONONGAH.—An explosion of fire damp occurred May 14th, at the face of the workings on the main entry to these mines, opposite Monongahela City. The fire damp caught from a naked lamp. One hundred men were at work and all escaped but two, who, before assistance arrived, were overcome with black damp.

SOUTH DAKOTA.

LAWRENCE COUNTY.

SEABURY-CALKINS.—Four men are at work on this mine, in Carbonate Camp, taking out ore and developing the property. One hundred tons of ore which had accumulated was shipped recently to the smelter. The work of taking out ore will be continued and 6 or 7 tons will be shipped daily.

UTAH.

JUAB COUNTY.

BULLION-BECK AND EUREKA HILL MINING COMPANIES.—In the trespass litigation between these two companies the jury has returned verdicts finding damages in favor of the Bullion-Beck Company in the sum of \$11,236.63, and in favor of the Eureka Hill Company in the sum of \$1,374.19, making net judgment in favor of the former company of \$9,862.54.

SUMMIT COUNTY.

ANCHOR MINING COMPANY.—Manager David Keith reports the work of prospecting is going forward, but stoping has ceased and he is not prepared to say when it will be resumed. The force has been decreased, but forty or fifty men are still employed.

TOOELE COUNTY.

ANDERSON GOLD MINING COMPANY.—This company, recently incorporated under the laws of Nebraska, for the development of a group of six claims in Camp Floyd district, not far from the Mercur mine, has just let a contract to sink and timber a 300-ft. shaft. It is the intention in sinking this shaft to catch the Mercur vein on its dip, and from surveys made it is calculated that this will be done between the 300 and 400-ft. levels. The officers and directors are: A. Anderson, president; George W. E. Dorsey, vice-president; O. T. Roen, treasurer; E. H. Chambers, secretary; A. M. Post, John J. Sullivan and W. A. McAllister.

BILL NYE MINING COMPANY.—At a depth of 22 ft. in the property of this company material from which gold of the value of \$1.80 a ton, it is reported, has been obtained. The property consists of 17 claims situated between those of the Camp Floyd Mining Company and the Bohn shaft, which is being sunk in Fairfield Flat.

ELDORADO GOLD MINING COMPANY.—About one mile west of the Mercur mine there is a group of claims on which systematic development work has been done and which is owned by this company. An ore body assaying in different parts of the vein, \$4, \$8 and up to \$21 in gold was discovered in January last, but was not made known owing to negotiations which were being made for the purchase of a fractional interest. This purchase was completed last week. This company is controlled by a few Salt Lake and Mercur parties, the directors being Frank E. Wilkinson, Goodwin & Van Pelt, E. L. Colborn, J. J. Rogers, E. B. Shoebridge and John Scarborough.

GEYSER MINING COMPANY.—The annual meeting of stockholders of this company was held at Salt Lake City last week, 189,200 shares being represented. The following Board of Directors was elected: S. B. Milner, M. T. Gisborn, R. E. McConaughty, Ed. Airis and Glen R. Bothwell. Mr.

Bothwell was then elected president, M. T. Gisborn vice-president, and S. B. Milner secretary and treasurer. There were no reports submitted to the stockholders concerning the operations of the company during the year, President Bothwell pleading that the fact that a meeting of stockholders was due had been overlooked until it was too late to compile them. In an oral report, however, the president said that the property was in good condition at present, and that were it free from legal entanglements the output would be much greater. G. A. Duncan, who recently made a tender of \$65,000 through W. C. Hall, to the officers of the Geyser and demanded the transfer of the property in his favor under an old contract with Gisborn, has followed it up with a suit for possession. Mr. Gisborn denies that Duncan has any claim whatever upon the ground in question, the petitioner, he explains, having failed to make a certain payment when it became due under the terms of the agreement by which a deed was placed in escrow. However, the deed continues in the vault at Walker Brothers' bank. Mr. Gisborn, when asked why it had not been released, stated that one of the conditions was that both parties must be present, and that he had never been able to get Duncan on the ground.

GOLDEN GATE EXTENSION.—The shaft house on this property is nearly completed and the two-compartment shaft is already down 35 ft. A contract has been let for 400 ft. of sinking.

VIRGINIA.

CHESTERFIELD COUNTY.

MIDLOTHIAN.—This coal mine, twenty-five miles from Richmond, took fire last week. There were 11 miners in the Grove shaft—which is 600 feet deep—at the time, but all were rescued. All the buildings over the shaft were destroyed.

WYOMING.

ALBANY COUNTY.

(From Our Special Correspondent.)

ALBANY PLACER MINING COMPANY.—The force of men on this company's ground has been engaged for the past 10 days in shoveling snow from the bed-rock and ditches and in placing the iron piping in position for hydraulic working. The snow which has covered the ground all winter on the bar, where the first piping will be done, has protected it from frost and the company will have little trouble from this source the present season. Water is beginning to flow freely from the gulches and the indications now are that operations will commence within a few days.

BIG LARAMIE.—Parties returned this week from the Big Laramie, where they had been for the purpose of locating claims on the new find made last week. Samples of the ore brought in from there are similar to the Portland ores of Cripple Creek. The ore body is in a granite formation. A vein of copper ore was also discovered and located. The ore body is 6 ft. wide, showing a pay streak of about 18 in.

DOUGLAS CREEK.—All the claims on the eastern slope of the district are doing good work and Douglas Creek will make a good record this season.

LAKE VIEW COAL COMPANY.—This company, six miles north of Laramie, is pushing its tunnel and expects to have coal ready for the market July 1st. The vein is 6 ft. wide, with a sandstone covering about 40 ft. thick.

SPRING CREEK PLACERS.—On Spring Creek pipping has been in operation the past week and indications point to a good clean-up in the fall. The beaver workings covering the ground were badly frozen at first, but the past few days of sunshine have taken the frost out and work is progressing on the bar in good shape.

WYOMING RANGE GOLD COMPANY.—C. S. Crysler, vice-president and manager of this company, will at once visit the Richmond, Virginias, Chicago and Smuggler mines, also his Independence placer property, for the purpose of making a thorough examination. Should this examination prove satisfactory active operations will commence at once on a large scale.

CARBON COUNTY.

(From Our Special Correspondent.)

CARBON COUNTY MINING AND MILLING COMPANY.—This company, which is running a tunnel to intersect the shaft, reports that when in 215 ft. an ore body with a well-defined wall and heavy gouge was encountered. The officers state that they are now in 50 ft. on this ore body and assays made by Professor Knight of the State University give \$18.50 gold and 2½% copper to the ton. They further state that the ore in the tunnel is similar in every respect to that found in the bottom of the shaft. The company has arranged to ship a car of ore, to be taken from the Albion, Croesus and Emma G. mines, to Denver, to be treated, for the purpose of ascertaining the proper machinery to be used in its reduction, preparatory to the erection of a plant at the works.

FLORENCE.—The owners of the Florence mine in La Plata district have two carloads of ore on the dump ready for shipment as soon as the roads will permit. At the surface, it is said, the pay streak was 10 in.; at 40 ft. it has increased to 48 in. and is between a contact of lime and porphyry. It is said that assays made on the average of the ore body give 3.7 and 11 oz. of gold, respectively, as depth was attained. The ore is of a refractory character.

CONVERSE COUNTY.

(From Our Special Correspondent.)

BUFFALO.—Two stamp mills for the reduction of ore have reached Buffalo. One was sent to the claim of the Crazy Woman Milling Company and the other will be put up at Buffalo for general custom work. General Manager Holdredge, of the Burlington railway system, has an expert at the Kelly Creek mines, near Buffalo, investigating the quality and extent of the ore. Professor Boyd, of Sheridan, will have a test mill run of the ore made under his personal supervision.

LARAMIE COUNTY.

(From Our Special Correspondent.)

GRANITE CANON.—Assays made from three different mines at Granite Canon give respectively \$14, \$40 and \$71 gold per ton, and there is much excitement over the result. It is claimed that the ore can be easily treated.

JOHNSON CREEK GOLD MINING AND MILLING COMPANY.—Articles of incorporation were filed with the Secretary of State by this company. The capital stock of the company is placed at \$1,000,000.

SHERIDAN COUNTY.

(From Our Special Correspondent.)

The tin properties on the Piney are being investigated by a number of Eastern capitalists. The assays which were recently made are said to have given satisfactory results and considerable prospecting work is being done in that locality.

FOREIGN MINING NEWS.

CANADA.

BRITISH COLUMBIA.

(From an Occasional Correspondent.)

BRITISH COLUMBIA SMELTING AND REFINING COMPANY.—This company's works at Trail consist of four reverberatories, modelled after the most approved Butte type, two blast furnaces, roasting plant for same, and sampling works of the capacity of 250 tons a day. The company has a contract with the Le Roi mine for the treatment of 75,000 tons of ore. Since October 1st practically all the product of the Le Roi Mining and Smelting Company, of Spokane, Wash., with mines at Rosslund, has been delivered to the smelter or stored at the mine for account of the smelting company. Approximately 7,000 tons were delivered at the smelter by teams, and about the same quantity is now ready on the dumps at the mine, awaiting the completion of the first division of the Columbia & Western Railway, the construction of which was started last December as the Trail Creek Tramway Company. The smelting company intends to purchase whatever ores are offered from that district, and that due to the close alliance between the Columbia & Western Railway, which is at present or will be before the end of this month the only railroad into the mining camp, expects to reduce a large part of the ores of that vicinity. The shipments from the Le Roi Company are averaging about 1 oz. in gold, 1% to 2% in copper, and 1 to 2 oz in silver. It is difficult to make any definite forecast of the weekly or monthly shipments of bullion or matte. At the present time the smelter is in condition only to produce matte, which has been ranging from 25% to 35% in copper. Temporarily this product is being handled by the Montana Ore Purchasing Company, of Butte, Mont.

LATE NEWS.

The Brown Hoisting and Conveying Machine Company, of Cleveland, O., through their New York office, have just closed a contract with the Pennsylvania Railroad for one Brown patent rapid double cantilever machine for handling general merchandise on their Pier J, Jersey City, to and from ocean steamers, to cars. This machine has been designed especially for Pier J, and will be the first special machine for the rapid handling of freight ever erected in New York Harbor. It will hoist its full load of 5 tons 150 ft. per minute, and trolley same 900 ft. per minute, while the entire machine will move along the pier 600 ft. per minute. It is operated by steam, and will be handled in every function by a single operator. The engines, boilers and operating mechanism are contained in a house 21 ft. square on top of the machine. An attachment for handling bulk material such as sand, sulphur, pyrites, etc., and loading same into box cars, will be provided, and it is expected this machine will revolutionize the handling of ocean freight in New York harbor. It will be in operation about September.

(Special to the *Engineering and Mining Journal*.)
CRIPPLE CREEK, Colo., May 22d, 1896 (By Telegraph).—The Golden Crater mine resumed work on May 20th under new management.

Mr. John Griffin, receiver of the Industrial and Mining Guaranty Company, has issued a letter to the creditors and stockholders of the company asking them to attend a meeting at his office in the Fuller Building, Jersey City, N. J., on May 25th. At this meeting he will lay before the creditors and stockholders the status of affairs, and ask their judgment as to the best course to pursue with regard to a suit pending in Arizona for the recovery of certain mining properties in which the Industrial

& Mining Guaranty Company may have some equities. The result of this meeting he will probably report to the Chancellor and ask his direction as to the course to be pursued.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 22.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending May 16th, 1896, compared with the corresponding period last year:

	1896.		1895.
	Week.	Year.	
Pennsylvania Railroad.....	54,245	1,283,968	1,461,131

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending May 16th, and for years from January 1st, 1890 and 1895:

	1896.		1895.
	Week.	Year.	
Shipped East and North:			
Allegheny, Pa.....	36,595	910,851	1,565,782
Barclay, Pa.....	880	18,887
Beech Creek, Pa.....	58,432	1,205,354	1,144,922
Broad Top, Pa.....	6,584	171,484	352,831
Clearfield, Pa.....	68,242	1,819,796	4,316,706
Cumberland, Md.....	166,323	1,674,172	2,196,299
Kanawha, W. Va.....	75,404	1,225,971	2,328,098
Phila. & Erie.....	450	25,600	47,211
Pocahontas Flat Top.....	88,391	1,466,917	1,351,318
Totals.....	401,201	7,938,012	13,363,167

† Week ending May 9th.

	1896.		1895.
	Week.	Year.	
Shipped West:			
Monongahela, Pa.....	26,678	384,258	696,529
Pittsburg, Pa.....	33,231	738,811	1,504,585
Westmoreland, Pa.....	42,075	796,072	1,640,392
Totals.....	101,984	1,919,141	3,821,416

Grand totals..... 503,185 9,857,153 17,124,583

Production of coke on line of Pennsylvania Railroad for the week ending May 16th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 81,367 tons; year, 1,744,635; to corresponding date in 1895, 2,138,943 tons.

Anthracite.

