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AND
COAL

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THE ENGINEERING AND MINING JOURNAL has opened offices in Chicago, in "The Rookery," under the charge of Mr. GEO. S. SCOTT, who for some time past has been on the business staff of the JOURNAL, and for whom we bespeak the good will and courtesy of the business community.

We cordially extend the courtesies of our office to visitors to Chicago, and Mr. SCOTT will be pleased to afford them information of every kind in his power. Files of the ENGINEERING AND MINING JOURNAL and copies of the "Mineral Industry" and all the other publications of the Scientific Publishing Company can be obtained from Mr. SCOTT.

THE difference in the purchasing power of money between 1492 and the present day is illustrated by a calculation made by Prof. RUGE and published in a German paper. He says that the first expedition of COLUMBUS cost about $7,300 of our money, which seems a very moderate sum for the equipment of three vessels, small as they were. COLUMBUS, however, was paid as admiral only at the rate of $320 a year; his captains received only $16 a month, and sailors from $2 to $2.50. Other expenses, of course, were in proportion.

PLANS have been prepared for the electric transmission of power from Snoqualmie Falls to the city of Seattle, Wash. The falls, it is estimated, will furnish some 32,000 H. P. at all seasons of the year; the distance to Seattle is 24 miles in an air line, but nearly 40 miles by the most available route for a wire line. Seattle, it is said, has now about 40,000 people, is a manufacturing town with many miles of street railroad, and offers generally an excellent field for the sale of power. On the other hand coal of fair quality is very cheap, about $1.25 per ton in large lots, and the electric power must be furnished at a low rate. If the plan is carried out it will furnish an excellent test of the comparative commercial economy of electric transmission from a water power.

RECENT scientific discoveries have made possible the use of higher temperatures than had before been reached and the application of the electric current has given a degree of heat hitherto considered unattainable. In the opposite direction a French scientist, M. PICTET, has been experimenting and has succeeded in producing the extraordinary low temperature of 273° C.—491° Fahr.—below the freezing point, a degree of cold almost incalculable to our senses. The processes which he used and a few of the results which he obtained were briefly described in our last issue. These researches in the direction of both high and low temperatures are not simply matters of scientific curiosity, but are of substantial use, since they open new fields of chemical research and permit changes and combinations which have been considered possible but impracticable with the means at command.

THE large number of war ships assembled in New York for the naval review have given unusual opportunities of studying the varying practice of different nations in naval construction. As might be expected, nearly all the vessels are of the cruiser class, none of the European nations caring to subject their battle-ships to the risks of a spring voyage across the Atlantic. The only battle-ship properly so called present at the review is the Brazilian "Aquidaban," though the English "Blake" and the French "Jean Bart" are armored cruisers and formidable fighting ships. None of our own battle-ships or armored cruisers are as yet ready for service.

It is noticeable that the Italians, and to some extent the English, are the only naval powers which still adhere to very heavy guns. The others have felt the influence of the later tendency to smaller guns and especially to the use of rapid-fire guns; and also of the modern belief that maneuvering ability should not be sacrificed to mere weight of metal.

THE GEORGIA GEOLOGICAL SURVEY.

When Dr. J. W. SPENCER took charge of the Georgia Geological Survey three years ago, it was hoped by those who knew him and who knew also the value of the mineral resources of the State that the man and the opportunity had met. Dr. SPENCER was well qualified to fill the position, being a man of excellent scientific attainments, great energy and an overflowing enthusiasm for his profession. The State had been without a survey for several years, the report of Dr. GEORGE LITTLE never having been paid for and consequently never published. The ores of iron, gold and manganese, the deposits of coal, building stones, marls and phosphates, the water powers and timbers, and divers other things falling within the legitimate scope of the survey were left to work out their own salvation, while the Sub-Treasury schemes of the Farmers' Alliance were rampant from Catoosa to Camden.

Dr. SPENCER was anxious to show that the investment in the survey, was not only judicious, but, what is more, imperatively demanded, and he seems to have begun his work under circumstances as favorable as could be desired, with one important exception—he could neither appoint nor remove his assistants. Upon this single circumstance the survey has come to grief, as might have been expected. The Geological Board assumed to know a great deal more of the qualifications required in a

geologist than Dr. SPENCER did, and appointed wholly incompetent persons. One of these made a report which was sent to Dr. EUGENE A. SMITH, State Geologist of Alabama; Prof. JOSEPH A. HOLMES, State Geologist of North Carolina: and J. K. GILBERT, Chief Geologist of the United States Survey, for criticism, and which they all agreed in pronouncing worthless, Professor HOLMES saying that he would be ashamed of any elementary student who made such gross and inexcusable blunders, and Mr. GILBERT that the apparent ignorance of the author as to mineralogy, lithology and geognosy throws doubt on most of the statements. The Board, instead of dismissing the incompetent man, finally asked for the resignations of all the geologists, including Dr. SPENCER.

The State of Georgia is rich in many minerals, and needs a good geological survey, but no satisfactory work can possibly be accomplished under the present conditions. The essential thing for the legislators to understand is the great benefit the State will derive from a geological survey, in calling attention to its vast mineral resources, then to select a competent director for the survey and allow him to direct, selecting his own subordinates and making him alone responsible for the result. In no other way can efficient work be done.

SEGREGATION IN METALS.

Apropos of our editorial of last week on the need of standard methods of sampling and analysis there is in the "Journal of the Society of Chemical Industry" (Vol. XII., No. 3, March 31st, 1893, pp. 236–239) an important contribution from Mr. T. W. HOGG. After noticing ABEL'S discovery of the extrusion of globular sulphide of iron from pig iron, and that the greater amount of phosphorus in phosphoric pig iron was in the portion that solidified last, Mr. HOGG proceeds to give the results of his examination of a large cylindrical ingot of mild steel. The weight of the ingot was 24,752 lbs., with a length of 10 ft. and a diameter of 30 in. Drillings from the face of the top part had the following composition:

	Center.	1 in. from center.	Near edge.
Iron	98·40	98·60	99·30
Manganese	0·27	0·25	0·20
Carbon	0·75	0·58	0·20
Silicon	0·042	0·034	0·03
Sulphur	0·15	0·12	0·036
Phosphorus	0·20	0·10	0·042
Copper	0·052	0·052	0·054
Total	99·864	99·736	99·862

Drillings from the bottom portion showed very slight variations as between corresponding spots in the top. What is remarkable in these analyses is the great difference in the content of carbon, sulphur and phosphorus. The center of the ingot contained 0·75 per cent. carbon, and the portion near the edge, 14 in. away, had only 0·20 per cent., a reduction of 0·55 per cent., or 73·31 per cent. As between the center and 1 in. from the center there was a difference of 0.17 per cent., or 22·67 per cent., which, subtracted from the total difference of 73·31 per cent., leaves 50·64 per cent. reduction between the spot 1 in. from the center and the spot near the edge. The reduction of the carbon proceeded, therefore, with the greatest rapidity within the area bounded by a circle of 2 in. diameter and one of, say, 14 in.

As between the center and the edge there was a reduction in the sulphur of 0·114 per cent.—that is, from 0·15 to 0·036, or 75·9 per cent., and between the center and an inch away of 0·03 or 20·0 per cent. As concerns the phosphorus, the difference between the center and the edge was 0·158, or from 0·20 to 0·042, which is a reduction of 78·9 per cent.

The reduction of the carbon, sulphur and phosphorus falls in each case between 73 per cent. and 79 per cent. of the content at the center, and the closeness of these several results would seem to point to some connection between these elements, at least to this extent, that whatever has influenced the carbon has at the same time, and to about the same extent, influenced the sulphur and the phosporus. Drillings that were taken from the center of the top portion upward for 11 in. to the contraction cavity, others taken 1 in. from the center, and a third lot downward through the center of the middle portion for 20 in., and analyzed for carbon, did not show any important variations, and so were not analyzed for sulphur and phosphorus.

Mr. HOGG concludes that "the central core of impure metal is of an elongated character and not abrupt, a condition which only takes place rarely and under circumstances not quite understood." In seeking to explain the segregation of impurities in large ingots he thinks that under the influence of the long soaking heat which they undergo upon reheating "there is a *partial reabsorption of the impurities* (the italics are his), and when there has been a case of abrupt segregation this reabsorption will be of the most pronounced character: the result of this will be that the molecular continuity of the crystals of stronger metal will be interrupted by the gradual penetration of the more fusible sulphide and phosphide of iron; and not only this, there is very great probability that a more decidedly crystalline structure will be induced, with the result that the steel becomes thoroughly rotten at this point, and is liable to break upon the slightest provocation." Mr. HOGG quotes an analysis of a cake that was found at the bottom of a cavity in a Bessemer steel casting of seven tons weight, made at La Louvière, Belgium, in 1891. The compositions of the interior of the roll 12 in. below the cavity, of the undersurface of the cavity supporting the cake, and of the cake itself were as follows:

	C.	Si.	P.	S.	Mn.
Interior of roll	0·309	0·252	0·077	1·055	0·96
Cavity below cake	0·68	0·325	0·318	0·325	1·49
Cake itself	1·274	0·41	0·752	0·418	1·08

In this case the cake contained more than four times as much carbon as the interior of the roll, more than 1½ times as much silicon, and nearly 10 times as much phosphorus, while the sulphur was diminished by 60·2 per cent., and the manganese remained without material change, increasing only 12·5 per cent., or from 0·96 to 1·08.

Attention is drawn also to the composition of the little globules sometimes found on the outside of steel castings. Some of them are covered with a white coating, which is almost chemically pure silica, and they contain as much as 5·24 per cent. of combined carbon, giving a white spiegel-like fracture. Some others are flattened out under the hammer, have a dark graphite fracture and contain 2·54 per cent. of graphitic carbon with traces of combined carbon and 0·14 per cent of phosphorus, while the casting itself contained 1·90 per cent. graphitic and 0·35 per cent. of combined carbon with 0·05 per cent. of phosphorus. Certain fine-grained patches on the fractured surface of pig iron were found to differ from the body of the pig only in having a good deal less combined carbon.