The conditions now prevailing in this market are indicative of an improvement in both the demand and prices of coal. Some new business was transacted during the past week at the May circular. The orders which were secured prior to the May advance are being worked off gradually, and it is the general belief that they will be cleared up by July 1st. There is still some stocking of coal in the West. The Eastern trade is very quiet, although there are a few orders in the market for the smaller sizes of coal.

There has been some talk of a further increase in the circular of July 1st, and many persons in the trade affect to believe that such will be done. It is understood, however, that some very prominent interests oppose further advance on various grounds. The present circular has not obtained freely yet and it is useless to talk of what coal may fetch six weeks hence. One thing is certain, that combination or no combination, an increase in the price of coal on July 1st will be a very impolitic action.

Current f. o. b. prices are \$4 for stove, \$3.75 for egg and chestnut and \$3.50 for broken, subject to the usual commission of 15c.

NOTES OF THE WEEK.

It is announced that the Dominion Coal Company closed a contract recently with the Canadian Pacific road for 140,000 tons of Nova Scotia coal. This is an increase of 40,000 tons over last year's order. The company has also closed a contract with the Grand Trunk Railway Company for the delivery of 100,000 tons of Nova Scotia coal at Montreal and 30,000 tons at Portland, Me. This is an increase of 70,000 tons over last year's order.

Bituminous.

There is a slight improvement in the soft coal market over last week. A few more orders are being received by producers for prompt shipment, and owing to the difficulty of getting ocean tonnage to transport the coal from the loading to the unloading ports there is a slight accumulation of orders in hand. The demand still comes principally from the far east, though the Sound trade is picking up somewhat. New York harbor shipments are steady. It is believed that this improvement is indicative of the conclusion arrived at by the consumers that the "combination" figures have come to stay. There are less rumors about disagreements among the members of the association, and as this disturbing factor is eliminated the orders come in in larger quantities. Trade local to the shipping ports is very dull as yet.

There is some inquiry for South American business, but only a small amount is being done, which is controlled to a great extent by the high ocean freights for this class of trade.

The all-rail trade shows very little change; it is steady in character and fair in amount. It is apparent that this business has accepted the association prices with less murmuring than any of the other lines of trade.

In the affairs of the association the only change to report would be for the better. There is an inclination among the members of this combination that whenever any one of them has any grievance in mind it is made known by him at the meeting, and the parties accused can then refute or explain the matter.

Transportation from mines to tide is fairly good. There is comparatively little coal on the way to tide; indeed, some companies are considering increasing their shipments to take care of the orders that continue to come in. Most companies, however, have a moderate supply of coal in cars standing at tidewater to take care of any charters that they may be able to make on orders in hand. The car supply is ample for all needs, owing to the light demand.

In the coastwise freight market vessels are in poor supply. Rates are strong and have continued at the present figures for a longer time than was thought by the trade. We quote current rates of freight as follows from Philadelphia to Boston, Salem, Portland, Bath, Gardiner and Bangor, 65¢@70¢, with additional towage to Gardiner; Providence, New Bedford, New Haven and other Sound ports, 60¢@65¢; Wareham, 30¢; Lynn, 75¢@90¢; Newburyport, 75¢@80¢; Portsmouth, 70¢; Dover, \$1.10c. and towage; Saco, 90c. and towage; Pawtucket, 80¢@85c. and towage. Five and ten cents above these rates are asked for the lower shipping ports.

Buffalo, N. Y.

May 21,

(From Our Special Correspondent.)

Quotations for anthracite and bituminous coal are unchanged. Trade in the former is very light as consumers anticipate reduction in prices and do not care to lay in supplies or bargain for next fall and winter consumption. The business in the latter is confined to the immediate requirements of manufacturers, as they do not seem to think that prices will be higher, and take the risks of a rise. Supply of anthracite and bituminous fully adequate to all requirements.

Engagements of coal for freight by lake is small in volume; tonnage is asked for, but there is little on the market. A vessel agent says: "There is an ample quantity for several vessels but no boats to go."

Trade in anthracite coal at other important centers is reported to be very dull for new contracts, although there is a considerable movement in filling April orders, which were given in the anticipation that prices would be higher in May. The produce and carrying companies continue to work in close harmony both as regards output and maintenance of quotations.

Lake freights on coal firm, with an advance since last week of 10c. to Chicago and 5c. to Milwaukee and Racine. The shipments of coal westward by lake from May 11th to 16th, both days inclusive, aggregated 51,000 net tons, distributed as follows: 21,920 tons to Chicago, 15,350 tons to Milwaukee, 6,050 tons to Duluth, 4,000 tons to Superior, 1,500 tons to East Saginaw, 600 tons to Bay City, 1,400 tons to Manitowoc, and 600 tons to Gladstone. Closing firm and steady. The rates of freight were 50c. to Chicago, 40¢@45c. to Milwaukee, 25c. to Duluth, Ashland, Gladstone and Superior; 30c. to Bay City, 35c. to East Saginaw, 50c. to Racine, 45c. to Manitowoc, and 40c. to Alpena.

It is gratifying to note that the Erie Canal is doing a good business thus far this year, with remunerative rates of freight for the boatmen.

Chicago.

May 20,

(From Our Special Correspondent.)

Anthracite.—Business continues light in anthracite coal, but dealers are now pretty well inured to the poor business conditions, having had a couple of years of it. Generally the market has improved a little with the week, and there is some inquiry. Retail prices on hard coal have been made for the season, and are \$6 for large egg, and \$6.25 for small egg.

Bituminous.—Soft coal is being sold in small quantities only, and the aggregate sales of the week foot up a light total. Warm weather has hindered the trade, and manufacturing concerns are not buying as much as expected, showing that conditions with them are not up to expectations.

Coke.—At present coke is being bought only in a limited way.

Pittsburg.

May 21.

(From Our Special Correspondent.)

Coal.—Trade since our latest has not been very active, as there is not sufficient water in the Ohio for coal boats. A large number of empties have arrived and been forwarded to the pools; this will keep the miners busy for some time. If there is no further rise this month we may confidently expect the June rise to be on hand on time. This year's run so far is considerably in excess of last year during the same time; there is sufficient coal loaded for another run and all that is wanted is a good stage of water. The railroad coal trade in connection with the lake shipping business continues quiet; operators contend that the railroads will have to reduce the freight rates to the lake ports so as to enable them to compete with Illinois coal, which is put on the Northwestern markets, \$2 cheaper than Pittsburg coal.

Officers of the Miners' Union were much provoked by reports of strikes at four mines which were not authorized. The miners were ordered to return to work immediately, and were notified that no attention would be paid to their grievances until they did. This is in conformity with the annual wage scale which provides for the creation of the committee of 16 to which all grievances shall be submitted and which also forbids all cessation of work pending the adjustment of difficulties.

Connellsville Coke.—There was a slight increase in coke shipments and operators report good prospects for better trade. Last week the demand for

Pittsburg and the West increased 235 cars, but there was a falling off in Eastern shipments of 213 cars, which reduced the increase to 22 cars.

In the Dunbar district the coke trade has changed very little for two months. The Wheeler and Morrell plants of the Cambria Iron Company are in full operation, while the Mahoning and Atlas mines of the same company are closed out indefinitely. The Acheson Coke Company's Anchor works have been abandoned for want of coal. Reid Brothers' Uniondale plant is resuming gradually as the old ovens are being put in repair. The Furgeson and Hill Farm works are running full. There are indications of an improvement in the near future.

W. I. Rainey is erecting 150 ovens to reinforce his Mount Braddock plant; he is also building 50 ovens more at the new Elm Grove Works, and 30 new ovens at Meyers. A summary shows 11,654 ovens in blast, and 6,293 idle; production, 111,991 tons; week's increase, 524 tons; the average days worked were 5.37, against 5.29 days the previous week; in all, 4,661 ovens made six days; 6,868 ovens made five days, and 125 ovens made four days. The shipments for the week amounted to 6,834 cars distributed as follows: To Pittsburg, 2,306 cars; to points west of Pittsburg, 3,811; to points east of Pittsburg, 817 cars.

Prices are reported unchanged.

A charter has been granted to the Pittsburg Gas and Coke Company, of Philadelphia; capital, \$30,000. The stockholders are William L. Elkins, Jr., Thomas D. Finletter, George T. Beans, Walter Cox and Arthur B. Eaton, all of Philadelphia.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 22, 1896.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	May 21, 1895.	May 22, 1896.	Jan., '95.	Jan., '96.	Jan., '95.	Jan., '96.
Anthracite.	35	20,876	42	21,910	434,402	601,328
Coke.	121	130,794	138	172,480	2,852,246	3,455,319
Charcoal.	19	4,250	15	5,230	89,468	106,530
Totals	175	155,920	195	199,620	3,376,116	4,166,177

The iron market obstinately refuses to be stimulated and remains everywhere in an exceedingly dull condition. The artificial raising of prices still proves a failure, and there are no present signs of improvement. So long as the trade is ridden to death by combinations and general business is depressed by the currency uncertainty, we must expect the present lethargy to continue.

Comment on prices has been again stirred up this week by the notices of shipments of steel rails to Japan by the Illinois Steel Company; and also of a shipment of 650,000 lbs. of rails from Cleveland to the same country. It is well understood that these orders are taken at prices much below those fixed by the various combinations for home use.

The Amalgamated Association of Iron and Steel Workers begins its yearly convention in Detroit this week, and it will probably continue in session all through next week. The Wages Committee has recommended some important changes in the puddling and tin-plate scales, and a general readjustment is expected, which will require much discussion.

NOTES OF THE WEEK.

The Poughkeepsie Iron Ore Company has closed down its Forest of Dean mine, near Highland Falls, N. Y., and work will not be resumed there, as the company's tract is practically exhausted. A proposition to lease an adjoining tract was not accepted by the owner.

The contract for armor-plates for the new battleships *Kearsage* and *Kentucky* has been divided by the Secretary of the Navy. The Carnegie Steel Company gets the order for 3,007 tons, at a total price of \$1,660,518, and the Bethlehem Iron Company 2,653 tons for \$1,460,132. The total to be paid for 5,660 tons is \$3,120,710, an average of \$551 per ton.

The Johnson Company is offering \$2,000,000 in 6% gold bonds having 20 years to run, secured by mortgage on its steel works and other property at Johnstown, Pa., and Lorain, O. A statement by the company gives the cost of the Johnstown property at \$1,401,615, and of the Lorain plant at \$3,307,466. For the year 1895 the company's profits were \$578,373, from which there was paid \$102,032 for interest, leaving a net surplus of \$476,341 for the year. In 1894 the net profit was \$268,001.

An article lately published by P. G. Shook, Vice President of the Tennessee Coal, Iron and Railway Company, is interesting as giving practically that company's reasons for establishing a steel plant at Birmingham. He points out—as the *Engineering and Mining Journal* has done on several occasions—the great advantage to the Alabama iron men of having a market close by where their raw iron can be converted into steel, thus saving a large part of the profit which now goes to the railroads as freight. The company purposes using the basic open-hearth process.

New York. May 22.

The local market is in unpromising shape, and in dealers' offices there is more spare time than is at

all desirable or welcome. Even in structural iron there is some hesitation, and buyers are inclined to hold off a little, partly in hopes of lower prices and partly because of the financial uncertainty. We hear of plans for one large building which have been laid aside for a year because of hesitation in negotiating a loan—on a very good property—and other projects are said to be in the same condition. The possibility of a strike is also discouraging business. The same difficulty is delaying the beginning of some good electrical work, which was expected to be under way before this.

Pig Iron.—Every one is talking of the big business to be done in July, but meantime only small orders are visible, and a 500-ton purchase would excite the market. The selling agents all protest that they are maintaining prices; but these protestations are a little eager, and there is a well-founded suspicion that a sharp buyer would not have to go far to find good iron just a little below the figures quoted. Nominally there is no change, but the pressure to sell is increasing to a point where a good contract would be an irresistible temptation.

With this reservation, we continue to quote for Northern iron as follows: No. 1 foundry, \$12.75@13.25; No. 2 foundry, \$12@12.50; gray forge, \$11.25@11.75. For Southern irons we quote: No. 1 foundry, \$11.75@12.25; No. 2 foundry, \$11.25@11.75; No. 1 soft, \$11.25@11.75; No. 2 soft, \$11@11.50; forge, \$10@10.50. All prices are for tide-water delivery.

Cast Iron Pipe.—Makers are not looking for contracts and no new business is reported this week. The foundries are all supplied with work for the present.

Spiegeleisen and Ferro-Manganese.—Sales have been small, and quotations are unchanged at \$19.50@20.50 for imported spiegeleisen and \$47@47.50 for ferro.

Steel Billets and Rods.—There has been hardly enough business to make a price, and we quote nominally the pool price, which is \$21.75 per ton for New York delivery. Rods are quoted nominally \$27, with light sales.

Merchant Iron and Steel.—The sales this week have been very light; there are no large orders and small ones are growing fewer. Another week of such business will see prices reduced. They are still maintained, but brokers are getting anxious for business. We hear nothing more of an advance in bars. We quote for common bars, 1.15@1.25c.; refined bars, 1.25@1.50c.; soft steel bars, 1.35@1.45c. Other quotations are: Steel hoops, 1.50@1.60c.; steel axes, 1.65@1.80c.; links and pins, 1.65@1.75c.; tire steel, 1.85@2c.; spring steel, 2.05@2.20c. Open hearth machinery steel is 1.45@1.60c.

Plates.—There is not much doing, and prices are unchanged. We quote for universal mill plates, 1.45@1.55c. Other quotations are: Tank, 1.45@1.55c.; boiler shell, 1.55@1.65c.; good flange, 1.80@1.90c.; firebox, 2.10@2.50c. Charcoal iron plates are 2.25c. for shell, 2.75c. for flange, and 3.25c. for firebox. Rivets are 3/8@3.25c. for best iron and 2.15@2.25c. for steel.

Structural Iron and Steel.—While this continues to be the most active section of the market, there is some uncertainty, and two or three large contracts are in suspense, pending financial negotiations. At present we must report prices unchanged. We quote for angles, 1.45@1.55c.; channels, 1.60@1.75c.; tees, 1.65@1.75c.; beams (up to 15-in.), 1.70@1.80c. for large lots and 2@2.20c. for small orders.

Steel Rails and Rail Fastenings.—The market here is perfectly quiet, and no sales have been made. Steel rails are quoted at \$28.75 per ton at tidewater for standard sections; girder rails at \$29@32 at tidewater.

Rail fastenings are quiet. Fish and angle-plates, 1.25@1.35c.; spikes, 1.65@1.70c.; bolts, 1.90@2.05c. for square nuts, and 2.05@2.15c. for hexagon nuts. Prices for bolts are provisional, pending the orders of the new combine.

Scrap Iron.—Demand for cast scrap is light, and there is little doing. Careful buyers can pick up good lots at lower prices than for a year past. We quote about \$10@11.50 for good machinery scrap; \$9@10 for ordinary cast scrap, and \$6@7.50 for stove-plate and mixed.

Buffalo, N. Y. May 20.

(Special Report of Rogers, Brown & Co.)

The market during the past week has shown a trifle more life, but the orders are of the carload and 100-ton variety. However, as they are for immediate shipment and the consumer in a hurry for the iron, it indicates that stocks of foundry iron on hand in consumers' yards are light. If anything, the lines seem more closely drawn between the consumer and producer in that many furnaces are nearing the end of their stock of ore purchased last year and must figure their cost on a higher basis. We quote on cash basis f. o. b. cars Buffalo as follows: No. 1 foundry, strong coke iron, Lake Superior ore, \$13.50; No. 2 foundry, strong coke iron, Lake Superior ore, \$13; Ohio strong softener No. 1, \$13.50@14; Ohio strong softener No. 2, \$13@13.50; Jackson County silvery No. 1, \$15.25@15.50; Southern soft No. 1, \$12.40; Southern soft No. 2, \$11.90; Hanging Rock charcoal, \$18; Lake Superior charcoal, \$14@14.50.

Chicago. May 20.

(From Our Special Correspondent.)

There has been but little change in the condition of the Chicago iron market, the buying in all lines

continuing moderate. It is not expected that there will be any great change in the situation for a month or so to come, and there are those who say that we will not have an improved market until after election.

Pig Iron.—Neither Northern nor Southern pig iron sold in anything but limited amounts during the week just passed, and total sales would foot up only a few thousand tons. There is but little possibility of prices being maintained, and a few more weeks of depressed business will pull them down. The demand is not confined to any one class of iron, but is distributed among all. We quote Lake Superior charcoal, \$13.50@14; local coke foundry No. 1, \$12.25@12.50; local coke foundry No. 2, \$11.75@12; local coke foundry No. 3, \$11@11.50; Southern coke, No. 1, \$12.10@12.35; Southern coke, No. 2, \$11.60@11.85; Southern coke No. 3, \$11.10@11.60; Southern, No. 1, soft \$11.60@11.85; Southern No. 2, soft, \$11.35@11.60; Jackson County silveries, \$14.50@16; Ohio strong softeners \$15@15.50; Alabama car-wheel, \$16.85@17.35.

Structural Material.—The market conditions continue very poor, there being but a very small business. Bridge material is being placed in small quantities. Prices are as follows: Beams and channels, 1.65@1.70c.; angles, 1.45@1.50c.; plates, 1.50@1.55c.; tees, 1.65@1.70c. Small lots from stock are quoted 1/4c. to 1/2c. higher.

Billets and Rods.—The week has shown no improvement in either billets or rods, a few small sales in each representing the trade done. Billets are quoted \$21.25 and rods \$20.50.

Bar Iron.—There has been no business in bars to speak of during the week. Inquiry is limited and outside of a few purchases by the agricultural implement makers there is nothing doing. Bars are quoted, for common, 1.30@1.35c.; for refined 1.35@1.40c.

Steel Rails.—There are no sales of steel rails reported in this market for the week. Business is very quiet and likely to remain so from present indications. Rails are quoted \$29, Chicago.

Old Rails and Wheels.—No sales of importance are observed in either old iron rails or wheels. Quotations are for old iron rails \$15.50, and for old wheels \$13.50.

Cleveland, O. May 21.

(From Our Special Correspondent.)

Iron Ore.—Sales of Bessemer ore during the past week have been in small lots of 10,000 to 30,000 tons. The orders come from scattered sources and do not represent any general buying movement. The large interest concentrated in the Pittsburg district are still unsupplied, and their policy appears to be to defer up to the last moment practicable the necessary purchases. It is probable that needs can then be more accurately gauged than now, and there may also be an expectation that the prices of ore may weaken. But there cannot now be discovered any indications that the ore shippers will in any way modify the schedules adopted this spring.

During the week there has been a slump in the vessel rates from Escanaba and Marquette. Tonnage can now be obtained from Escanaba at 55c., against 70c. a week ago. The drop is due to the weakness of the grain rate at Chicago. The Marquette ore rate has fallen in sympathy with Escanaba from 90 to 80c. The wild rate from the head of the lakes remains unshaken at \$1. There is a fair demand for tonnage, but the ore dealers are said to be confining the movement principally to the actual sales made, and not bringing down much, if any, unsold ore.

Pig Iron.—There have been scarcely enough sales this week to establish prices, and quotations are nominal. Buyers appear to be off somewhere on a vacation. With ore and coke prices maintained at \$4 and \$2 respectively, makers of iron cannot see how the prices for pig can weaken. The logic of cost is on their side and the stronger manufacturers are not offering products under present conditions.

Bessemer pig is nominally quoted at \$12.75 Cleveland, but one or two small sales have been reported on a slightly lower basis, about \$12.55. Ohio Scotch is quoted \$13.25 for No. 1 and \$12.75 No. 2; Northern strong at \$12.75 and \$12.25, but actual sales in foundry irons are lacking. Lake Superior charcoal pig is in good demand, and the sales of some furnaces are entirely satisfactory. They are made on a basis of \$13.50@14, Lake Erie ports, and the product is going largely to Eastern malleable concerns.

Pittsburg. May 21.

(From Our Special Correspondent.)

Raw Iron and Steel.—Business conditions during the first part of the week were dull, prices weak and unsatisfactory; the outlook was decidedly gloomy. There was a want of confidence generally; the opinion seemed current that this condition would probably continue until the platforms of the political conventions shall have been definitely formulated. Up to this time the iron and steel trade was dull; prices very uncertain, with a demand confined altogether to the current wants of the local trade at prices that ruled the preceding week. Stocks are large and steadily accumulating. We are producing at the rate of 10,000,000 tons of pig iron a year and the consumption is nothing like as great, and the trade cannot be very buoyant under such conditions. The month of May seems to be a favorable one for the iron and steel trade to improve. In 1895 the first upward movement in values was inaugurated the second week in May, and continued until late in the fall.

The production of pig iron is too large and must be reduced. The question is what furnaces will shut down. In 1895, May 1st, the weekly production was 155,920 tons; in 1896, May 1st, it was 199,620 tons, showing a weekly rate of 43,700 tons in excess of last year. The weekly sales of Bessemer pig iron in April, 1895, aggregated 175,550 tons; sales for April, 1896, were only 94,350 tons, which shows a falling off amounting to 81,200 tons. These figures describe the situation and prove beyond question, that we are making entirely too much iron and consuming too little, so that stocks are rapidly increasing.

Steel made by the Bessemer process from Bessemer pig iron is controlled by the steel combination; open-hearth acid and open-hearth basic made by open-hearth process from steel scrap and common grades of pig iron is not controlled by the combination. This is worth noting.

Latest.—Within the past 48 hours there has been a larger demand for Bessemer pig, with some of the heaviest sales of the year. Consumers have evidently made up their minds that the time has arrived to purchase. We can report sales of 20,000 tons Bessemer pig deliverable from June to December, inclusive, at Valley furnace \$12.40@12.50. Other large sales are pending and may be closed at any time. Steel billets show no change, prices ranging \$13.50@20.25.

COKE SMELTED, LAKE AND NATIVE ORE.		Tons.	Cash.
10,000 Bessemer, June to Jan, Valley, \$12.40	2,000 Billets, May, June and July, at mill.....	20.25	
6,000 Bessemer, June to Dec., Valley, 12.45	1,000 Billets, May and June, at mill.....	19.60	
3,000 Bessemer, May, June, and July Pits,.....	800 Billets, May and June, at mill.....	19.75	
2,000 Bessemer, June, July, Pits,.....	700 Billets, May and June, at mill.....	19.50	
1,000 Gray Forge, June, July, Pits,.....	500 Billets, May and June, at mill.....	19.80	
1,000 Off Bessemer, May, June, Pits, 12.00	SKELP IRON.		
500 Mill iron, June, Pits,.....	200 Wide grooved, Pits,.....	\$1.30 4 m.	
500 No. 2 Foundry, prompt, Pits, 12.40	600 Narrow grooved, Pits,.....	1.30 4 m.	
300 Bessemer, spot, Pits,.....	500 Sheared, Pits, 1.50 4 m.		
250 No. 2 Foundry, Pits,.....	SKELP STEEL.		
128 No. 1 Foundry, May, Pits,.....	500 Wide grooved, Pits,.....	\$1.20 4 m.	
100 Mill iron, May, Pits,.....	380 Narrow grooved, Pits,.....	1.20 4 m.	
106 No. 2 Foundry, May, Pits,.....	340 Sheared, Pits, 1.40 4 m.		
50 Silvery No. 2, Pits,.....	MUCK BAR.		
CHARCOAL.	1,000 Neutral, delivered, Pits,.....	\$21.00	
100 No. 2 Foundry, Pits,.....	200 Neutral, Pits,.....	20.50	
50 No. 2 Warm Blast, Pits,.....	STEEL WIRE RODS.		
50 Cold Blast, Pits, 23.50	500 At mill, Pits,.....	\$28.00	
50 No. 1 Foundry, Pits,.....	SHEET BARS.		
BLOOMS, BILLETS AND SLABS AT MILL.	1,000 Delivered, Pits,.....	\$22.25	
3,000 Billets, June, July and Aug., at mill.....	BLOOMS, BILLETS, BAR ENDS.		
	1,000 Bloom and billet ends, Pits,.....	\$14.5	

Philadelphia, May 22.

(From Our Special Correspondent.)

Pig Iron.—The amount of business done since Monday morning has fallen below last week. Prices are about the same. Consumption might be a little larger in foundry iron and a little less in forge. There is hardly any margin in iron at this time and makers are not doing anything to stimulate business. Brokers, salesmen and others hereabouts deal in bright expectations for the future, that is after July 1st, and they are now trying to pin consumers down to certain conditional arrangements that may result in business. Our people will not make any promises; there is too much iron in the furnace yards. Southern irons are offered at a fraction less. In short, we are all waiting. No. 1 Standard Foundry is \$12.50 delivered; No. 2, \$12; Forge, \$10.75@11.

Steel Billets.—Business is sought for by Western parties at \$21.50, but there is no disposition to do business at any price.

Merchant Bars.—There is some little movement in steel bars and high grade steel, and certain makers here think a large business will soon be done in car-building iron, even though the trade generally has no information as to any new car-building orders. Store sales continue at the usual figures.

Sheet.—The stocks on hand will soon disappear, and orders are quite brisk. Prices for quick deliveries are fractionally stronger, but in large quantities prices are perhaps no higher than they have been. A good deal of common stuff is likely to be ordered soon.

Pipes and Tubes.—To-day's statements point to an unusually active half year. Every day brings some additional business, but there is no firmness in prices as yet.

Merchant Steel.—For all kinds there is fair inquiry, but the mill capacity is far from crowded, and manufacturers complain of the difficulty they encountered in restoring margins to reasonable limits.

Plate Iron.—The business which two months ago appeared very sure for May is now apparently as far off as ever. Manufacturers say there is enough work mapped out, to keep every furnace hot, and

they take a cheerful view of the future. Mills have very little work on their books. Tank plates are about 1'45; universals, 1'50; shell, 1'60; flange, 1'65; fire-box, 1'80.

Structural Material.—Considerable additional business from local service has been finally and squarely placed on the books, and mills are again in good humor. There are other jobs of lots running into a few hundred tons each, yet to come. Angles are 1'45; beams, 1'60@1'90.