Mr. WALTER E. KOCH, in a paper recently read before the Engineers Society of Western Pennsylvania, makes some pertinent observations on the segregation of impurities in steel. He noticed, 20 years ago, that in open-hearth steel rails there was sometimes a segregation of the phosphorus, while the carbon, sulphur and manganese remained practically unchanged. Thus at the surface the carbon was 0·13, phosphorus 0·28, sulphur 0·06, manganese 0·60. At a depth of one inch from the surface the carbon was 0·15, phosphorus 0·46, sulphur 0·06 and manganese 0·62.

In a plate rolled from a slab hammered out of an ingot about 18 in. thick he found that the carbon varied from 0·07 to 0·13, phosphorus from 0·04 to 0·06, sulphur 0·08 to 0·150, and manganese 0·60 to 0·68. This plate cracked after it was built into a boiler.

He found, also, on pursuing the matter, that in plates rolled from large ingots, there was a distinct segregation of carbon, phosphorus and sulphur at the center of the plate. The variation, both in composition and properties, was especially marked in plates over 1 in. thick. In a boiler plate 1½ in. thick, rolled from a slab 8 in. thick, which had been hammered down from a 20-in. ingot, there was a place in the center that would not bend at all, but was quite brittle. No analysis is given, but he says that another plate whose edge had carbon 0·15 and phosphorus 0·045, had at its center carbon 0·22 and phosphorus 0·07. A piece cut from the center would not bend, but broke. Of all the metalloids present in steel he thinks that carbon shows the greatest tendency to change its position within the ingot or plate.

A very extraordinary circumstance was narrated by Mr. KOCH as having recently come under his own personal observation. An ingot weighing 600 lbs. and measuring 18×7 in. had a little nail or knob left on the bottom. The cast was made on Monday, and on Thursday, when the ingot was dead cold, the knob was knocked off. As soon as it was struck it flew off with a loud report like a gun and a jet of blue flame shot out. The flame had a yellow top, and on burning became yellower and shorter, finally going out, after a half minute, and there was a little cavity at where the knob had been. Mr. JAMES CAMP, in commenting on this, said he had seen a similar case. A dead cold ingot, after it had lain on the ground a week or more, was put into the skull cracker and broken. It contained gas which was ignited by a hot piece of metal falling into it and burned.

It is much to be regretted that no analyses of these ingots or of the portions inclosing the gas were made. We might expect some light on the subject of segregation if every circumstance bearing upon it were carefully investigated.

Mr. HOGG gives also some assays of pig lead and rich antimonial lead, showing what differences may arise according to the method and place of sampling. The top and bottom samples were taken 1½ inch from the outside surface, and in one case the difference in silver was 23 ounces, 3 pennyweights, 20 grains, in another 54 ounces, 7 pennyweights, 14 grains, and in another 32 ounces, 13 pennyweights, 16 grains between the top and bottom, while the assays of the samples from the middle of the pig were at variance with those from the top and bottom. In fact, the nearest agreement of analyses of the same pig was in the case of pig C, where the assay of the middle gave 136 ounces, 7 pennyweights, 16 grains, and from the bottom 139 ounces, 9 pennyweights, 16 grains.

In a rich antimonial lead he found the silver on top 50 ounces, 13 penny weights, 23 grains; in the middle, 39 ounces, 4 pennyweights; in the bottom, 55 ounces, 3 pennyweights, 2 grains.

In view of these facts and scores of others that might be quoted, the

necessity for standard methods of sampling commercial products becomes daily more evident. When the same bar of pig lead will show a difference of over 54 ounces of silver per ton, according to where it is sampled, comment is unnecessary.

NEW PUBLICATIONS.

REPORT OF THE DEPARTMENT OF MINES, NOVA SCOTIA, FOR THE YEAR 1892. By Edwin Gilpin, Jr. Halifax, N. S. Queen's Printer. Pages 72.

A large part of the value of government statistical reports lies in the promptness with which they are issued, and for this reason, if no other, Mr. Gilpin and the Nova Scotia Mines Department are worthy of high praise; for the above-mentioned report was published within three months after the expiration of the year for which statistics are given. Although certain data, such as the values of the different products, are lacking, the report bears on its face the evidences of careful and conscientious preparation, which adds to the value of its timely appearance. From the figures given we learn that the year in question was but moderately prosperous, for while there was a notable increase in the output of iron ore and coke made there was an equally marked decrease in the output of gold, copper ore and coal, as compared with the figures for 1891. Thus gold showed a decrease from 23,391 oz. in 1891 to 19,998 oz. in 1892, coal from 2,044,784 tons in 1891 to 26 1,942,780 tons in 1892, and copper ore from 900 tons in 1891 to 26 tons in 1892. The output of iron ore increased from 57,311 tons in 1891 to 75,000 tons in 1892. The report contains many tables, giving details of work in the various districts, as well as the separate reports of the deputy inspectors. There is also included an abstract of the report of the Austrian Firedamp Commission, and an account of precaution that may be taken against accidents arising from firedamp.

ALTERNATING CURRENTS OF ELECTRICITY: THEIR GENERATION, MEASUREMENT AND APPLICATION. By Gisbert Kapp, C. E.; with an introduction by William Stanley, Jr. New York: The W. J. Johnston Company, Limited. Pages 166; illustrated. Price $1.

The recent developments of alternating currents of electricity, and the importance of their use in the transmission of power, make the subject an interesting one, but most of the writing upon it so far has been of a strictly technical and rather abstruse kind, which could be understood only by those thoroughly versed in the science. The present book treats the subject in a more popular way, clearing off some of the mystery which has surrounded it, and avoiding as far as possible, the use of mathematical formulas. The book treats in order alternating currents and their measurement; the principles and designs of alternating current machines and transformers; alternating central stations; parallel coupling of alternators; the various forms of alternating motors, and multi-phase motors. The last-named subject, a somewhat difficult one, is so treated as to enable the reader to get a fair general idea of this class of machines.

The subject throughout is handled in a very practical way, and with as little technicality as possible. The book ought to be a useful one to the student, and certainly acceptable to the large class of engineers and others who wish to have a general idea of electric machinery and its principles, but have not the time or opportunity to become accomplished electricians.

CANON, TORPILLES ET CUIRASSE: LEUR INSTALLATION ABORD LES BATIMENDS DE COMBAT. Par A. Croneau, Ingénieur des Constructions Navales. Paris, 1893: G. Masson. Pages, 208. Illustrated.

It is not often one finds so much valuable information condensed in so small a compass as in the two hundred pages of the volume before us. The field covered is a wide one, but the author has succeeded in giving us, within the limits mentioned, a very clear idea, on the one hand, of the character, disposition and employment of artillery on shipboard; the preparation and care of ammunition; the use of the ram; of torpedoes and high-explosive projectiles—in short, of all the offensive means employed in naval warfare; while, on the other, we have an equally clear statement of the devices for the defense of the warship, its guns, machinery and personel, by the use of armor and other auxiliary defensive means.

It is to be noted that the author is in accord with the later ideas regarding the advantage of medium calibres for naval guns; of the necessity for giving more protection to the gun and its gunners than that afforded by the open barbette mount; also that provision must be made for maneuvering guns by hand power—that it is no longer safe to trust the efficiencies of the limited armament of a warship wholly to machinery, which a shell fragment may derange and put out of action. Thanks to improved methods of mounting, this can now be accomplished. The author also points out the great advantage of electrical over hydraulic or other machinery for traversing turrets, pointing guns, etc., both in diminished weight, economy of space and the ease with which the change can be made from mechanical to hand power and the reverse. It is evident that the value of electrical power on board of the modern ship of war is just beginning to be appreciated, and that it is bound in the near future to drive out the comparatively clumsy devices heretofore employed. The illustrations are not numerous, but quite sufficient to clearly explain the text.

A MANUAL OF MACHINE DRAWING AND DESIGN. By David Allan Low and Alfred William Bevis. London & New York: Longmans, Green & Co. Pages 376; illustrated. Price $2.50.

Machine drawing and design are so closely associated that it is somewhat difficult to make a book on one without the other. Nevertheless, they ought to be separated, or rather the book on design should be the second volume of that on drawing. The book before us has an introductory chapter on drawing, but is chiefly devoted to machine design, and is better fitted for those who have already gained some practical knowledge of the draughtsman's art, than for new beginners. The opening chapter gives some concise directions as to the use of the drawing board and tools, a few geometrical problems and some hints as to marking and lettering drawings; but it occupies only 20 pages of the book, and in half a dozen of those hurries the reader on from the bisection of angles and the construction of a polygon to the plotting down of the parabola and the epicycloid and the drawing of a screw-thread and a spiral spring. This chapter is entirely too short, and would be more apt to puzzle than to help a student who had no previous instruction. As a simple opening or introduction to a book on design it would answer, but as part of a book on drawing it is not sufficient. It is supplemented, however, to some extent by directions and hints in other parts of the book. The truth is, as most old draughtsmen know, that the really good elementary treatise on mechanical drawing is still to be written—perhaps drawn would be the better term. A number of such books have been published, but none of them are really practical. Most of them are filled up with abstruse problems and difficult constructions which the average draughtsman will never meet with in practice, and miss the lesser questions which he will continually find arising in his daily wark. This is not intended to apply to the present book, which, as we have said, has really very little in it about elementary drawing at all; it is only the expression of a wish for a book which is really needed.

Passing on from the introduction, the chapters on design merit much commendation. The style has generally the merit of condensation and clearness, and the rules are concisely and plainly expressed. Numerous examples of construction are given to illustrate the text, and in general recent practice is noted and explained. The chapters on transmission machinery, especially on rope gearing and friction gearing, are very good, although that on toothed gearing can hardly be said to do much toward clearing up that subject, which has been involved by many writers in an altogether unnecessary cloud of difficulty. There is, indeed, all through a little too much flavor of the school room and not quite enough of the machine shop. There are some defects of arrangement which might be pointed out, as, for instance, where valves of all kinds are put in one chapter, which treats of the engine slide-valve and of pump valves, of piston valves and ordinary globe-valves or cocks in a somewhat indiscriminate fashion. But little, in fact, is said of the slide valve, and practically nothing on the important subject of valve motions. It is true that valve motions would easily make a book by themselves, but it seems hardly right to pass them over altogether in a work on machine design. The only reference to valve motion or adjustment is in two or three pages on the Zeuner diagram, which is not, we think, approved or accepted by the best practical authorities. The chapter on boilers would have been improved by some reference to the Belpaire boiler, to the Serve ribbed tube and to some of the recent forms of water-tube boilers, as the Belleville, the Sterling and others; and the authors have evidently gone back some years for their authorities when they give the usual working pressure on locomotive boilers at "140 lbs. for simple engines, and 175 lbs. for compound engines." For the present day 160 to 175 lbs. for the former, and 170 to 190 for the latter would have been better, if indeed there can be said to be any rule at all for the compound locomotive.

Naturally, the book follows English practice chiefly, though there are quite a number of references to American practice. Little or nothing is said of French or German methods. The differences between the English and American practice, and the preference for the former, are especially to be noted in the chapters on connecting rods, or riveted joints, and on screw-threads, where the Whitworth is preferred to the Sellers' thread, as was to be expected. While a large number of detailed drawings are given, the only complete machines are a compound and a triple-expansion marine engine. A minor defect to be noted here is the small size of the page, which has made it necessary to reduce some of the drawings too much in size. It would be better to adopt a larger page, even at the risk of making a book of inconvenient size.

We have pointed out faults in the book, but we do not by any means intend to say that it has not some merits also. Some of these we have already referred to. It occupies a place between an elementary textbook and an elaborate treatise on design, and will be useful both in a course of instruction for the student and as a reference book for the engineer.

BOOKS RECEIVED.

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

The Mineral Waters of Canada. By H. Peareth H. Grumel, F. G. S. A. Ottawa, Canada: Printed for the Author. Pamphlet, 32 pages.

Foreign Office Diplomatic and Consular Reports on Trade and Finance. Annual Series, 1893. Nos. 1161-1167. London, England.

Foreign Office Reports on Subjects of General and Commercial Interest. Miscellaneous Series, 1893. Nos. 281 *and* 282. London, England: H. M. Stationery Office.

Les Mines, Les Minières et les Carrières. Par A. Badoureau et P. Grangier. Paris, France: Ancienne Maison Quantin; May & Motteroz, Directeurs. Pages, 330; illustrated.

Handbook of the American Republics; Bulletin No. 50; *January*, 1893. Washington. Published by the Bureau of the American Republics. Pages, 60; illustrated.

La Science Experimentales. Par A. Badoureau Ingenieur au Corps des Mines. Paris, France: Ancienne Maison Quantin; May & Motteroz, Directeurs. Pages, 260; illustrated.

Reports of the Department of Mines of Nova Scotia for the Year 1892. Hon. Charles E. Church, Commissioner of Public Works and Mines. Halifax, N. S.: Queen's Printer. Pages, 72.

Lake Superior Iron Ore Production for the Past 36 *Years; together with Receipts at Lake Erie Ports and Amount on Dock for the Past* 9 *Years.* Cleveland, O. The *Iron Trade Review.* Pamphlet, 36 pages.

Alternating Currents of Electricity: Their Generation, Measurement, Distribution and Application. By Gisbert Kapp, C. E. With an introduction by William Stanley, Jr. New York: The W. J. Johnston Co., Limited. Pages, 166; illustrated. Price, $1.

CORRESPONDENCE

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

The Egypt Coal Mine, North Carolina.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Allow me to amend the statement on page 344 of the "Engineering and Mining Journal," issued April 15th., in relation to the coal seam at Egypt, N. C. A section which I obtained at this mine a year ago in the main workings shows: 1. Slate roof; 2. Good coal (upper bench), 4 ft.; blackband, 1 ft. 6 in.; good coal (lower bench), 1 ft. 8½ in.; bony, dirty coal, 4 in. The upper bench is the only one worked. The dip of the seam is about 12° S. 6° E.

CHAPEL HILL, N. C., April 22d, 1863. H. B. C. NITZE.

Standard Methods for Metallurgical Chemists

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: We have read with much interest your editorial in last week's issue of the "Journal," in which you suggest that an association of metallurgical chemists be formed, whose committees shall recommend standard methods of sampling and analysis. It is a fact that, while many excellent articles have appeared descriptive of improved and shortened methods of analysis, but little has been written on the very important preliminary operation of sampling. We think that not only should the chemists agree among themselves upon standard methods of sampling, but they should provide their clients with descriptions of such methods. They should urge upon them the importance of sending carefully drawn samples instead of a single piece of ore, or, perhaps, a single chip of metal, as they too often do. The results of the most carefully conducted analysis or assay of these unreliable samples are generally misleading, and frequently result in much mischief. This, of course, is not the fault of the chemist, as all he can do under the circumstances is to report what he finds in the sample submitted, with, perhaps, a word of caution as to the danger of drawing conclusions from small and probably non-representative samples. Even though the hoped-for concerted action of the chemists is not taken, we trust that the prominence which you have given to this subject will lead those who contemplate sending samples either to have the same drawn by a competent person or else to obtain from the chemist advice as to how they should be taken. In suggesting this we have in mind particularly those inexperienced in mineral and metal matters, but, at the same time, there can be no doubt that much good would result from a comparison of methods by those who have given careful attention to the subject.

Another matter which we think should be considered by the proposed association is the method of reporting results of analyses and assays. We see no reason why the present nearly general practice of reporting "copper, by electrolytic assay," equivalent to "copper, by American fire assay," should not be extended to other determinations so far, at least, as to state the method of analysis employed. One advantage of this method would be that in comparing results obtained on the same lot of material by different chemists, the uncertainty as to the methods employed would not exist, and any discrepancy in such results would be known to be due to either the "personal equation" of the chemist, to which you referred, or to a difference in the samples tested. We think that if this practice was adopted a general agreement upon standard method of sampling and analysis would naturally follow.

104 JOHN ST., NEW YORK, April 24. RICKETTS & BANKS.

Ex lorin Gold Placers.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: An editorial in your issue of January 14th, 1893, cited the exploitation of a Venezuelan placer deposit of vast size and great asserted value, that cost $100,000, and had had $100,000 of plant sent out to it, to install it. You justly criticised, among other things, the want of a thorough sampling of the ground to determine its value per cubic yard before initiating such expensive developments. This case is in strong contrast with another instance (in Peru) related in the "Engineering and Mining Journal" of September 5th, 1891, p. 63, where the engineer was wisely permitted by the capitalists to make a most exhaustive survey and test of the actual value of the gravel by hundreds of prospect holes and hundreds of cubic yards of samplings, all located, measured, panned or worked in rockers with quicksilver, the amalgam treated with nitric acid, the gold weighed and assayed. In this case the preliminary report of the engineer had almost the reliability of a mathematical demonstration. It would interest your readers to know the outcome of this careful sampling. Were the Peruvian placers worked and well managed, and did they sustain the engineer's predictions? This model exploration was rendered costly by being done by hand and without the facilities available in the United States. Cannot some of your placer mining engineer friends contribute other instances of systematic sampling, over the whole area to be worked and from grass roots down to bedrock, done more cheaply and quickly by well boring or drilling machinery? Why not call the attention of driven, artesian and petroleum well borers to the possibility of establishing a profitable new line in their business: Exploring gravel claims by contract?

The usual way, as an old placer worker recently expressed it, is this: "The Eastern tenderfoot first buys his mine; gets stuck, and then calls on the engineer to get him out." The problem is, to keep him out by an expenditure that no conservative capitalist can reasonably object to. As an illustration, take a case in hand. A long distance from any railroad station there is said to exist a very rich deposit of auriferous gravel with abundance of water, timber, dumpage, etc. But the richest ground is low lying, and very wet, and the bedrock is from 25 to 100 ft. or more below the surface and the lip of rock over which the stream falls some 14 ft. vertically below. The plant needed includes a cheap portable sawmill to make sluice boxes, etc., for prospecting, and also a cheap portable boring machine that will rapidly bring out samples from surface to bedrock. If it brings away the water too all the better, in case of "flour gold." Such a machine would determine quickly and cheaply, and better too than any mining engineer's mere expertness, the essential questions in placer mining, the value per cubic yard, the lay of the bedrock and how to drain or tunnel.

The asking of these questions through your widely circulated columns will elicit many valuable answers for the guidance of the numerous engineers now in the field endeavoring to find safe investments for the rapidly increasing number of capitalists allured to this line of investment by the asserted scarcity of gold.

WALTER S. CHURCH.

The Metallurgy of Lead.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I have recently obtained, and very carefully studied, a copy of Hofman's "Metallurgy of Lead." I need hardly say that I am immensely pleased with the book. An experienced metallurgist very speedily recognizes whether a book or a paper on his specialty is written from the inside or from the outside of the subject, and this one is eminently a case of inside. The man who wrote it must have been a great deal among the work he describes. The book has got the "smell of the work" about it, and to read it is as good and as real as if one of your American superintendents of large experience had come over here and talked to me in my works of the way he does things in his. And I always reckon that is the best kind of education we can get in our work.

So, though I see Mr. Hofman is a professor, this is not what I call a "Professor's book." We make a professor, or a lecturer in metallurgy very easily here in some cases. The receipt is simple. Take a "demonstrator" of chemistry whose knowledge of works of any kind is just nil. Send him for a few weeks to an assay laboratory, and if your are very luxurious send him also for a few weeks to look at some native or foreign smelting works. Then set him to read up books on the metals and processes he is to lecture on, keep him a day or two in advance of his students, and there you are! This is how you do with a demonstrator if you have need to develop him quickly, so that he may take charge of a metallurgical department in your college. If in the course of nature he blossoms from a demonstrator into a professor of chemistry nothing more is necessary, as every professor of chemistry in some mysterious way knows "ex-officio" all about all metallurgical processes and most other things.