Steel Rails.—Small orders are still the rule and \$28 is given as the regular price for standard sections at mill.

Old Rails.—Prices, \$14.50@15.

Scrap.—Old axles would bring about \$17 and car wheels \$13. Heavy steel scrap is worth about \$13. Choice railroad is scarce as to offerings, though buyers would find perhaps all they wanted if they would pay \$14 per ton.

METAL MARKET.

NEW YORK, Friday Evening, May 22, 1896.

Gold and Silver.

Prices of Silver per Ounce Troy.

May.	1896.				1895.				
	St. Ex.	London.	N. Y. Cts.	Value of sil. in \$.	St. Ex.	London.	N. Y. Cts.	Value of sil. in \$.	
16	4 88 3/4	31 1/8	67 3/4	525	20	4 88 3/4	31 1/8	67 3/4	525
18	4 88 3/4	31 1/8	67 3/4	525	21	4 88 3/4	31 1/8	67 3/4	525
19	4 88 3/4	31 1/8	67 3/4	525	22	4 88 3/4	31 1/8	67 3/4	525

The silver market has been quiet, but prices have been maintained. Owing to the presence of special orders the amounts hanging over the market have been disposed of, and while there is no great eagerness to buy, there is also no great anxiety to sell beyond the daily output.

The United States Assay Office in New York reports the total receipts of silver at 102,000 oz. for the week.

Gold and Silver Exports and Imports.

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

	Specie and bullion.		In ores.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
April 1896..	\$3,782,266	\$1,142,502	\$5,426	\$95,119	E. \$2,550,071
1895..	16,916,572	23,747,264	80,319	453,022	I. 7,203,395
1894..	33,514,726	19,033,291	310,912	432,354	E. 14,359,993
SILV.					
April 1896..	5,133,978	568,662	14,665	1,490,055	E. 3,695,926
1895..	20,429,322	4,391,752	554,169	5,513,136	E. 11,039,543
1894..	15,254,515	2,596,547		3,810,759	E. 8,847,269

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

Gold and Silver Exports and Imports, New York

For the week ending May 22d, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

We'k	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1896..	\$1,659,000	\$13,877	\$27,250	\$35,243	E. \$2,137,130
1895..	23,630,216	16,865,367	14,797,175	835,985	E. 2,726,039
1894..	32,335,922	19,646,549	13,018,516	561,617	E. 25,146,372
1893..	40,912,489	7,890,336	16,206,388	604,231	E. 48,614,310
1892..	61,328,583	5,716,997	12,254,099	1,157,152	E. 66,708,528
1891..	23,627,644	6,122,141	9,743,779	553,743	E. 26,895,539

Of the gold exported during the week \$50,000 went to the West Indies and the balance to Germany; the silver went to London. The gold and silver imported came chiefly from Central and South America.

Average Monthly Price of Silver

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

Month.	1896.		1895.		1894.	
	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.
January..	30 69	67 13	27 36	59 69	30 81	66 63
February..	31 01	67 67	27 47	59 90	29 18	63 43
March.....	31 34	68 40	28 33	61 98	27 28	59 49
April.....	31 10	67 92	30 39	66 61	28 95	62 92

FINANCIAL NOTES OF THE WEEK

The efflux of gold, as we indicated last week, has gone on but not on such a large scale as was anticipated by some of the financial houses. This is no doubt owing to certain sales of securities on the other side, one of them notably by J. P. Morgan & Co., amounting to more than \$4,000,000, which has somewhat eased up the exchange market.

The withdrawals of gold to-day for shipment by to-morrow's steamers will probably bring down the Treasury reserve to the neighborhood of \$111,000,000, and if no further sales of securities take place

abroad the old-time figure of \$100,000,000 will soon be reached.

The sooner the uncertainty now existing with regard to the money question and the basis upon which the currency of this country is settled the better. As pointed out by an influential banker to us to-day, the poorest of the British Australian Colonies in most respects, although its mineral resources have large possibilities, but for present development still rank far behind all the others, has just succeeded in placing a loan in London amounting to \$3,750,000, bearing 3% at 101 1/2.

The statement of the United States Treasury on Thursday, May 21st, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

	May 14.	May 21.	Changes.
Gold.....	\$116,154,105	\$112,559,931	D. \$3,594,174
Silver.....	25,226,812	26,924,826	I. 1,698,014
Legal tenders.....	84,887,092	84,790,984	I. 96,098
Treasury notes, etc.,	32,342,122	32,563,104	I. 220,982

Totals.....\$257,600,131 \$26,837,945 D. 702,186
Govt. bank dep..... 23,768,107 23,372,226 D. 395,881

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$132,163,280. Against these are held in the Treasury 12,217,497 coined standard silver dollars, and the silver bullion purchased at a cost of \$119,945,783, making a total of \$132,163,280.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending May 16th, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

	1891.	1895.	1896.
Loans and discounts.....	\$167,010,100	\$195,303,100	\$176,458,400
Deposits.....	578,185,900	553,778,400	497,993,300
Circulation.....	10,028,600	13,267,000	14,382,800
Specie.....	1,060,700	68,796,100	60,114,300
Legal tenders.....	122,938,000	107,236,400	82,962,000

Total reserve.....\$223,545,600 \$176,032,500 \$143,076,300
Legal requirement..... 114,546,475 138,444,600 124,498,325

Surplus reserve.... \$78,999,125 \$37,587,900 \$18,577,975

Changes for the week this year were increases of \$2,401,700 in loans, \$2,977,800 in deposits, \$32,000 in circulation, and \$653,400 in specie; decrease of \$1,574,100 in legal tenders, and \$1,065,150 in surplus reserve.

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

	Gold.	Silver.	Total.
Asso. Banks of New York.....			\$60,114,300
1895.....			68,796,100
Bank of England.....	\$236,333,830		236,333,830
1895.....	185,767,810		185,767,810
Bank of France.....	398,336,700	\$250,49,400	648,386,100
1895.....	410,822,183	249,134,924	659,957,107
Imp. Bank of Germany.....			227,760,000
1895.....			269,580,000
Austro-Hungarian Bank.....	134,380,000	64,022,000	198,402,000
1895.....	92,771,000	67,796,000	160,567,000
Netherlands Bank.....	13,176,000	34,732,000	47,908,000
1895.....	21,456,000	35,245,000	56,701,000
Belgian National Bank.....			19,665,000
1895.....			23,006,000
Bank of Spain.....	42,028,000	52,772,000	94,800,000
1895.....	40,921,000	61,869,000	101,890,000
Bank of Italy.....	62,625,000	10,495,000	73,120,000
1895.....	69,210,000	11,415,000	80,625,000
Imp. Bank of Russia.....			410,774,400
1895.....			274,950,000
		34,709,000	39,630,000

The return for the Associated Banks of New York is of date May 16th; all the others are of date May 21st, except the Bank of Italy, which is dated April 20th, and the Bank of Russia, whose return is dated April 16th-28th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports its gold only, not considering silver at all. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

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

	1895.	1896.	Changes.
India.....	\$1,501,230	\$1,672,298	I. \$171,068
China.....	1,064,573	427,450	I. 637,123
The Straits.....	274,605	282,882	I. 8,277
Totals.....	\$2,840,408	\$2,382,630	D. \$457,778

Arrivals for the week this year were £199,000 in bar silver from New York, £36,000 from Chile, and £23,000 in Mexican dollars from Vera Cruz; a total of £258,000. Shipments for the week were £22,000 in bar silver to Bombay, and £75,000 to Japan; a total of £97,000.

The two facts that exports of cotton from India continue to be exceptionally light and that the active speculation in rupee paper is at an end have depressed Indian exchange, and the price of Council bills in London has fallen to 14.12d. per rupee, although all of the 60 lakhs offered were taken.

phuric acid, 66^o, 70@95c.; 10@15c. higher for small quantities; chamber acid, \$6.00@6.50 per ton at factory. Blue vitriol, \$3.87¹/₂@\$4, according to size of order.

Brimstone.—Business in this article shows slight improvement from last week. Quotations for shipments are \$15.75@16 for unmixed seconds and \$15.25@15.50 for thirds.

Fertilizing Chemicals.—Dullness continues to characterize this market. We quote current prices as follows: Sulphate of ammonia, gas liquor, \$2.30; bone, \$2.20@2.30. Dried blood, high grade, \$1.75@1.80; low grade, \$1.60@1.65 per unit. Azotine, \$1.80. Concentrated phosphate (30% available phosphoric acid), 70@71¹/₂c. per unit. Acid phosphate, 13% to 15%, av. P₂O₅, 54@55c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P₂O₅, 90@92c. per unit. Acidulated fish scrap, \$10@11 and dried scrap with few or no sales, nominally \$18@19 f. o. b. fish factory. Tankage, high grade, \$18.50@19.50; low grade, \$18@19. Bone tankage, \$21; ground bone, \$22.50@23.00. Bone meal, \$19.50@23.

Sulphate of Potash: 90-95%, New York and Boston, \$1.90¹/₂; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 48-53%, New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk, \$1.02; Southern ports, \$1.03¹/₂.

Muriate of Potash.—The request for this article continues small. New prices for muriate are New York and Boston, 1.78c.; Philadelphia, Baltimore and Norfolk, 1.79¹/₂c.; New Orleans, 1.81¹/₂c., for 80@85% (basis of 80%), in lots 50 tons and upward.

Kainit.—Quotations for 1896 are as follows: New York, Boston, Philadelphia and Baltimore, \$8.80 per ton; Norfolk, \$9.15, and New Orleans, \$9.30 per ton, for 25 tons and upward. Sylvinit at the same ports is quoted at 36¹/₂c., 37¹/₂c. and 38c., respectively.

Nitrate of Soda.—Spot, 1.70@1.75c.; to arrive, 1.75@1.80c.

Liverpool. May 12.

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

There is nothing new in the position of heavy chemicals, the market continuing dull and featureless.

Soda ash is rather lifeless, while quotations vary according to export market, the nearest spot range for tierces being about as follows: Leblanc ash, 48%, \$4 @ \$4 5s.; 58%, \$4 5s. @ \$4 10s. Ammonia ash, 48%, \$3 2s. 6d. @ \$3 10s.; 58%, \$3 7s. 6d. @ \$3 12s. 6d. per ton, net cash; bags 5s. per ton less. Soda crystals are quiet but steady at \$2 7s. 9d. per ton, less 5% for barrels and 7s. less for bags.

Caustic soda is slow. Quotations are nominally unchanged, and we quote spot range, according to market, as follows: 60%, \$6 5s. @ \$6 10s.; 70%, \$7 5s. @ \$7 10s.; 74%, \$8 5s. @ \$8 10s.; 76%, \$9 @ \$9 5s. per ton, net cash.

Bleaching powder is in limited request and is nominally quoted at \$7 2s. 6d. @ \$7 5s. per ton, net cash, for hard wood packages.

Chlorate of potash is dull at 4¹/₂d. @ 4³/₄d. per pound. Bicarb. soda is in fair demand and firm at \$6 15s. per ton, less 2¹/₂% for the finest quality in one cwt. kegs, with the usual allowances for larger packages.

Sulphate of ammonia is not active, but prices are well maintained at \$8 5s. @ \$8 7s. 6d. per ton, less 2¹/₂% for good gray and 2s. for 25% in double bags, f. o. b. here, according to quality. Nitrate of soda is held for \$8 5s. @ \$8 7s. 6d. per ton, less 2¹/₂% for double bags, f. o. b. here, according to quality. Only a retail business is passing. Carb. ammonia, lump, 3¹/₂d. per pound; powdered, 3³/₄d. per pound, less 2¹/₂%.

MINING STOCKS.

Complete quotations will be found on pages 510 and 511 of mining stocks listed and dealt in at:

New York. Aspen, Colo. St. Louis. Colorado Springs, Para, France. Philadelphia. Duluth, Minn. Mexico. Baltimore. Helena, Mont. Shanghai, China. Pittsburgh. Salt Lake, Utah. Valparaiso, Chile. Denver, Colo. San Francisco. London, England. Chicago and Cleveland, page 58.

NEW YORK, Friday Evening, May 22.

This week has been uneventful, as usual, in mining stock circles. The speculating public is still holding off buying and the volume of business done has naturally decreased. The number of sales reported on the Consolidated Stock and Petroleum Exchange is 15,300 shares, against 33,750 shares last week, showing that the spurt we reported in our last issue was only temporary.

The Comstock was dealt in to the customary extent. Comstock Tunnel records sales of 4,100 shares at 8@9c.; Consolidated Imperial, 1,000 shares at 4c. and Consolidated California & Virginia, 650 shares at \$2.55@3.60. Other sales were as follows: 600 shares of Sierra Nevada at \$1.10@1.45; 600 shares of Potosi at \$1.55; 600 shares of Chollar at \$2.65@2.95; 300 shares of Mexican at 93c. @ \$1.15; 300 shares of Best & Belcher at \$1.65@2; 500 shares of Hale & Norcross at \$2.15@2.60; 200 shares of Gould & Curry at \$1.70@2.15.