There are several points in American practice, as detailed in this book, which are interesting to me as varying more or less from what we do over here; and there is one little matter which is prominent in my mind just now because Mr. Hofman's statements have led me to try over again experiments which formerly gave me great disappointment. I am sorry to say that the disappointment is even greater this time. I allude to the substitution of other materials for bone-ash in silver refining. I had heard from private correspondents of the use of Portland cement, limestone, etc., and I had made trials of them. The cement I never should have expected to succeed, but I made several excellent tests from it and induced other people to do the same. And always with the same result: The material was eaten away so rapidly by the litharge that in a few hours the test was done for. This is what I should have foretold, seeing how comparatively easily Portland cement can be fused and how vastly this process must be assisted by the fluxing action of the litharge. Yet in American works this material is reported to give excellent results, which do not, so far as I can make out, depend upon water-cooling, but are obtained also in ordinary uncooled tests. Limestone mixed with clay in various proportions has not succeeded any better in my hands. And I have failed also with powdered magnesia, making tests of it with clay and using pearl-ash as in the making of ordinary bone-ash tests. The resistance to fluxing is good in the case of magnesia, but the test does not become mechanically strong enough; the particles detach themselves and allow the metal and litharge to eat away the sides and breast rapidly. In fact, I have failed completely so far in getting rid of bone-ash; and the quantity of silver refined yearly under my charge being so large that bone-ash figures for a good large sum, my success would have been of some pecuniary importance as well as professionally gratifying.

Will some kind "American cousin" among your correspondents tell me why I have failed?

LONDON, Eng., April 13th, 1893. BONE ASH.

Compound Locomotive Trial.—In September last the Richmond Locomotive Works, Richmond, Va., delivered to the Chesapeake & Ohio Railroad a number of 10-wheel engines, one of which was a compound engine. The latter has since been in regular service, running alternately with a simple engine. Both have boilers and running gear alike; they have six drivers 57 in. in diameter, and the boilers carry usually 170 lbs. pressure. The simple engine has cylinders 19 × 24 in.; the compound has a high-pressure cylinder 19 × 24 in., and low-pressure 29 × 24 in., with an intermediate receiver. Steam from the boiler can be admitted to the low-pressure cylinder in starting or at other times when desired, a reducing valve being provided which reduces the admission to 40% of the boiler pressure. The report made on the six months' test now shows that on a division with moderate grades and working freight trains of nearly uniform length the simple engine showed a consumption of 3·42 lbs. of coal per car mile, while the compound usde only 2·60 lbs. per car mile—a saving of 24%. Both engines were new, and the cost for repairs was very nearly the same for both.

VARIATIONS IN THE MILLING OF GOLD ORES.—V. BALLARAT, VICTORIA.

Written for the Engineering and Mining Journal by T. A. Rickard.

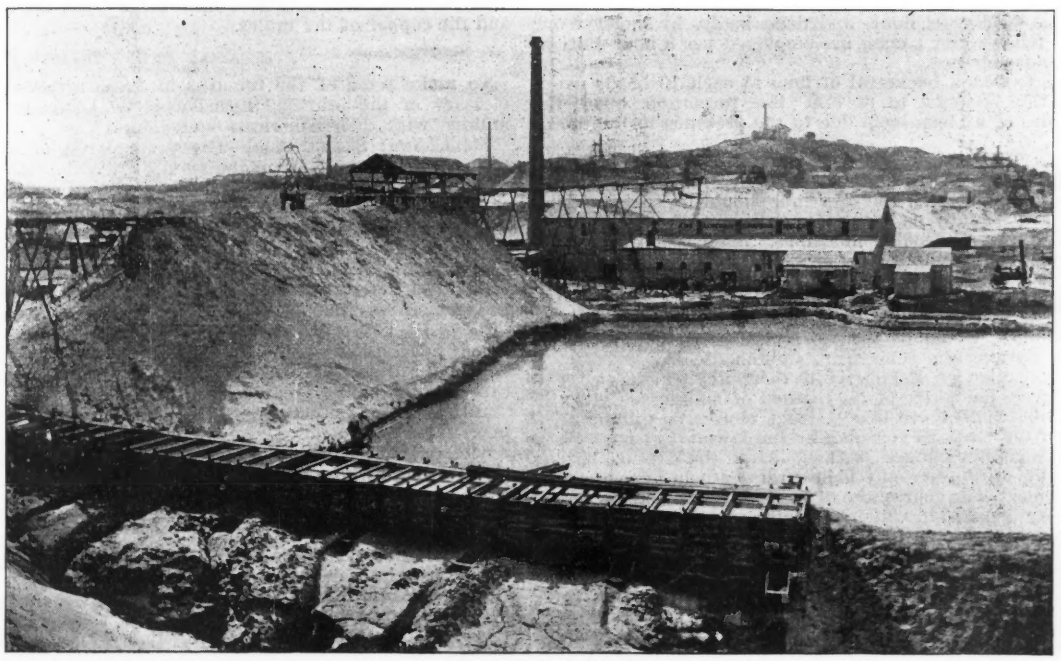
When gold was first found at Golden Point in August, 1851, the history of Ballarat began. It marked the commencement of a record more brilliant than that of any other of the great discoveries of that golden year. To-day Ballarat is the largest gold producing mining district in Victoria, for, unlike many of the rich diggings of the early days, it has not yet outlived its first reputation. The working of the rich alluvium commenced the development of the mineral resources of Victoria, and laid the basis of the commercial wealth of Melbourne. That alluvium, however, has been largely exhausted and to-day more than half the gold product of Ballarat is derived from the quartz lodes. It is a remarkable fact in the history of mining that mines which had produced largely from the alluvium became no less profitable as quartz mines, for in the bedrock of the deep leads were found the croppings of the quartz veins whose erosion in a bygone period had enriched those deep leads.*

For the year 1891 the output of the Ballarat district amounted to 202,740 oz. 1 dwt. 12 grs., of which 74,768 oz. 13 dwts. 3 grs. were alluvial and 127,971 oz. 8 dwt. 9 grs. came from the quartz. Dividends amounting to £222,839 15s. 0d. were paid during the twelve months. The average yield of the quartz was at the rate of 8 dwts 1 gr. per ton, while the pyrites (concentrates) contained 2 oz. 3 dwts. 2 grs. per ton. The price of the gold varied from £3 17s. 6d. to £4 3s. 0d. per ounce.† At the present time there are at work in the district 1,246 stampheads, 21 buddles, 4 stonebreakers, 28 concentrating tables, 2 Wheeler pans, 11 Berdans, 7 Chilian mills, and 6 Arastras. The average price paid for crushing quartz is 5 shillings per ton. A 5-head battery can be hired at the rate of 2½ shillings per hour.

The "Star of the East" at Sebastopol‡ is the most productive gold quartz mine in Victoria.§ The ore is treated at the two mills, one of which contains 60 stamps and the other 20. The larger plant is only two years old, while the smaller dates seven years back.

Going to the new mill first it is found that it consists of 60 stamps in two 30-head sections. Each stamp weighs 9 cwt. and drops 73 times per minute. The height of the drop varies from 8 to 8½ in. The center stamp of a battery of 5 heads drops ½-in. less than the other four. This is said to produce a better splash of the pulp against the grating or screen. The order of the drop is 5, 3, 4, 2, 1. The discs or tappets are of screw pattern. The depth of discharge or issue—the distance from the bottom of the grating to the top of the false bottom or die—is 2 in. when starting with new dies. Sand is packed tightly underneath. As the dies wear down a maximum depth of discharge of 4 in. is attained. When the gold in the ore is found to be unusually fine the dies are allowed to wear down still further so as to obtain as deep an issue as possible. The capacity of the mill is at the rate of 1,450 tons per fortnight of 12 working days. The grating or screen is of round punched Russia iron having 200 holes per square inch. Such gratings last for 12 days. On rare occasions, when ore containing gold in an unusually finely divided condition is encountered in the mine, gratings having 270 holes per square inch are substituted and their time of wear is only 3 to 5 days. As a rule, the gold is fairly course, though there is a marked difference in this respect between the product of the two lodes being worked in the mine. The percentage of concentrates obtained is 3½. They contain from 3 oz. 5 dwts. to 3 oz. 13 dwts. per ton and are sent for treatment to the chlorination works at Bendigo.‖

The bullion is very high grade, averaging 970 fine. The percentage of bullion obtained in retorting is found to vary with the ore broken from the two lodes. The amalgam from the No. 2 shaft retorts 45%; from the No. 1, 48%. The grade of the ore is in accordance with the retort yield, viz. 13 and 17 dwts. per ton respectively. This is in harmony with the usual experience that rich ore, because the gold is also usually more coarse, yields higher grade amalgam.



CRUSHING MILL AT BALLARAT, AUSTRALIA.

The comparative table which follows will give figures illustrating the chief features of the methods of work employed at four of the principal mills:

COMPARATIVE TABLE.

Name of the Mill.	Number of stamps.	Weight of each stamp.	No. of drops per min.	Height of drop.	Average depth of discharge.	Crushing capacity per stamp.	Crushing capacity of mill.	Description of grating.	Fineness of grating holes per square in.	Percentage of concentrates.	Contents of concentrates per ton.	Fineness of bullion.	Retort percentage.	Wear of gratings.	Consumption of mercury per ton of ore.	Consumption of water per stamp per minute.
		Lbs.		Inch.	Inch.	Tons.*	Tons.			%	Dwt.	Per 1,000	%	Days	Dwts.†	Gals.
Scar of the East.....	60	1,008	73	8¼	3	2	120	Round punched Russia iron.	200	3½	69	970	46	10	5·7	7½
Ditto old mill.....	20	784	75	8¼	3	1·5	30		150	3½	69	970	46	12	5·7	7½
Britannia United...	40	1,050	60	8	1½	2·1	84		120	1	27	978	50	14	2·6	5
New Normanby	20	784	60	7	4½	2	40		120	no	ne.	965	70	12	5·6	5
North Cornish.....	50	784	72	8	1½	1·8	90		160	2½	113	935	33	6	4·9	2½

* Long tons, 2,240 lbs.

† A flask of mercury in the colonies contains 75 lbs. avoirdupois.

The amount of water used is at the rate of 7½ gals. per stamp per minute, not including the boiler supply. In one month 16,588,800 gals. are consumed. The loss of mercury amounts to one bottle, or 75 lbs. avoirdupois. per month. This includes that consumed at the old mill and is at the rate of 5·7 dwts. Troy per ton of ore crushed. In this mill the gold saving is done in the mortar box, by copper plates outside, by wells or mercury traps, and indirectly by the blanket strakes and shaking tables. The mortar-box is made an amalgamator by the introduction every two hours of a teaspoonful (4 oz.) of mercury. There are no amalgamating plates inside. The amalgamating tables outside are covered with sheets of plain copper. They have a grade of ⅞-in. per ft. At their lower end there are two drop wells and one shallow well. These catch but very little gold, indeed when the copper plates above them are in good order they simply serve to arrest escaping mercury. Next come the blankets. The blanketings—the residues from the regular washing of the blankets—were formerly treated in an amalgamating barrel, but now they are stacked, lime is added and they are allowed to stand for two days, after which they are reintroduced into the battery in company with the usual ore supply. Below the blanket strakes are 8 ordinary shaking tables of inferior pattern. They do not discharge the concentrates automatically. The pulp which escapes from these passes over "ties" or straight sluices. Three Berdans are used for grinding the skimmings from the wells.

*At the Band and Albion 519,551 oz., wortb £2,078,235, were obtained from the alluvium up to 1879, when the value of the quartz reef in the bedrock was recognized. Quartz succeeded alluvial mining and gold of the value of £307,380 was obtained up to June, 1888. Total gold obtained, £2,685,615; dividends, £1,415,533.

†For these figures the writer is indebted to the Annual Report of the Secretary for Mines.

‡ Ballarat was born during the time of the Crimean War, and the names of former battlefields adorn every street corner.

§ During 1891 this mine produced 34,092 oz. gold and paid £79,200 in dividends The figures are taken from the Annual Report of the Secretary for Mines, Victoria

‖ Since the time when the writer was at Ballarat a new chlorination plant has been erected in the town itself.

The old mill contains 20 heads, weighing 7 cwt. each. It has a crushing capacity of 350 tons per fortnight of 12 working days. The arrangement of the different parts is very similar to that of the new mill. The copper amalgamating tables incline at ¾-in. per ft. They are preceded by two, and followed by three, wells. Then come two strips of blanket having a total length of 8 ft. and a gradient of 1¼ in. per ft. These are succeeded by four shaking tables, one to each battery. Two Berdans are used in the treatment of skimmings. A ball is first used and then a stationary drag, the amalgamation being carried on during both stages. It would be better to do the grinding of the material first with the ball and then add the mercury and do the amalgamation during the supplementary grinding done by the drag. The drag being stationary would not work upon the quicksilver; the former is placed at the side of the pan and the latter settles at the lower end. Less mercury would then be lost by flouring.

The Two Mills Compared.—The working of an old plant side by side with a new one treating the same ore naturally invites a comparison, which in this instance is prejudicial to the newer, larger and more costly mill. The millman acknowledges that the older mill is doing the better work. In this he is, I believe, correct. The main distinction between the two consists in the fact that in the 60-stamp mill the copper plates do that part of the gold-saving which in the 20-stamp mill is accomplished by wells. In both cases the bulk of the gold does not go further than the mortar-box itself, but is arrested by the action of gravity aided by the free mercury introduced by the feeder. Of that which escapes from the battery the plates get the larger portion in the new mill, but in the old one it is obtained by the two wells which precede the copper plates. Which is the better arrangement? The plates have a greater first cost and they require far more attention than the wells. It is only in comparatively exceptional cases, where the ore does not contain a large percentage of sulphurets and where the gold is comparatively "free" that wells can be satisfactorily used instead of plates, but where, as in this instance, they are found to accomplish the work of arresting the gold they are for the above stated reasons much to be preferred.

In both mills the feeding is done, and done badly, by hand. Four laborers (3 young fellows and 1 man) are employed per 8 hour shift in keeping the 60 heads supplied.

It is the custom to add a bucketful of lime to each 10 heads every two hours, since this is found to prevent the formation upon the amalgamating tables of a black scum due to the presence in the ore of base sulphurets.

By way of further criticism it is not too much to say that it is but a sorry result that with such a large and productive mine situated in a very enterprising mining district the new mill should be so far behind the ideal. There is absolutely no excuse for the want of a rockbreaker and the absence of proper feeding machines. The cost of such an installation cannot be pleaded by one of the wealthiest mining companies of Australia. Fault must also be found with the concentrating machinery, which is altogether inadequate to the requirements of the mill. An increase is wanted in the number of shaking tables, but in making any addition it would be well to secure percussion tables of proper design, discharging the concentrates automatically.

At the Britannia United on Bakery Hill‡ there are 60 stamps. The most important figures indicative of the method of milling are given in the comparative table. The ore is somewhat more free milling than that of the Star of the East, as is shown by the lower (1%) percentage of concentrates, the greater fineness of the gold and the increased retort yield. The bullion is of an unusually high caratage, being worth £4 3s. 0d. per oz. or 978 fine. The coarseness of the gold in the ore is shown by the retort percentage, which, while it sometimes reaches 65, averages 50. The gold saving is effected by methods similar to those described at the 60-stamp mill of the Star of the East company. One ounce of mercury is added to the mortar-box per ounce of gold in the ore. Immediately outside the battery there is a well 1½ in. deep and 3 in. wide, containing 10 lbs. of mercury. The copper plates have a grade of 1 in. per ft. The blanket strakes are 16 ft. long, in three longitudinal divisions each 17 in. wide. They have a slope of 1¼ in. per ft. Quicklime is added to the battery at the rate of 5 lbs. per each 5 heads per 24 hours. The water used in the batteries is warm and is made so by conducting the condenser water of the engine into the tank which supplies the mill.

Two points open to discussion are here suggested: viz., the use of warm water and the addition of lime. The object of heating the battery water in such a warm climate as that of Ballarat does not appear very evident. The use of condenser water in any mill is decidedly objectionable. To consider these two propositions, let us take first the effects of warm water upon amalgamation. At the alluvial mines of the mountains of the interior of Otago, New Zealand, the use of mercury,† the good friend of the miner all the world over, is hardly known, and the explanation given is that mercury will not act in the cold climate of that region. This is due to the use of hot water in cleaning up at both mines and mills. The idea is, of course, quite an erroneous one, though there is a substratum of truth in it from the fact that amalgamation is usually assisted by heat and retarded by cold, but within narrow limits only.† On the other hand, at Black Hawk, at over 8,000 ft. above sea level, in the bitter cold of the Colorado winters, the millmen will tell you that cold weather is better for amalgamation upon the plates than summer heat. Why? Because heat thins the amalgam and the vibration of the mill due to the falling stamps causes the globules of mercury to run off and down the surface of the amalgamating tables, while cold (which thickens the amalgam) tends to keep it in position. From one point of view hot water is to be recommended. Slimes which will float on cold water will sink in warm water, owing to the expansion of the air bubbles, which float the fine dust and are the raison d'etre of the slimes. On the whole, however, while amalgamation, and here the amalgamation of gold is the only question discussed, is assisted by heat, yet below the temperature of boiling water the effects of a small rise are so slight that it is doubtful if the use of warm water is to be advised in ordinary gold stamp-milling. It is certainly not to be recommended in summer at a locality having the climate of Ballarat, and therefore its use at the Britannia United is to be objected to.‖

It is safe to say that the employment of condenser water is altogether objectionable. On suggesting that such water would be sure to carry grease with it, the millman disagreed. At the New Chum Consolidated, at Bendigo, where the condenser water was not used in the mill, I examined the launder which carried it outside the building and found that the bottom and sides were coated with a slimy ooze which could not but be prejudicial to amalgamation. Grease of any kind is the millman's worst enemy, for it coats the globules of mercury and prevents their coalescing; it makes "flouring," which is the subdivision of mercury into small particles, permanent. Yet at this (Britannia United) mill, where condenser water is used, the loss of mercury per ton of ore crushed is only 2·7 dwts, unusually small, and less than at the neighboring Star of the East mill, where condenser water is not used. The explanation of these apparently contradictory facts is to be found in the addition of quicklime.

Five pounds of quicklime are added every 24 hours to each battery of five heads. As an alkali it is a solvent for grease, and though not intended as an antidote for the greasy matter contained in the condenser water there is no doubt that it acts as such.

At the Star of the East it is added to the blanketings previous to their reintroduction into the battery; it is also, as at the Britannia United, added directly with the ore fed into the battery. It is, indeed, in general use at the Ballarat mills with the purpose of keeping the amalgamating tables in good order. Lime as an alkali serves to neutralize the acidity of the battery water (produced by reactions upon the partially decomposed sulphurets when under the stamps), and in this way prevents the corrosive action of such water upon the iron of the gratings and the copper of the tables.

AUSTRALIAN MINING TERMS.

To make some of the remarks in these articles clearer, we give a glossary of the principal terms used in Australia in ordinary stamp milling, with their American equivalents:

Stem, Am.; Shank, Aus.—The vertical rod or shaft of iron which forms the upper portion of the stamp. It is the handle of the hammer.

Boss, Am.; Tophead, Aus.—A heavy cylindrical piece of iron inserted at the bottom of the stem and into which the shoe fits.

Shoe, Am.; Head, Aus.—The wearing part of the stamp which does the work of crushing. The face of the hammer.

Die, Am.; False bottom, Aus.—The anvil upon which the hammer falls. The iron on which the crushing is done. It is a removable part. Also called "stamper bed."

Cam, Am.; Wiper, Aus.—The curved lever which lifts the stamp and which hence is sometimes termed the "lifter."

Tappet, Am.; Disc, Aus.—The collar by whose projecting rim the cam lifts the stamp.

Mortar, Am.; Coffer, Aus.—The iron box inside which the crushing takes place. Also called "stamper box."