The Colorado stocks were duller than usual. The most active have been Iron Silver, with 2,000 shares at 18@19c., Mount Rosa, 800 shares at 9@10c., Leadville Consolidated, 600 shares at 13@14c. and Isabella with dealings of 500 shares at 54c. Victor was dealt in to the extent of 250 shares at 88.25@88.50.

Of the Utah stocks Horn Silver shows sales of 150 shares at \$2 20.

The California stocks were very quiet this week. Brunswick Consolidated was dealt in to the amount of 100 shares at 14c.

Boston. May 21.

(From Our Special Correspondent.)

The market for copper stocks has been booming this week and prices have taken a jump upward which bids fair to equal the speculation of last year. The advance in copper is the primal cause, but prices have ruled so low the past few months that it has caused buying by parties who believe that they have been selling below their normal value, and offer a wide margin for an advance. Boston & Montana has been very active, and to the average speculator offers more inducements than any other on the list; consequently it takes the lead in the market. In the early part of the week there was but little doing in it, and prices held around \$78@79, but the last three days it increased in activity and to-day the price was forced up to \$88, with reaction to \$86, and closing at \$86¹/₂@87. Over 40,000 shares were dealt in. Old Dominion started into prominence this week and scored an advance from \$16¹/₂ to \$22¹/₂, with large sales, and closed firm at \$21¹/₂@21¹/₂.

Calumet & Hecla advanced from \$303 to \$310. Quincy, after selling at 114 in early dealings, advanced to \$119, which was the closing bid. The scrip sold at \$81@85. Tamarack advanced from \$90 to \$97, but the bid at the close was \$95. Osceola had a good advance, selling from \$26¹/₂ to \$30¹/₂, with an active demand and closed firm. Kearsarge advanced to \$14 and held the advance. Atlantic was also in demand and sold up to \$22, an advance of \$5 for the week. Franklin sold in a small way at \$13. There is no speculation in this stock at present.

Tamarack, Jr., which sold last week at \$9, was up to \$13¹/₂-to-day and in fair request. Tecumseh also came out and sold at \$3@3¹/₂. Wolverine was fairly active at \$7¹/₂@7¹/₂. Butte & Boston, which last year was an active stock, is now a back number, with a few sales at \$2¹/₂@2¹/₂. Arnold opened at \$1 and advanced to \$1¹/₂ and 500 shares of Ridge sold at \$1. Centennial sold at 50c.

The gold stocks were fairly active, with Pioneer and Merced as leaders. The former declined early to \$8¹/₂, but rallied and sold at \$9¹/₂, with later sales at \$9. The latter sold early in the week at \$9¹/₂ and steadily advanced, selling up to \$13¹/₂-to-day, but closed at \$12¹/₂@12¹/₂. Santa Ysabel sold up to \$11¹/₂, a gain of \$2 for the week. Gold Coins sold at 50@55c., with last sale at 52¹/₂c.

The market closed with prices a shade lower than the highest, but steady.

Chicago. May 20.

(From our Special Correspondent.)

The trading of the previous week, while considerably in excess of the previous one, has been light. Prices with but an exception or two, have been well sustained and close higher. There have been several large transactions concluded on private terms, notably for Hawk-Eye and Imperial, and orders from outside points are coming in somewhat more freely. There is a general feeling of buoyancy among the brokers in anticipation of better business in the near future with the settlement of the political agitation now engaging the public mind. The monthly reports which have come in from the properties represented on the board indicate activity in pushing development work. The afternoon call of the board has been temporarily discontinued during the heated term, and the change thus far is working well. There is now a continuous session from 10 a. m. to 3 p. m. with a daily call at 11:30 o'clock.

The following table gives the highest prices with sales of the stocks recorded on the Chicago Mineral and Mining Board for the week ending May 20th:

Stocks.	May 11	May 15	May 16	May 18	May 19	May 20	Sales.
Alchemist	.08 ¹ / ₂	.08 ¹ / ₂				.07 ¹ / ₂	16,000
Boston & C. C.	.01 ¹ / ₂						1,000
Capazone		.03			.03 ¹ / ₂		4,000
C. C. & C. C.	.07					.07	7,000
C. C. Golden Group	.09 ¹ / ₂		.10	.10 ¹ / ₂	.10 ¹ / ₂	.10 ¹ / ₂	15,500
C. C., G. M. B. & L. Co.							3,000
Chi. & G. Mt.	.06				.05		85,500
Cosmopolitan	.06 ¹ / ₂	.06	.06	.06	.06 ¹ / ₂	.06 ¹ / ₂	15,100
Delaware Cf.	.24	.24 ¹ / ₂	.24 ¹ / ₂	.24 ¹ / ₂	.24 ¹ / ₂	.24 ¹ / ₂	5,000
Finance	.04 ¹ / ₂	.04 ¹ / ₂					12,000
Great Fissure	.11 ¹ / ₂			.11 ¹ / ₂	.12	.12 ¹ / ₂	4,000
Hawkeye	.31 ¹ / ₂	.31 ¹ / ₂					1,000
Imperial	.15						25,500
Prd.	.23 ¹ / ₂	.22 ¹ / ₂	.22 ¹ / ₂	.22 ¹ / ₂	.22 ¹ / ₂	.22 ¹ / ₂	2,000
Investors' and Prospectors'	.06			.06			28,000
Little Gem	.04	.04		.04			15,600
Lucille	.16 ¹ / ₂	.16 ¹ / ₂	.16 ¹ / ₂	.16 ¹ / ₂	.16 ¹ / ₂	.16 ¹ / ₂	17,500
Medina G. M. Co.	.07 ¹ / ₂	.07 ¹ / ₂	.07 ¹ / ₂	.07 ¹ / ₂	.07 ¹ / ₂	.07 ¹ / ₂	41,500
Peerless G. M. Co.	.11 ¹ / ₂	.11 ¹ / ₂	.11 ¹ / ₂	.11 ¹ / ₂	.11 ¹ / ₂	.11 ¹ / ₂	1,000
Rhyolite			.10				58,000
Sumpter	.04 ¹ / ₂	.04 ¹ / ₂	.04 ¹ / ₂	.04 ¹ / ₂	.04 ¹ / ₂	.04 ¹ / ₂	3,000
Sunnyside	.10			.10	.09		

Total shares sold, 369,660.

Cleveland, O. May 21.

(From Our Special Correspondent.)

Offerings of iron ore stocks this week have been a little more plentiful and some transactions have occurred. They have been as a rule at prices a point

or two below previous quotations. Sales of Republic, Lake Superior, Chandler and Cleveland Cliffs are reported at some concessions. Quotations follow:

Name of Company.	Par val.	May 21.	
		Bid.	Ask.
Aurora	\$25		\$8
Chandler	25	\$38	40
Cleveland-Cliffs Iron Co.	100	42	43
Jackson Iron Co.	25	70	75
Lake Superior Iron Co.	25	30	31
Lake Superior Consolidated	100	20	21
Minnesota Iron Co.	100	70	71
Pittsburg & Lake Angeline	25	80	85
Republic Iron Co.	25	17	18

Colorado Springs, Colo. May 16.

(From Our Special Correspondent.)

The past week week has witnessed the long-expected reaction for the better in the mining stock market. The volume of business showed an appreciable increase over the preceding fortnight and prices generally ruled both higher and firmer. The principal demand was for the better class of stocks, especially those which are paying dividends and are therefore regarded as good securities for investment rather than for speculation. Many of the cheaper stocks, however, were also in better inquiry, and hopes are entertained that this revival of activity all along the line will prove to be more than a mere temporary spurt.

I have been requested once more to warn the Eastern public against the promoters of Cripple Creek "wildcat" mining companies, some of whom, I understand, are now in the camp for the purpose of buying some worthless prospect which they will transform into "paying mines"—on paper. Anyone who contemplates investing in Cripple Creek stocks can ascertain the reliability of the companies by writing to Mr. D. V. Donaldson, Secretary of the Colorado Springs Mining Stock Association, or to Mr. M. B. Irvine, Secretary of the Colorado Springs Board of Trade and Mining Exchange.

Messrs. Gardner & Co. furnish the closing quotations of the Colorado Springs Mining Stock Exchange for the week ending May 7th, as follows:

Name of Company.	May 15	May 16	May 18	May 19	May 20	May 21
Alamo	.06 ¹ / ₂	.06 ¹ / ₂	.06 ¹ / ₂	.06 ¹ / ₂	.06 ¹ / ₂	.06 ¹ / ₂
Anaconda	.61	.62	.60	.60	.60	.61
Arcum-Junita	.54	.54 ¹ / ₂	.54	.54	.54	.54
Blue Bell	.06	.06	.06	.06	.06	.06
Cripple Creek Con.	.15	.14	.14	.14	.13 ¹ / ₂	.13
Golden Future	1.72	1.73	1.72	1.68	1.68	1.70
Isabella	.57 ¹ / ₂	.57	.55	.54	.55	.55
Mollie Gibson	.61	.66	.73	.66	.63	.66
Mount Rosa	.09 ¹ / ₂	.09	.09 ¹ / ₂	.09	.09	.09
Pharmacist	.07 ¹ / ₂	.07 ¹ / ₂	.07 ¹ / ₂	.07	.07	.07
Portland	1.68	1.73	1.65	1.63	1.72	1.70
Silver State	.01 ¹ / ₂	.01 ¹ / ₂	.01 ¹ / ₂	.01 ¹ / ₂	.01 ¹ / ₂	.01 ¹ / ₂
Union	.43 ¹ / ₂	.40	.40	.39 ¹ / ₂	.38	.41
Work	.11 ¹ / ₂	.12 ¹ / ₂	.12 ¹ / ₂	.11 ¹ / ₂	.11 ¹ / ₂	.11 ¹ / ₂

In addition to the above quotations Messrs. A. Pick & Co., of New York, furnish the following:

Name.	May 15	May 16	May 18	May 19	May 20	May 21
Bankers	.14 ¹ / ₂	.14	.13			
Des Moines						
Gold & Globa	.23 ¹ / ₂	.22 ¹ / ₂	.23			
Gold Standard	.09 ¹ / ₂	.09 ¹ / ₂	.08 ¹ / ₂			
Isabella	.58	.55 ¹ / ₂	.55			
Jefferson	.17 ¹ / ₂	.16	.17 ¹ / ₂			
Keystone						

Salt Lake City, Utah. May 16.

(Special Report of James A. Pollock.)

The week just closed has been a very good one for the local mining stock market, and with few exceptions the quotations have advanced all along the line. Money for investment seemed to be plentiful, both locally and on the outside.

Ajax opened strong, and toward the end of the week showed a gain, closing higher than at the close of the previous week. Anchor made another heavy draft on its mining force about the middle of the week, and the properties were all but closed down. This action on the part of the company caused the stock to slump materially, and the close was weak. Alliance was inactive, and Gas did little.

Bullion-Beck was in demand at about the previous week's figures. Bogan showed considerable activity at strong quotations.

The regular monthly dividend of \$1 per share was paid by the Centennial-Eureka on the 15th, making a total of \$1,680,000 paid by the company. Comparatively little of the stock was offered for sale, with the demand strong. Dalton held its own, with the demand for the stock quite active. Daly and Daly West were both strong, with the inquiry for the stocks brisk. Daly again sold above \$8. Dalton & Lark pays its usual one-half cent dividend to-day. This makes the third payment for the company. There was no change in the price of the stock.

Eagle was in fair demand, but at shaded figures. Work at the properties continues as usual. Four Aces strengthened somewhat and sold at better figures than during the previous week. Galena sold higher than at any other time in the history of the company. The 5c. dividend was paid on the

10th. The litigation between the Geysier and Marion has not come before the court yet, but will be called next week. Regular shipments of cyanide product are being made by the Geysier. Horn Silver was practically out of the market, bids above \$2.15 not bringing out any stock. Little Pittsburg was inactive compared to its old record.

Mammoth again showed strength and sold above the \$3.50 mark. Mercur pays its monthly dividend on the 20th, and payments are to be regular in the future.

Ontario continued strong. Rover was shaded materially. Silver King was hardly offered, with the bidding strong and spirited. Sioux Consolidated is held firmly. Sunshine made little change; there were few buying orders in and only limited offerings. Swansea was quite active and stronger toward the close. Tetro claimed considerable attention and sold higher than for two months.

San Francisco. May 16.

(From Our Special Correspondent.)

This has been the liveliest week of trading in the Comstocks that we have seen for a long time, more shares were sold and at better prices than we have been used to seeing. The reported developments in the Chollar and at other points in the Brunswick lode, with the decision in the Hale & Norcross suit started in the excitement, which was kept up pretty well all the week. One attempted bear raid on Monday only served to help the activity. On Thursday there was some reaction, but it was almost all recovered, and the market closed to-day a little quieter but firm, with promise of strength for next week.