Screen, Am.; Grating, Aus.—The perforated metallic plate or wire cloth through whose openings the crushed ore is discharged.

(To be Continued.)

Occlusion of Hydrogen.—Recent experiments made by G. Neumann and F. Streintz on the occlusion of hydrogen by various metals give results at variance with those obtained by former experimentors, and some which are entirely new. Thus it was found that lead absorbed from 0·11 to 0·15 of its volume. Palladium black absorbed 502·35 volumes and platinum sponge 49·3 volumes. With gold two experiments gave 37·31 and 46·32 volumes, while silver absorbed none at all. The ratio for gold is greater than that formerly obtained by Graham, who likewise asserted that silver absorbed 0·211 of its volume. Iron in a finely divided state was found to occlude 19·17 times its volume, and copper 4·5 times; nickel being midway between the two, with 17·57 volumes. It appears that repetition of the experiment causes a decrease in the occlusive power of some of the metals. The experimenters explain this in the case of the noble metals by saying that an increase of density takes place, but they do not attempt to explain why the same takes place with iron and cobalt. A full account of these experiments is contained in the "Zeitschrift fur Analitisehe Chemie," vol. XXXII.

Gypsum in Florida.—In his report for 1892 State Chemist Norman Robinson says: "Not the least interesting discovery which the writer during the past year has been able to announce is the presence of gypsum in easily workable and probably very extensive beds in the counties of Sumter and Hernando. This gypsum, like the so-called soft phosphate, exists in a finely pulverulent state. In other words, nature, as in the case of the former product, has relieved us of the trouble and expense of grinding, and, when these beds are developed, as they undoubtedly will be, will furnish this material in a very cheap form. It is not unlikely that these beds represent the gypsum in the form in which it was originally deposited from the evaporation of the waters of inland seas during the very latest portion of the neocene period. Whether salt so frequently found as an accompaniment of such deposits will be found in lower strata underneath these gypsum beds is a matter which only subsequent investigation can determine."

(We understand that some of the Florida gypsums will not set or make "plaster of paris," though they are of value in agriculture.—Ed. E. & M. J.).

* Near the spot where was found on June 15, 1858, the Welcome nugget, which was sold by the lucky discoverers for £10,550; it weighed 2,159 oz.

† Discussed by the writer in "Alluvial Mining in Otago." Trans. American Institute of Mining Engineers, vol. xxi.

‡ The amalgamation of gold, not silver, in ordinary stamp milling, not pans, is here discussed.

‖ The time I speak of was summer; the temperature outside the mill must have been 75° in the shade. The water in the mill was giving off steam.

THE PARSONS TURBO-MOTOR AND DYNAMO.*

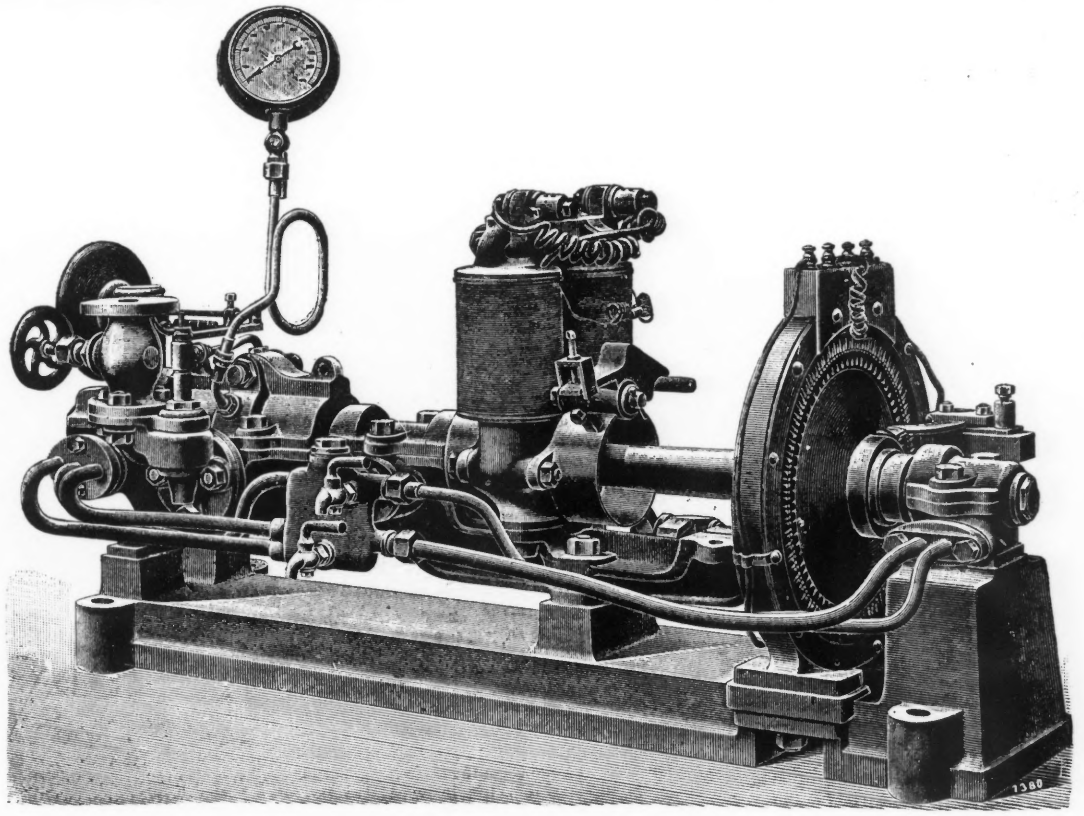
The steam turbine combined with two dynamos on one shaft, which is illustrated herewith, has been presented by Messrs. C. A. Parsons & Co., of Newcastle, to the Engineering Laboratory of Cambridge, England. Its chief point of interest is that one of the dynamos, designed by Professor Ewing, has a periodicity of 14,000 complete cycles per second at 12,000 revolutions per minute. The steam turbine has a normal speed of 12,000 revolutions, and is coupled directly to the dynamo shaft.

There are two distinct dynamos—one of the usual two-poled type, with a continuous current armature, for an output of 15 amperes at 100 volts, with 12,000 revolutions per minute. This armature may at will be converted into an alternator by slipping two contact rings on to the commutator, each ring being connected to diametrically opposite segments of the commutator and insulated from the others, the magnets being in this case separately excited. An output of 20 amperes at 40 volts, with a periodicity of 200 cycles per second, is obtained.

Professor Ewing's dynamo is complete in itself, and is bolted on to a prolongation of the bedplate. The field magnets, which revolve, consist of two mild steel discs laid together, but insulated from each other and forming one disc, which is of conical form, thickest near the axis, to give it strength to resist the centrifugal force due to its high speed of rotation. The edge of this disc is sawn into 140 projecting teeth, and the exciting coil consists of an insulated strip of copper wound zigzag around between the teeth and held in place by a ring of projecting lips formed by turning a low fillet on the side of each disc just at the circumference. The ends of the exciting coil are connected respectively to the two discs. An exciting current is supplied from an external source to two brushes rubbing on the discs. Each alternate tooth is thus magnetized north and south respectively. The armature is formed of about 60 thin charcoal iron disc rings about 0·01 in. thickness, built up into a cast iron frame. The rings are bored to 1-32 in. larger than the magnet discs, and sawn radially by 140 cuts ⅜ in. deep, thus forming 140 poles around which the armature wire is wound.

It will be seen that there are 70 complete cycles of current per revolution, and at 12,000 revolutions per minute, this gives 14,000 complete cycles per second.

The output is about 5 amperes at 100 volts. It is, we believe, intended to carry out a series of experiments on the physiological effects of alternating currents of high frequency, as well as other interesting investigations.



THE PARSONS TURBO-MOTOR AND DYNAMO.

An Indian Tunnel.—The East Indian Railway has its main terminus at Howrah, on the opposite side of the Hooghly River to Calcutta, and it is proposed to carry the line into the latter city by a tunnel under the river. Plans have been prepared for this work, which will be executed under the Greathead system, which has proved so successful in London and elsewhere. The excavation will be through fine sand, blue clay mixed with sand, and a stiff yellow clay. The estimated cost is $2,100,000. On the Calcutta side the approach is 1,750 ft. long, with a grade of 1·43%, while on the Howrah side the approach is 1,830 ft. long, with a grade of 1%. The length of the tunnel proper will be about 8,700 ft., with a shaft near each bank of the river.

* From London *Engineering*.

ABSTRACTS OF OFFICIAL REPORTS.

RIO TINTO COMPANY, LIMITED, SPAIN.

This company reports for the year ending December 31st, 1892, that the profit on sales of product and other items at the credit of revenue account, together with £66,162 brought down from the previous year's accounts, less all interest, taxes, expenses of administration, etc., amount to £420,775. During the year the cost of copper in the reserve heaps was reduced by 4s. 6d. per ton, representing a total of £21,541, and there was written off the extension and development account by a fixed charge on pyrites £15,137, making together £36,678, and leaving £384,097. Out of this amount the directors have provided for the mortgage redemption £75,900, and written off sundries, plant gone out of use, etc., £6,816; thus leaving a balance available for dividend of £301,381. The interim dividend of 7s. paid in November absorbed £113,750, and a final dividend of 7s. per share is now recommended to be paid, representing £113,750, which leaves a balance of £73,881 to be carried forward in revenue account. The dividends paid were the smallest since 1886.

The development work has been kept up and £12,466 were expended on this account. On the North Lode 557,573 cubic metres of overburden were removed, and arrangements have been made to take out 300,000 tons of pyrites in the current year. On the South Lode 35,595 cubic metres of overburden were taken out.

The production of copper at the mines was 20,017 tons, and there were 11,522 tons copper in the pyrites shipped, making a total of 31,539. Sales of copper were 29,449 tons. The statement of assets includes over 90,000 tons of copper estimated in the reserve heaps at the mines; this stands on the company's books at a cost of £5 0s. 6d. per ton.

The total output for the year amounted to 1,402,623 tons, containing an average of 2·819% of copper, as compared with 2·649% in 1891. Of this quantity, 406,912 tons were selected for shipment and 995,151 tons for local treatment. The deliveries invoiced to consumers in the United Kingdom, Germany, and the United States reached 435,758 tons, which is slightly in excess of the deliveries of 1891. The demands for 1893 between the United Kingdom and Germany represent from 60,000 tons to 80,000 tons in excess of the deliveries of 1892, and this increase has also been arranged for during the three following years.

TENNESSEE COAL, IRON AND RAILROAD COMPANY

During the fiscal year ending January 31st, 1893, this company acquired by purchase the whole of the lands, collieries, coke ovens, blast furnaces, railroads, dwelling houses and general equipment of the De Bardeleben Coal and Iron Company; the Cahaba Coal Mining Company, and the Excelsior Coal Company. For the De Bardeleben property there was paid $7,850,000 of the common capital stock of the Tennessee company, and the bonded debt of $3,000,000 and the floating debt were assumed. For the Cahaba property, which at the time of the purchase included the Excelsior, there was paid $3,000,000 of the common capital stock, and the $1,100,000 of bonds was assumed.

The result of the consolidation was to increase the number of blast furnaces from 10 to 17, the daily output of coal from 7,000 to 13,000 tons, and the area of lands held from 210,000 to 400,000 acres. The annual capacity of the blast furnaces is 633,000 tons, which makes the

company the largest single producer of pig coke and bituminous pig iron for the open market in the country. The annual capacity of the furnaces of the company is 36% of the entire production of coke and bituminous pig iron in all the Southern States.

The statement is made in the report that the company is not now working and has not worked over 5% of its property, and that its holdings represent more than 30% of all the available and accessible mineral lands of the States of Alabama and Tennessee, and more than 60% in value of all the coal and iron in both these States.

Stock Account.—The common capital stock was enlarged during 1892 from $9,000,000 to $20,000,000. No change has been made in the amount or status of the preferred stock, which remains at $1,000,000. The common stock is held by 280 persons, and the preferred stock by 133 persons.

Profit and Loss.—During the past fiscal year, which, however, included only 11 months' earnings of the De Bardeleben company and only 6 months' of the Cahaba, the gross profit was $923,550, which, after providing for coupon and other interest, bond premiums, and dividends on the preferred stock, left a balance of $290,069, equivalent to 1½% on the common stock. If the balances brought forward from the last fiscal years of the three companies purchased, $1,032,359, be added to this amount, the undivided surplus will stand at $1,322,429. This undivided surplus is, however, not now divisible, as it is largely represented by extensions, improvements and increase of working capital.

The assets of the company are $34,515,287, of which the land account represents $20,747,309; permanent investments, $8,600,708; temporary investments, $19,204; treasury bonds, $1,363,000; stock of the De Bardeleben company, $856,032; sundry debtors on open accounts, $1,425,572; inventory account, $1,220,235; cash items, $152,274; suspense accounts, $130,954. The liabilities are $34,515,287, represented as follows: Capital stock, $21,000,000; bonded debt, $9,198,424; bills payable, $1,546,481; accrued interest, $122,141; sundry creditors, $1,118,129; certificates of indebtedness, $194,748; unclaimed dividends, $405; bad debts reserve fund, $12,530.33; undivided balance (profit and loss), $1,322,429. The surplus of all free assets over floating debt on January 31st, 1892, was $574,316, and on January 31st, 1893, $1,316,805; an increase of $742,489. The bonded debt is now $10,116,000, no considerable portion of which is due before 1901, the greater part not falling due before 1917, when the Birmingham Division, $3,483,000 at 6%, becomes due.

As regards the permanent investments, under assets, it is to be remarked that the collieries, coke ovens and plant represent $2,513,615; the blast furnaces and plant, $3,963,954; the ore mines, rock quarries and plant, $130,992; railroads, locomotives, cars, etc., $1,201,336, and these items amount to $7,809,897 of the total of $8,600,708.

The retiring president, Hon. T. C. Platt, urges upon the company the necessity of engaging in the manufacture of steel, and it is understood that plans are now being made for the erection of a basic steel plant which shall take the metal direct from the furnaces to the hearths. The fact is that without some such absorption of a part of the output of pig iron this company will find itself embarrassed in the sale of its product. It makes too much crude metal, and must find means for converting a large part of it into steel.

THE BESSEMERIZING OF COPPER MATTE AND PRODUCTION OF PIG COPPER.*

By Charles Wade Stickney, A. B., M. E., Mem. Am. Inst. Mining Engineers.

(*Continued from page* 371.)

A man then shifts the belt, so that the converter turns on its trunnions through an angle of 90° until its mouth points toward and a little below the tap-hole of the re-melting furnace well. The launder is swung into place, and lowered by the chain tackle until its free end is thrust into the converter mouth. A helper to the lower cupola man holds an iron rod, 1 in. in diameter and 5 ft. long, at the tap-hole, while the cupola man drives it in with a sledge. This is sometimes quite a task, as the accumulation of chilled metal around the tap-hole sometimes requires the rod to be driven in two feet before the liquid metal is reached. When the rod slips in easily on reaching the liquid metal, the helper hooks a close fitting iron on the rod close to a knob at its outer end, and a reverse blow of the sledge jerks the rod out, the helper landing it out of the way by means of the hook iron. The molten matte then spurts out with great energy, under a pressure of about 6 lbs. to the square inch. It is allowed to run along the launder into the converter for about 10 minutes, that is, until about two tons have entered. As the converter begins to fill, a light blast is turned on to keep up the heat. At a signal to shut off, the cupola man places a sheet-iron shield over the launder so as to cover it for a distance of 4 or 5 ft. from the tap hole downward, in order to protect himself from the intense heat to which he is exposed while plugging the hole. The plugging is done in the usual way, by placing a pyramid of fire clay on a disk upon the end of a rod, and thrusting it into the tap hole. The launder is then swung out of the way, the air is turned on full blast, and the converter is brought upright with its mouth pointing into the opening in the dust gallery. A dense cloud of sulphurous acid and other gases pours out of the mouth of the converter with a noise like a heavy waterfall. The air blast enters under an initial pressure of 8 to 12 lbs. per square in., the higher pressure being more desirable. The blast is produced by a compound, direct-acting, pumping blower of the Corliss type, made at the Reliance Works, Milwaukee.

From this stage onward no fuel is used, and the heat is supplied by the sulphur in the matte, which is burned by the injected air. It sometimes happens, however, either from the initial temperature being too low, or from there being too small a charge, that the combustion of the sulphur fails to keep up the heat toward the end. In this case a stick of wood is thrown in.

* From the "Mineral Industry: Its Statistics, Technology and Trade for 1892." Copyrighted by the Scientific Publishing Company, New York.

The air enters the mass about 6 in. above the bottom of the lining. Its first action is to replace the sulphur in combination with iron by oxygen, and to oxidize this sulphur to sulphurous acid gas. This double reaction is shown by the equation: $2FeS+3O_2 = 2FeO+2SO_2$. The iron oxide is brought toward the sides by the action of the currents of air, and it here comes in contact with the incandescent quartz lining, and combines with it to form a bi-silicate of iron, which floats as a top layer. This action is shown in the equation: $FeO+SiO_2=FeSiO_3$. The composition of the slag thus formed varies considerably with different charges. It sometimes shows a few per cent. more SiO_2 than Fe, as indicated by the formula, but it usually contains rather more per cent. of iron than silica, thus showing that there is a small amount of the unisilicate formed. There are also small percentages of the silicates of lime and alumina.

This stage of the process is characterized by dense white clouds, tinged with rose and green. The rose tint first disappears and the white gradually diminishes, while the green becomes more constant. Finally, the close of this stage is indicated by both the white and green changing to a pale blue. When this change has become permanent it indicates that the iron is entirely combined with the silica.

The blast is now turned off, the slag pots are run under, and the converter turned over. While the slag is poured off in a thin stream, the skimmer tests the stream by rasping it with a long skimming rod, which causes the fluid to spatter in all directions. When the behavior of the fluid exhibits the characteristic jump of white metal, thus showing that some of this is escaping with the slag, the skimmer orders the converter up a few inches, and after lightly skimming the charge, he turns on the blast, and orders the converter straight up as before. Before the converter gets up to its old position, all the white metal obtained from the slag pots and the scraps of copper swept up from the floor are thrown into the charge. Each of the slag pots which has just been filled is found to contain when cold a button of white metal near the bottom. These buttons are easily separated from the slag by a blow of the sledge, and they are thrown into subsequent charges at the same stage of the process. The slag contains all round from three to five per cent. copper, and it is sent back to the blast furnace in company with the skimmings of the cupola well before described.

During all the period of blast, the wooden plugs in the wind-chest are extracted one after another, and the corresponding tuyere holes kept clear by rods, which are hammered into the converter. It is necessary to do this continuously on account of the rapidity with which noses of copper form over the tuyere holes, especially toward the close.

After the blast has again been turned on, and the second stage commenced, a rather scanty blue flame, sometimes mixed with white, come, away from the converter. The converter contains nothing now but white metal, as the iron, lime and alumina have been slagged off and the leads zinc, arsenic and antimony volatilized. The color of the flame changes gradually. First, the blue and white lessen and a rose color creeps in, until the former disappear and the latter alone remains. The rose then deepens to red and afterward to reddish brown; at the same time its size gradually contracts until at the close only a thin, sharp tongue of flame is to be seen.

The precise moment when the sulphur is all gone and nothing but metallic copper is left, is hard to prescribe, as it is entirely a matter of experience. The color of the the flame often varies in shade, and sometimes entirely disappears at the mouth. The changes from sulphide of copper, and again from copper to oxide, are so very slight in appearance that the whole charge may actually be oxidizing, and give no sign until the copper is too cold to pour. Such a mishap has sometimes occurred and has created an enormous amount of work: in fact, if such an event happens when the converter is pretty well worn, it would seem most profitable to cut the rivets and take it to pieces.