Some closing prices are: Consolidated California & Virginia, \$3.25@3.35; Chollar, \$2.85@2.90; Ophir, \$2.20@2.25; Hale & Norcross, \$1.85@1.90; Occidental, \$1.80@1.90; Gould & Curry, \$1.70@1.75; Best & Belcher, \$1.70@1.75; Potosi, \$1.45@1.50; Savage, \$1.25@1.30; Sierra Nevada, \$1.15@1.20; Union, \$1.05@1.10; Mexican, \$1@1.05.

The Bodies felt the effect of the excitement also. Bodie Consolidated closes at \$1.05@1.10; Bulwer, 45@46c; Mono, 16@18c.

The total number of shares sold on the San Francisco Stock and Exchange Board this week was 261,930—almost a month's business as things have been going lately.

The Skagit Cumberland Coal Company has levied an assessment of 3c. per share, delinquent June 12th.

A special meeting of the stockholders of the Julia Consolidated Mining Company will be held on May 21st, to decide what disposition shall be made of the stock in the company's treasury.

The annual meeting of the Silver Hill Mining Company has been called for May 25th.

THE NEW EXCHANGE.

Business on the San Francisco Gold Mining Exchange was also active this week, and enough shares were dealt in on the Call Board to make the brokers look cheerful. New applications keep coming in and the engineers of the Exchange are busy making investigations. Several properties will soon be listed, it is understood.

Some closing quotations are: Amalie, \$2; Sebastopol, 55@56c.; Edna, 50@51c.; Savannah, 40@42c.; Lockwood, 37c.; Grant, 21c.

The Edna is a new company listed this week. The Exchange experts report it as a large deposit of free-milling ore, with plenty of water and wood on the property. General formation is talcose chloritic slate, inter-stratified with quartz and occasional seams of steatite, all soft and decomposed. It is in Calaveras County, three miles northwest of San Andreas. The development has been made by a vertical shaft sunk 140 ft. A surface adit or level has been driven in from the side of the hill 310 ft., intersecting the vertical shaft at a distance of 250 ft. from the mouth and 92 ft. from surface. On the eastern slope of the hill another level has been driven 130 ft., intersecting the shaft at 34 ft. depth. From No. 1 level an irregular crosscut has been driven north 40 ft. At 80 ft. a level has been driven from the shaft about 70 ft. to the southwest.

London. May 9.

(From Our Special Correspondent.)

In spite of many adverse circumstances, Chartered have remained comparatively steady at or near £3 during the past week. The market and the public have got so used to rumors with regard to the government of Rhodesia and the relations with the Transvaal that not even rumors founded on fact have any substantial effect on quotations. The announcement of the resignation of Messrs. Beit and Rhodes, the dissensions among the directors of the Chartered Company, and the speech of Mr. Chamberlain on Friday, all fell flat on the market, and no one has been disposed to go either bulls or bears. In spite of the recent revelations with regard to the conspiracy, public feeling is still on the side of Mr. Rhodes. A lawsuit is to be commenced by some of the leading shareholders in the Chartered Company against Messrs. Beit & Rhodes, with the object of saddling these gentlemen with the cost of the conspiracy and raid, and a Parliamentary committee is to be appointed after the Jamieson trial is over to inquire into the whole position of the Chartered Company and its directors.

After Chartered the most prominent of South African shares has been Consolidated Gold Fields of South Africa. These shares suffered a shock by the announcement, no doubt a false one, that the Transvaal Government had ordered a suspension of the business of the company and had given a month's notice for the closing of the accounts and clearing

out of the country. It is not very likely that this rumor is founded on fact, though it must be said that similar tactics were resorted to by the Orange Free State against the Standard Bank of South Africa some years ago. Shortly after this rumor was floated round the market came the announcement of an advance of 10 shillings per share for the past six months, but this dividend failed to restore life to the stock.

In other branches of the mining market there has been a fair amount of activity. Indians and New Zealand have been strong, but without any feature of interest. Copper stocks have seen a further substantial advance. The remarkable decrease in the available supply of copper in merchants' hands has shown such an improvement in consumption that a rise in the price is anticipated, with a consequent increase in the profits of the copper companies.

The chief item of interest in the American section has been the introduction of the Playa de Oro stock. In the issue of the *Engineering and Mining Journal* of January 14th, 1893, a critical and descriptive article on the property and prospects of this company was given, so that details need not be entered into here. It would be an opportune moment for some one intimately acquainted with the company and its prospects to send full information to the *Engineering and Mining Journal*.

As regards a revival of American mining in London, appearances tend to show that it will not come just immediately. In fact a mining boom of any sort is not to be expected at present, as everyone is occupied in the bicycle boom. Tire companies, tube companies and cycle makers' companies are filling the air and for some time the energies of promoters and the funds of speculators will be monopolized by them.

Paris. May 10.

(From Our Special Correspondent.)

All the world is going to Moscow this week, and in fact there is a great rush to see the gorgeous ceremonies which are so soon to take place there, and which will have in all their magnificence some of that semi-barbaric element which still appeals very strongly to our civilized imaginations. And after all there is something imposing in this enthronement of this young man whose word may mean so much for all of us. In Western Europe royalty counts for very little with the men of to-day; a king is a very ordinary and often a very insignificant individuality in our eyes, and a banker may really stand for much more. Russia is the one country in Europe where absolutism still means something, where parliaments and public opinion have not reduced the chief of the state to a comparatively small factor in the equation of power.

And in truth Russia is a great deal in men's minds just now. It is the one country in Europe which has room for expansion within its own limits. No one yet knows the full measure of its resources, and the concentration of power in a single head, with the still complete devotion of the great mass of the people to the Czar, gives the country a unique position; while the element of uncertainty involved in the absolutist control adds a certain fascination to the study.

Our Viennese neighbors, who are the wildest speculators in Europe, are just now agitated over the renewal of the treaty between the two sections of the double monarchy. The negotiations are at a standstill for the present; Austria insists that Hungary is in a position to pay a much larger share of the common expenses—army, navy and foreign relations—than she was 30 years ago, when the present treaty was made; but Hungary is not willing to assume the increased burdens. Reason seems to be rather on the Austrian side, for Hungary is really the strong and growing half of the Empire, while Austria advances but little.

Our home politics are quiet and we are waiting chiefly to see what policy the Melne ministry will formulate.

I have given you little but politics this week, but really there is little else to write. The stock market is quiet, and is affected chiefly by political rumors. The metallurgical stocks continue strong and the copper shares are also in good demand. South African stocks are quiet, but not strong, because everyone is waiting for developments in the Transvaal situation.

Our financiers here are watching your presidential campaign closely, and I must confess that the situation is a little puzzling from our point of view. Why do not your business men make their power felt and insist on giving the proper prominence to the currency question, the proper settlement of which is for you the first condition of prosperity? I am sure they can, if they will.

AZOTE.

MISCELLANEOUS DIVIDENDS.

Lehigh Coal and Navigation Company, dividend of 2% on the capital stock, payable May 27th at the office in Philadelphia.

Pennsylvania Railroad Company, semi-annual dividend of 2 1/4% on the capital stock, payable May 29th at the office in Philadelphia.

Welsbach Commercial Company, quarterly dividend of 2% on the preferred stock, payable June 10th at the office, 40 Wall street, New York.

MEETINGS.

Name of Co.	Location of office.	Date.	Time.
Enola.....	1609 No. Weber St., Colorado Springs, Colo.....	May 28	3 p. m.
Jay Gould.....	Pittsburg Block, Helena, Mont.....	" 25	2 " "
L. on Gold.....	115 1/2 Montg'm'ry St., San Francisco, Cal.....	June 24	11 a. m.
Minnesota Iron Park View.....	Duluth, Minn.....	" 8	11 " "
St. Paul & Butte Silver Bow Gold & Precious Stone.....	108 East Pike's Peak avenue, Colorado Springs, Colo.....	May 30 June 15	7.30 p. m. 10 a. m.
Tom Moore.....	37 East Broadway, Butte, Mont.....	" 17	2 p. m.
Yellow Jacket.....	280 Broadway, New York, N. Y.....	May 29	" "
	816 Equitable Building, Denver, Colo.....	" 29	10 a. m.

ASSESSMENTS.

Name of Co.	Loc'n.	No.	Delinq.	Sale.	Amt.
Alpha Con.....	Nev.....	16	May 12	June 2	.75
*Alta.....	"	52	June 9	" 30	.10
Burlington.....	Cal.....	2	May 27	" 17	.3
Caledonia.....	Nev.....	46	" 6	May 27	.05
Camp Floyd.....	Utah.....	"	" 16	June 1	.01
Channel Bend.....	Cal.....	2	" 22	" 13	.05
Crown Point.....	Nev.....	67	" 6	May 28	.20
Flint Creek.....	Mont.....	"	" 22	June 12	.00 1/2
Gold Queen.....	Utah.....	"	" 11	" 1	.10
Golden Sand.....	Cal.....	2	" 20	" 8	.51
*Granite Hill.....	"	14	" 20	" 10	.10
*Horseshoe Bar Con.....	"	4	June 22	July 14	.50
Lady Emma.....	"	"	May 25	June 25	.20
*Leo.....	Mont.....	"	" 28	" 19	.00 1/2
*Lucky Bill.....	Utah.....	11	June 13	July 11	.02
*Mexican Gold & Silver.....	Nev.....	54	May 28	June 18	.20
Mohawk Con.....	Utah.....	"	June 1	" 29	.01 1/2
New Era.....	S. D.....	3	" 1	" 19	.01 1/2
North Eureka.....	Utah.....	1	May 30	" 27	.00 1/2
Occidental Con.....	Nev.....	22	" 10	May 28	.10
Old Flag.....	Cal.....	2	" 10	" 26	.03
Overman.....	Nev.....	75	June 5	June 25	.10
Peabody.....	Cal.....	6	" 3	" 24	.10
Potosi.....	Nev.....	45	May 14	" 4	.20
Ruby Bell.....	S. D.....	13	June 1	" 19	.03
*Savage.....	Nev.....	89	" 3	" 23	.20
*Silver King.....	Ariz.....	14	" 16	July 14	.25
Siskiyou Con.....	Cal.....	11	" 8	June 29	.01
*Skagit Cumb'r'd Coal.....	Wash.....	1	" 12	July 11	.03
Surprise.....	Cal.....	1	May 30	" 1	.20
Utah Con.....	Nev.....	22	" 6	May 27	.05
*Wide Awake.....	Cal.....	31	June 8	June 29	.05

*New assessment.

DIVIDENDS.

NAME OF COMPANY	Current Dividends.		Paid since Jan. 1, 1896.	Total to date.
	Date.	Amount.		
Alta Con.....			\$10,000	\$50,000
*Alaska-Mexican.....			31,209	157,031
*Alaska Treadwell.....			150,000	2,825,000
Anaconda.....	May 1	\$750,000		
Big Six.....	" 20	\$2,500	2,500	2,500
Boston & Mont.....	" 20	\$300,000	600,000	4,025,000
Bullion Beck & Ch.....			65,000	2,015,000
*Calumet & Hecla.....	May 15	\$50,000	1,590,000	44,850,000
*Caribou.....	" 16	\$16,000	16,000	79,000
*Centennial-Eureka C. I.....	" 15	\$30,000	180,000	1,680,000
*Dalton & Lark.....	May 15	\$12,500	50,000	25,000
D. minion Coal.....			600,000	50,000
Elkton Con.....	May 25	\$10,000	10,000	45,000
*Florence.....	" 1	\$10,000	34,300	89,348
*Galena.....	" 10	\$5,000	11,000	31,000
*Gold Coin.....			45,000	6,000
*Golden Fleece.....	May 15	\$18,000	90,000	491,179
Gold & Globe Hill.....	" 15	\$2,250	17,250	26,625
Hecla Con.....			30,000	2,130,000
Highland.....			25,000	3,153,918
*Homestake.....	May 25	\$31,250	156,250	5,868,750
Horn Silver.....			50,000	5,130,000
*Iron Mountain.....			25,000	435,000
*Isabella.....	May 25	\$22,500	100,000	112,500
Le Roi.....	" 15	\$50,000	75,000	150,000
Mercur.....	" 11	\$25,000	100,000	450,000
Minnesota Iron.....			247,500	2,932,500
*Mont. Ore Pur. Co.....	May 20	\$10,000	200,000	300,000
Moon Anchor.....	" 15	\$6,000	12,000	12,000
Moose.....			6,000	186,000
Napa Con.....			30,000	770,000
*Ontario.....	June 1	\$15,000	75,000	13,250,000
Osceola Con.....			75,000	2,022,500
Otagoachy.....			1,000	1,000
Portland.....	May 15	\$30,000	9,000	713,000
Quincy.....			40,000	8,070,000
*Silver King.....			187,500	637,500
Slocan Star.....	May 15	\$100,000	100,000	100,000
Small Hopes.....			25,000	3,275,000
*Smuggler-Union.....			50,000	50,000
Union.....	May 5	\$12,500	12,500	62,000
*Utah.....	" 10	\$2,000	10,000	142,000
*Victor.....	" 15	\$20,000	100,000	565,000
Victor M. & L.....			9,000	35,000
*War Eagle.....			25,000	157,500
Totals.....			\$2,010,550	\$5,647,680

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

STOCK QUOTATIONS.

BOSTON, MASS.*

Table of stock quotations for Boston, Mass. listing companies like Allouez, Arnold, Atlantic, Bost. & C.C., etc., with columns for location, par value, and prices for various dates from May 15 to May 21.

* Official quotations Boston Stock Exchange. † Ex-dividend. Total sales, 63,277.

NEW YORK.*

Table of stock quotations for New York listing companies like Adams, Ajax, Alamo, Alliance, etc., with columns for location, par value, and prices for various dates from May 16 to May 22.

* Official quotations Con. Stock & Petroleum Exchange. Total sales, 15,300.

INDUSTRIAL COAL AND COAL RAILROAD.*

Table of stock quotations for Industrial Coal and Coal Railroad listing companies like Balt. & Ohio, Ches. & Del., Col. C. & I. Dev., etc., with columns for par value and prices for various dates from May 16 to May 22.

* Official quotations N. Y. Stock Exchange. Total shares sold, 43,510.

COLORADO SPRINGS, COLO.†

Table of stock quotations for Colorado Springs, Colo. listing companies like Ajax, Alamo, Anaconda, Aola, Argonaut, etc., with columns for par value and prices for various dates from May 11 to May 16.

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

ST. LOUIS, MO., STOCKS. Week ending May 20.

Table of stock quotations for St. Louis, Mo. listing companies like Central Lead, Con. Coal, Doe Run Lead, Granite Mtn., St. Joe Lead, with columns for company name, office, par value, bid, asked, and last dividend.

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 May 16 to May 21.

* Official telegraphic quotations, San Francisco Stock Exchange.

BALTIMORE, MD.* Week ending May 21.

Table of stock quotations for Baltimore, Md. listing companies like Balt. M. & S., Conrad Hill, G. Crk Coal, with columns for location, par value, bid, asked, and last dividend.

* Official quotations Baltimore Stock Exchange.

MISCELLANEOUS SECURITIES. May 21.

Table of miscellaneous securities listing companies like American Coal, Chateaugay Ore & Iron R. R., Mahoning Coal R. R., etc., with columns for location, par value, bid, and asked.

LONDON. May 8.

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations (Buyers, Sellers), and Prices.

DENVER, COLO.

Table with columns: NAME OF COMPANY, Par value, May 11, May 12, May 13, May 14, May 15, May 16, and Sales.

PARIS. Week ending May 8.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Div. year, and Prices (Opening, Closing).

All the companies are located in Colorado. Total shares sold: listed, 283,553; unlisted, 1,087,000.

PHILADELPHIA, PA.

Table with columns: NAME OF COMPANY, Location, Par value, and prices for May 14, 15, 16, 18, 19, 21.

Official quotations Philadelphia Stock Exchange. Total sales, 2,312.

MEXICO. Week ending May 14.

Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, and Prices (Opening, Closing).

Note.—In most Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Prices are in Mexican dollars.

VALPARAISO, CHILE.*

Table with columns: NAME OF COMPANY, Capital, Share value, Last Dividend, and Prices (Bid, Asked, Last sale).

Special Report of Jackson Bros. Values are in Chilean pesos or dollars.

SHANGHAI, CHINA.

Table with columns: NAME OF COMPANY, Country, No. of shares, Par value, Last dividend, and Price.

Special Report of J. P. Bissett & Co. The prices quoted are in Shanghai taels.

SALT LAKE CITY, UTAH.*

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

Special Report of James A. Pollock. All the companies are located in Utah.

PITTSBURG, PA.

Table with columns: NAME OF COMPANY, Location, Par value, Bid, Ask, Selling price, and NAME OF COMPANY, Location, Par value, Bid, Ask, Selling price.

Official quotations Pittsburg Stock Exchange.

HELENA, MONT.*

Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bid, Asked, Shares sold, Price, and Date.

Special Report of Samuel K. Davis. Total shares sold, 12,840.

DULUTH, MINN.*

Table with columns: NAME OF COMPANY, Par value, Bid, Asked, and NAME OF COMPANY, Par value, Bid, Asked.

Special Report of S. E. Frith.

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 \$31,320,000 in dividends and the Cons. Virginia \$42,330,000. 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
 Bullock, M. C. Mfg. Co.
 Burlington Rock Drill Co.
 Clayton Air Compressor Works
 Fraser & Chalmers.
 Ingersoll-Sergeant Drill Co.
 Laidlaw-Dunn-Gordon Co.
 (See Diamond Drills)

Air Hoists.
 Whiting Foundry Equipment Co.

Aluminum Bronze
 Fairbanks Co.

Amalgamators
 Bucyrus Steam Shovel & Dredge Co.
 Fraser & Chalmers.

Amalgam Plates.
 Western Plating and Mfg. Co.

Anti-Friction Metals
 Besley, Chas. H., & Co.
 Chester Steel Cast. Co.

Architects and Builders
 Berlin Iron Bridge Co.
 Pittsburgh Bridge Co.
 Pollock, Wm. B., & Co.

Assayers and Chemists' Supplies
 Alsworth, Wm.
 Baker & Adamson.
 Baker & Co.
 Becker, Christian.
 Bullock & Crenshaw.
 Denver Fire Clay Co.
 Elmer & Amend.
 Henry Hill Chem. Co.

Attorneys, Corporation
 Emig, C. E.

Automatic Boiler Feeds
 D'Este & Seelye
 Fenberby Injector Co.

Babbitt's Metal
 Besley, Chas. H., & Co.

Bankers and Brokers
 Arkell, E., & Co.
 Bartle & Co.
 Bonbright, W. P., & Co.
 Breitung, E. N.
 Carnoult, A. A.
 Crandall & Huff
 Crisp, Cr. Syn. Inv. Co.
 Decker, L. R.
 Duer, G. A. C.
 Dorsey, H. H.
 Doubleday Rope & Co.
 Edsall, Clarence & Co.
 Fall, Brooks & Cramer
 Farnsworth, C. & Co.
 Fitts, G. W., & Sons.
 Fletcher, C. S., & Co.
 Freyschlag, Kirby & Gardner & Co.
 Grant, E. H.
 Handy & Harman.
 Harriott, W. M.
 Hendrickson, W. J.
 Heron Bros.
 Hodgins, L. W.
 Hicks & Bendie.
 Johnson, L. L.
 Keith, F. M.
 Kenrick, W. F.
 Key, J. J.
 Kitchener, C. F. & Co.
 Lau, J. H., & Co.

Belting
 Carpenter, Geo. B., & Co.
 Hendrie & Bolthoff Mfg. Co.
 Leipheimer, N.
 Miller, Chas. N., & Co.

Belt Lacing.
 Bristol Co.

Blasting Caps.
 Metallic Cap Mfg. Co.

Blasting Batteries
 (Max Fuse Co.)
 Lau, J. H., & Co.

Blowers, Pressure.
 Connorsville Blower Co.

Boilers
 American Engine Co.
 Denver Eng. Wks. Co.
 Enterprise Boiler Co.
 Fraser & Chalmers.
 Heine Safety Boiler Co.
 Philadelphia Eng. Wks. Ltd.

Brattice Cloth
 Besley, Chas. H., & Co.

Brewers.
 Pabst Brewing Co.

Brick Machinery
 Fresno, E. H., & Co.

Bridges
 Berlin Bridge Co.
 Pittsburgh Bridge Co.

Buckets
 Besley, Wm. B. & Sons.
 (See Machinery.)

Car Wheels.
 Whiting Foundry Equipment Co.

Caissons
 Bishop, Victor, & Co.
 Lexow, Theodor.

Chain and Link Belting (See Belting.)
 (Chemicals)
 Baker & Adamson.
 Bullock & Crenshaw.
 Elmer & Amend.
 Henry Hill Chem. Co.

Coal
 Grand White Coal Mfg. Co.

Caster & Curran
 (Solidation Co.)
 Davis Coal & Coke Co.

Chemists.
 Simonds & Wainwright.

Chilled Castings.
 Whiting Foundry Equipment Co.

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

Compressors.
 Clayton Air Compressor Works.
 Norwalk Iron Works Co.

Concentrators, Crushers, Pulverizers, Separators, Etc.
 Allis, Ed. P., & Co.
 Beckett Foundry & Machine Co.
 Blake, Theo. A.
 Boston Ore Machinery Co.
 Bradley Pulverizer Co.
 Colorado Iron Works.
 Denver Eng. Works Co.
 Dodge Mining Machinery Co.
 Engelbach Mach. Mfg. Co.
 Fraser & Chalmers.
 True Vanner Concentrator.
 Hendrie & Bolthoff Mfg. Co.
 Joplin Mach. Co.
 Krom, S. B.
 Krupp, F.

Link Belt Machinery Co.
 McCully, R.
 Seville, H., & Co.
 Stedman Foundry & Mach. Co.
 Walburn-Swenson Mfg. Co. (See Machinery.)

Copper Dealers and Producers.
 American Metal Co.
 Arizona Copper Co.
 Atlantic Mining Co.
 Balbach S. & Ref. Co.
 Baltimore Cop. Wks.
 Bath, H., & Son
 Boston Wont M Co
 Bridgeport Copper Co.
 Butte & Boston M. Co.
 Canadian Copper Co.
 Copper Queen Mfg. Co.
 Detroit Copper Co.
 Elliott's Metal Co., Ltd.

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

Cranes
 Whiting Foundry Equipment Co.

Crucibles, Graphite, Etc.
 Denver Fire Clay Co.
 Dixon, Jos. Crucible Co.
 D'Este & Seelye.

Cyanide.
 Roessler & Hasslacher Chemical Co.

Diamonds
 Bishop, Victor, & Co.
 Lexow, Theodor.

Diamond Drills
 Bishop, Victor, & Co.
 Bullock Mfg. Co., M. C.
 Lexow, Theodor.
 Sullivan Machinery Co. (See Air Compressors and Rock Drills.)

Draughtsmen.
 Young, Wm. E.

Drawing Materials
 Besley, Chas. H., & Co.
 Dietzsch, E., & Co.
 (See Engineering Instruments.)

Dredges
 Bucyrus Steam Shovel & Dredge Co.
 Marion Steam Shovel Co.
 Southern Co.

Dryers.
 Brown, Horace T.
 Cummer, F. D., & Sons Co.
 Denver Eng. Wks. Co.

Dump Cars
 Denver Eng. Works Co.
 Hendrie & Bolthoff Mfg. Co.

Educational Institutions
 Arizona School of Mines.
 Columbian University.
 Chicago School of Assaying.
 Correspondence School of Mines.
 Lehigh University.
 Mass. Inst. of Technology.
 Michigan Mining School.
 Rose Polytechnic Institute.

Electrical Batteries
 Macbeth, James, & Co.

Electrical Machinery and Supplies
 Besley, Chas. H., & Co.
 Card Electric Co.
 Denver Eng. Wks. Co.
 Electrical Engineering Co.
 General Electric Co.
 Jeffrey Mfg. Co.

Elevators, Conveyors and Hoisting Machines
 Brown Hoist & Conv. Mach. Co.
 Caldwell, H. W., & Co.
 California Wire Wks. Co.
 Cooper, Hewitt & Co.
 Crook, W. A., & Bros. Co.
 Denver Eng. Wks. Co.
 Electrical Engineering Co.
 Field & Goetzman.
 Fraser & Chalmers.
 (See Wire Rope Tramway and Machinery.)

Emery Wheels
 Besley, Chas. H., & Co.
 New York Belting & Packing Co., Ltd.

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

Engineer's Instruments and Supplies.
 Buff & Berger.
 Bullock & Crenshaw.
 Dietzsch, F., & Co.
 Fauth & Co.
 Gurley, W. & L. E.
 American Engine Co.
 Buckeye Fuse Co.
 Bullock, M. C. Mfg. Co.
 Enterprise Boiler Co.
 Ellison, Wm., & Son.
 Fraser & Chalmers.
 Heine Safety Boiler Co.
 Lidgerwood Mfg. Co. (See Machinery.)

Excavators
 Bucyrus Steam Shovel & Dredge Co.
 Marion Steam Shovel Co.
 Southern Co.

Fire-Brick and Clay Furnaces
 Chur, A. T.
 Kurnaces
 Brown, Horace.
 Dodge Mining Mach Co.
 Hoskins, Wm. (See Machinery.)

Fuses, Powder
 Ingersoll-Sergeant Drill Co.

Fuse, Safety.
 Clinch Fuse Co.

Gas Engines.
 Norman, J. J., & Co.

Gas Works
 Pollock, Wm. B. & Co.
 Wood, R. D., & Co.

Gauges & Recording, Etc.
 Bristol Mfg. Co.

Gearing
 Besley, Chas. H., & Co. Denver Eng. Wks. Co.
 Chester Steel Cast. Co. Fraser & Chalmers.
 (See Machinery.)

Grease, Graphite, Etc.
 Besley, Chas. H., & Co. | Dixon, Jos. Cruc. Co.

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Heavy Machinery
 Denver Eng. Works Co.
 Fraser & Chalmers.
 Heine Safety Boiler Co.
 New York Belting & Packing Co. Ltd.

Injectors.
 Fenberby Injector Co.

Insulated Wires and Cables
 Okonite Co., Ltd. The

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

Joint Fittings
 Tight Joint Co.

Lead Linings for Chlorination Tubs.
 Raymond Lead Co.

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 General Electric Co.
 Hunt, C. W. Co.
 Porter, F. R., & Co.

Lubricators.
 Detroit Lubricator Co.

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Allis, Edw. P., & Co.
 Bacon, E. C.
 Backett & Mich. Co.
 Besley, Chas. H., & Co.
 Blake, T. A.
 Boston Ore Mach'y Co.
 Bradley Pulverizer Co.
 Buckeye engine Co.
 Bullock, M. C., Mfg. Co.
 Caldwell, H. W., & Co.
 Card Electric Co.
 Carpenter, Geo. B., & Co.
 Channon, H. C., & Son.
 Colorado Iron Works.
 Connorsville Blower Co.
 Crandall & Huff.
 Crook, W. A., & Bros. Co.
 Davis-Colby Ore R. Co.
 Denver Eng. Wks. Co.
 Dodge Mfg. Mach. Co.
 Ellison, Wm., & Son.
 Engelbach Ma. Mfg. Co.
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 Ingersoll-Sergeant Drill Co.
 Jeffrey Mfg. Co.
 Jessop, W., & Sons, Ltd.
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Manganese Steel.
 Taylor Iron & Steel Co.

Metal Dealers
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 American Metal Co.
 Am. Zinc Lead Co.
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 Bath, Henry & Son.
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 Bridgeport Copper Co.
 Cookson & Co.
 Elliott's Metal Co., Ltd.
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 Denver Eng. Wks. Co.
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 Sheffield Car Co.
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 Atlantic Mfg. Co.
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 Boston & Mont. Mfg. Co.
 Butte & Boston Mfg. Co.
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Ore Roasters
 Brown, Horace T.
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 Brandt, Randolph.
 Jenkins Bros.
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 Roessler & Hasslacher Chemical Co.

Phosphor-Bronze
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Pile Drivers
 Bucyrus Steam Shovel and Dredge Co.
 Ingersoll-Sergeant Drill Co.

Pipes
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Powder
 Atlantic Dynamite Co.
 Atna Powder Co.
 Ingersoll-Sergeant Drill Co.

Pressure Blowers
 Connorsville Blower Co.

Pressure Regulators
 D'Este & Seelye. (Curtis.)

Publishers
 American Fertilizer Arms & Explosives.
 Australian Mg. Stand. Bulletin.
 Colliery Guardian.
 Denver Republican.
 Economic Mining.
 El Minero Mexicano.
 Electrical Plant & Electrical Industry.
 Pumps.
 Blake, Geo. F. Mfg. Co.
 Cameron, A. S., & Co.
 Pump Works.
 Denver Eng. Wks. Co.
 Fraser & Chalmers.
 Goulds Mfg. Co.

Quarrying Machines
 Ingersoll-Sergeant Drill Co.
 Rand Drill Co.
 Sullivan Machinery Co.

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Railroads
 Chicago & N. West. R. R.
 C. B. & Quincy R. R.
 Denver & Rio Grande R. R.
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 Illinois Central R. R.
 Midland R. R. of Kentucky.
 Rio Grande Southern R. R.
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Railroad Supplies and Equipment
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 Channon, H. C.
 Crandall & Huff.
 Fairbanks Co. (See Machinery.)

Registers, Dampers, Hints, Etc.
 D'Este & Seelye Co.
 Eddy Valve Co.
 Jenkins Bros.

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 D'Este & Seelye. (Curtis.)

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 Cincinnati Corrugating Co.
 Phoenix Dodge & Co.
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 Fairbanks Co.

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Smelting and Refining Machinery
 Robinson & Orr.

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 Connorsville Blower Co.
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 Baltimore Cop'r Wks.
 Bridgeport Copper Co.
 Canadian Copper Co., Ltd.
 Kan. City Sm. & Ref. Co.
 Mathison Smelting Co.
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 Carpenter Steel Co.
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 Chrom's Steel Works.
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 Moore, S. L., & Sons Co.
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 Carpenter Steel Co.
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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.

1447-WANTED-FOR A GOLD MINE in Georgia, competent assistant foreman; also nine miners experienced in the use of power drills as head men; chance for family without children to take charge of boarding house for 40 men; references required; state wages expected for steady work. Address GOLD STAR, ENGINEERING AND MINING JOURNAL.

1448 WANTED.-A CHEMIST WELL UP in the manufacture and analysis of salts. State age, experience and salary expected. Address SODIUM, ENGINEERING AND MINING JOURNAL.

1449 WANTED-ASSAYER AND CHEMIST at gold mine using cyanide process. Have references and experience. Address C. N., ENGINEERING AND MINING JOURNAL.

1453 WANTED A COMPETENT MAN TO take charge of sulphuric, nitric and muriatic acid departments; state age and experience. Address MODERN, ENGINEERING AND MINING JOURNAL.

1456 WANTED-A DRAUGHTSMAN WHO has had experience in designing and building blast furnaces. State qualifications, references, etc. Address P. Z., ENGINEERING AND MINING JOURNAL.

1457 WANTED-FOR FREE MILLING and smelting property (gold) near Prescott, Arizona, competent mine superintendent who can make his own assays and run his own levels; must have gilt-edged references; developed property. Address FREE MILLING, ENGINEERING AND MINING JOURNAL.

1458 WANTED-QUARRY FOREMAN, A hustler, for Canada. State experience, wages expected (common labor is \$1 per day), etc. Address A. A. C., ENGINEERING AND MINING JOURNAL.

1459 WANTED-A FIRST-CLASS ASSAYER and thorough ore sampler to take charge of a branch office in the Mexican Republic, through which ores are purchased and bullion sold, and a general mining and milling supply business done. Promptness, system, accuracy and thoroughness essential qualities. Address CARBON, ENGINEERING AND MINING JOURNAL.

1460 WANTED-MINE SURVEYOR AND general assistant at engineering, by large mining and smelting company in Mexico; climate healthy. Address OZONE, ENGINEERING AND MINING JOURNAL.

1461 WANTED-A MAN WHO HAS HAD practical experience in treating gold and silver ores and is competent to make accurate assays. Address LUZERNE, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

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

POSITION WANTED AS ASSAYER AND assistant by young graduate who is at present employed in Colorado gold mine. Considerable practical experience, and has studied abroad. Can survey, keep books and is familiar with cyanide process. Speaks French and some Spanish. Best of references. Address I. S., ENGINEERING AND MINING JOURNAL. No. 17,499 May 30.

MINING ENGINEER, GRADUATE, AGED 28, static, would like a position as assistant manager or superintendent in charge of mines or reduction works. Salary no object. Best references. Address MINING, ENGINEERING AND MINING JOURNAL. No. 17,407, May 30.

CHEMIST (AGE 30), EXPERIENCED IN EXPERIMENTAL station work and in control and running of fertilizer factory, desires position. Can design and erect small fertilizer factory. Best references. Address Box 1,592, ENGINEERING AND MINING JOURNAL. No. 17,410, May 30.

A MILL MAN, WITH 14 YEARS' PRACTICAL experience with the chloridizing and leaching of silver ores in Mexico and United States, is now open for engagement. A references. Address J. H. J., 837 18th St., Denver, Colo. No. 17,419 June 13.

EXPERIENCED, ACCURATE, DOUBLE ENTRY bookkeeper, stenographer and typewriter, familiar with details of mining-office work, is open for engagement. References. Address W. R., 1645 C'ampa street, Denver, Colorado. No. 17,450, May 30.

CHEMIST AND METALLURGIST, WITH many years' experience, is open for engagement. Would like position as chemist or superintendent of smelting works, chloridization or cyanide mills. First-class references. Address M. A. M., 203 Boston Building, Denver, Colo. No. 17,417, June 13.

A METALLURGIST, LEAD AND COPPER, in charge of large works in Mexico, wishes engagement with reliable company in the States. Successful experience. Best references. Address MEXICO, ENGINEERING AND MINING JOURNAL. No. 17,413, June 27.

EXPERIENCED, PRACTICAL, ACCURATE Chemist and Metallurgist wishes position as Chemist or Assistant in acid works, smelting works, steel works, or blast furnace. Low salary. Address PRACTICAL, ENGINEERING AND MINING JOURNAL. No. 17,418, May 30.

WANTED.-TRAVELING SALESMAN ACQUAINTED in most of the large metal-working and machine works in the Middle and Southern States, is open for engagement. Address ROAD SALESMAN, ENGINEERING AND MINING JOURNAL. No. 17,421, June 6.

WANTED.-A SALESMAN, WELL UP IN gas works, water-works, railroad and machinery supplies of every kind, wants selling agency for Pennsylvania, New Jersey and Maryland, within a radius of 100 miles of Philadelphia. Address METALS, ENGINEERING AND MINING JOURNAL. No. 17,422, June 6.

YOUNG MAN, THIRTY YEARS OF AGE, desires position as foreman or assistant superintendent of copper or lead-silver smelter. Has practical knowledge of reverberatory and blast furnace work; practical builder of both furnaces. Address PRACTICAL, ENGINEERING AND MINING JOURNAL. No. 17,423, June 20.

Contracts Open.

TREASURY DEPARTMENT, OFFICE SUPERVISING ARCHITECT, Washington, D. C., May 19th, 1896.-Sealed proposals will be received at this office until 2 o'clock P. M., June 16th, 1896, and opened immediately thereafter, for all labor and materials required for the erection and completion of an operating wing to the U. S. Marine Hospital at Chicago, Ill., in accordance with the drawings and specification therefor, copies of which may be had at this office or the office of the Superintendent of Construction at Chicago, Ill. With each bid must be enclosed a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids or to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the Erection and Completion of an Operating Wing to the U. S. Marine Hospital, Chicago, Ill.," and addressed to Wm. Martin Hosok, Supervising Architect. Orig.

SIX-FT. STEEL CONDUIT.-Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, Ont., until June 3, 1896, for the work of laying the proposed new 6-ft. steel conduit, to replace the present wooden one, from the connecting crib on Toronto Island to the belle-buoy crib in Lake Ontario, a distance of about 2,358 lin. ft., including the laying of the necessary tanks, valves and connections. Drawings and specifications may be seen, and forms of tender obtained, at the office of the City Engineer, Toronto, Canada, on and after May 20, 1896. A deposit in the form of a marked check payable to the order of the City Treasurer, for the sum of 5% on the value of the work tendered for up to \$1,000, and 2 1/2% on the value of the work tendered for over that amount, must accompany each and every tender. Tenders must bear the bona fide signature of the contractor and his sureties, or they will be ruled out as informal. R. J. FLEMING, Chairman Board of Control.

WATER-WORKS.-Sealed proposals will be received by the Board of Water Commissioners of the Village of Angelica, N. Y., until June 3, 1896, for furnish the material and constructing a gravity system of water-works for said village. There will be required approximately the following: 680 tons (about 8 1/2 miles) of cast-iron pipe, 35 fire hydrants, 32 gate valves and boxes, concrete-lined reservoir of 1/2-million gallon capacity, receiving basin, etc. Bids will be received for furnishing any of the materials mentioned above or for constructing the work complete. Plans may be seen and specifications and blank forms of proposal procured at the office of the Secretary of the Board, Angelica, N. Y., or at the office of the Engineer, J. F. Witmer, Rooms 65 and 66, Chapin Block, Buffalo, N. Y.

WATER-WORKS.-Sealed proposals will be received by the Secretary of the Borough Council until the 4th day of June for the construction and furnishing of all material for the complete system of water-works. Each proposal must be accompanied by a certified check, and all proposals must be on blanks furnished, and shall be sealed and addressed to W. M. Hays, Secretary of Ligonier Council, Pa. Plans and specifications can be seen at the office of L. W. FOGG, Engineer, Latrobe, Pa., W. M. HAYS, Secretary.

ELECTRIC LIGHT PLANT.-The Common Council of the City of Millville, N. J., will at their meeting, to be held June 5, 1896, receive sealed bids for the erection of an electric light plant, with a capacity of running 100 arc and 1,000 incandescent lamps. The area to be covered to be 1 1/2 miles of wiring and poles. The bids are wanted with and without the brick building necessary for such a plant. The horse-power of engine to be not less than 200. Two boilers will be wanted. For further information, apply to N. P. HOWELL, Chairman Committee.

ELECTRIC LIGHT PLANT.-The Common Council of the City of Millville, N. J., will receive sealed bids until June 5th for the erection of an electric light plant with a capacity of running 100 arc and 1,000 incandescent lamps, the area to be covered to be 1 1/2 miles of wiring and poles. The bids are wanted with and without the brick building necessary for such a plant, the horse power of engine to be not less than 200. Two boilers will be wanted. For further information apply to N. P. HOWELL, Chairman Committee.

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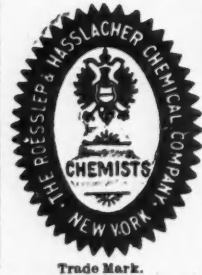
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