If, when the flame shows the process to be nearing its close, the sparks which are projected against the plate on the further side of the dust gallery are carefully watched, it will be seen that some of them stick to the plate, glow brightly, and instantly disappear, while others, of dull color, rebound from the plate like red hot shot. When those which stick and glow become few, and those which rebound become numerous, it is time to pour.

If it be an object to get a very high per cent. of copper, it is better to allow a small amount of oxide to form; but care must be taken that the charge remains hot enough to pour easily.

On turning down the converter the color of the interior will show to the experienced eye whether there is sufficient heat present in the mass. If the sulphur is not entirely gone the surface will be smooth, but if any oxide has formed it will be seen floating on top as a blebby mass. This cannot form so long as there is any sulphur remaining. In the pouring process the oxide is kept back by throwing a dam, composed of a few pieces of scrap copper from the floor, across the converter mouth. The copper flows out underneath this dam and the oxide is left inside the converter. This remaining oxide does no harm, and is not lost; for as soon as the new charge is put in it is reduced back by the sulphur in the matte.

A great deal of copper and oxide adheres to the lining, so that when a converter is to be relined, the best practice is to, as it were, wash it out by running into it as much matte as will fill a couple of slag pots, turn on the blast a few minutes and then turn out the whole charge into the pots. The clinging particles of copper and oxide are thus changed back into white metal, and as this readily pours, the old lining is left quite clean. This practice, however, is not followed when the converters are crowded with work and the blast furnaces are not.

When the lining itself has become so eaten that a clean sweep is to be made of it, the entire mass is taken out and distributed among some of the blast furnace charges. This is done because the copper, silver and gold work into it for four or five inches and would be otherwise lost.

When a converter is ready to pour, a series of removable molds arranged on a wheeled car are run under it, and four men, with long hooks, roll this truck forward or backward to catch the stream in the successive molds. As the copper shrinks very greatly in cooling, three or four molds are first filled, and then the frame is run back and the first filled up further, and so on, so that each pig may contain about 200 pounds of copper.

The molds are previously daubed with a clay mud to prevent the pigs from sticking to them. A charge produces about a ton of metal. The

time occupied varies very greatly with the grade of the matte, initial temperature and force of blast, and the average time, from filling to pouring, may be put at about two hours. With a low grade matte, after slag has been formed, the converter is sometimes again filled up with matte to avoid having at the close too small a mass of metal to retain the heat. The pigs rapidly become coated with oxide as they cool, which gives them the name of black copper. The fragments are pounded off from the edges, and they are ready for shipment.

One ton of 51% matte requires the following materials: Coke for remelting, 220 lbs.; coke for heating converter, 10 lbs.; silica, 666 lbs.; fire clay, 111 lbs.; lime, 5 lbs.

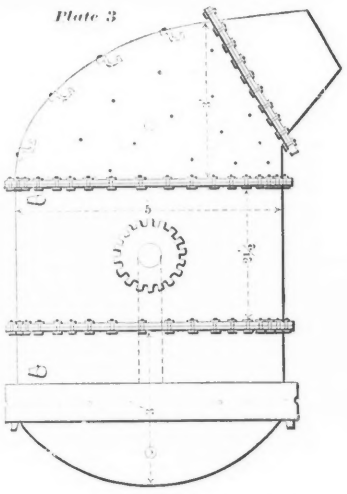
A plant of three converters and one remelting furnace is capable of treating continuously 25 tons of 51 per cent. matte per day, and, with good luck and good management, can be crowded up to 30 tons. There are two shifts of 12 hours each, and day and night shifts change men twice a month.

The labor required per shift is as follows: One foreman at $5, $5; two cupola men at $3.75, $7.50; one liner at $3.50, $3.50; one skimmer at $3.50, $3.50; 7 laborers at $3, $21; total, $40.50. This gives the cost per day of two shifts, $81. If six converters are run together with two remelting furnaces, the total cost of labor is somewhat diminished as follows: Two foremen at $5, $10; 6 cupola men at $3.75, $22.50; 3 liners at $3.50, $10.50; 4 skimmers at $3.50, $14; 28 laborers at $3, $84; cost per day, $141.

If the capacity of six converters be crowded up to 60 tons per day, the force must be increased for both shifts, thus: Two foremen at $5, $10; eight cupola men at $3.75, $30; four liners at $3.50, $14; four skimmers at $3.50, $14; 36 laborers at $3, $108; cost per day, $176.

The second case gives the lowest price for labor per ton, but is only possible where the two remelting furnaces are so situated as to allow of one cupola man above attending to both. Laborers act as helpers to all skilled workmen, and shift about as needed, except a few who are assigned to definite duties.

Plate 3



Improved Parrot Converter
¾" Cast Iron
Removable & Separable

The composition of the lining in the bottom and sides of the converter, and in the converter hood, is as follows: For converter bottom and sides, crushed quartz, 99 per cent. silica, coarse and fine, twenty parts by bulk; and best fire clay, three parts by bulk. For converter hood: Fine crushed quartz, 99 per cent. silica, six parts by bulk; best fire clay, one part. For the remelting furnace and well, and for the launder, the same as for the converter bottom and sides.

Cost of treatment per ton of matte at Butte: Labor, $2.93; fuel, .98; silica and fire clay, $1.84; blast, .90; total, $6.65. To this must be added interest on investment and on the expense account for 30 days, between shipment and marketing. At 10 per cent. per annum, this will amount to an additional 13 cents per ton. Repairs and renewal fund will add another 13 cents per ton, giving a total of $6.91 per ton of matte, or $13.55 per ton of copper, viz., about two-thirds of a cent per pound of copper produced. The price of fuel is based on coke laid down at $8.50 per ton.

The cupola shaft has been water jacketed; this is a very decided and obvious improvement, readily suggested by blast furnace practice. The metal well has also been water jacketed; this is not so evident an improvement, because the matte, when sometimes kept a long time in the well, owing to some delay in the converters, gets chilled to a great depth about the tap hole and bottom. The lining of the well, as before practiced, would seem to be the better plan.

Converters have been made of cast iron, ¾-in. thick, and in three sections, which are separable when bolts around the edges are removed. See Plate 3. These cast iron converters are removable from their trunnions and are handled by a car and crane. When the lining is to be repaired the converter is removed by running a car under it. The car is provided with four adjustable platform screws, which are screwed up until they impinge upon four projections cast upon the side of the converter. The trunnion screws are then loosened and removed, and the converter is run out on a track, where a steam crane picks it up and set, it on the floor. The three sections are then separated by unscrewing the bolts around the circumference, and the interior, thus exposed to the air, soon cools sufficiently for relining. Meanwhile, another extra converters which has been previously relined, is put up in the place of the one just removed. This arrangement requires a double set of converters, one being worked while the other is being cooled, relined and heated up again. The cooling is sometimes effected by a blast of cold air passed in through the trunnion, and the same blast heats it up again when a fire is kindled inside. By means of the steam crane the three parts are easily picked up and put together after relining. The arrangement for turning the converters consists of a rack and pinion wheel, the latter being attached to the trunnion, and the rack being moved by a piston in a water cylinder. The water pressure is furnished by a double plunger pump and a hydraulic accumulator.

(To be Continued.)

THE LAUSSEDAT PHOTOTHEODOLITE.

The accompanying illustrations show an instrument originally devised by Colonel Laussedat, director of the French Ecole Nationale, and brought into its present form by MM. Ducretet and Lejeune, of Paris. The inventor and makers have given it the name of the phototheodolite, which is descriptive of its uses. The applications of photography in surveying are not new, and their usefulness has been shown in this country as well as in France, notably by Lieutenant Reed, of the United States Army at West Point. The instrument, as described by "Le Genie Civil," is shown in Fig. 1; it consists of a photographic camera mounted on a tripod, the telescope and level being attached to the side of the case. The objective is fixed in a cone of aluminum, and can be moved vertically, the camera remaining always horizontal. The inclination of the line of sight can be determined with exactness, as will readily be seen. When desired the camera can be removed entirely, and the instrument then becomes an ordinary level, as shown in Fig. 2. This is convenient in many cases where it is not necessary to apply the photographic attachment.

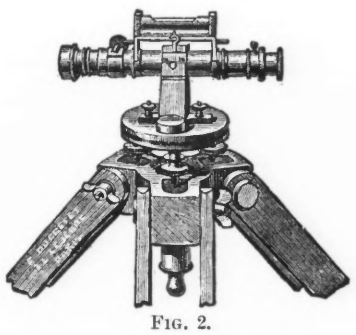


FIG. 2.

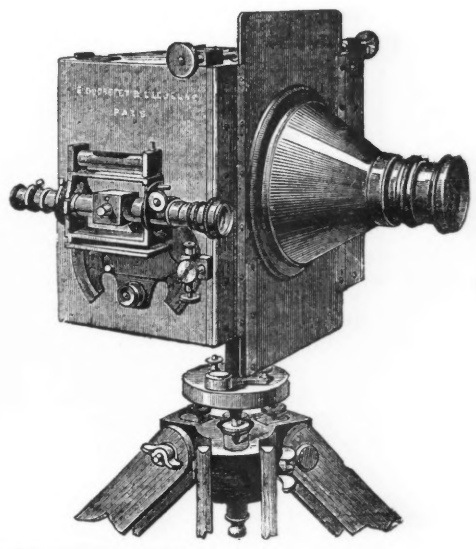


FIG. 1.

THE LAUSSEDAT PHOTOTHEODOLITE.

Some excellent work has been done in photographic surveying under the direction of Colonel Laussedat and his assistant, Commandant Javary, in France. The instrument has also been used in topographical work in Canada by Mr. Arthur and Mr. E. Deville.

Exports of Iron and Steel from Great Britain.—The total exports in March were 220,837 tons, as against 218,980 tons in March, 1892, and 256,439 tons in March, 1891. The exports during the first quarter of 1893 were 609,676 tons, valued at $24,594,423, as against 599,968 tons, valued at $25,713,861 in 1892, and 694,439 tons, valued at $31,481,427 in 1891.

Mineral Production of Nova Scotia in 1892.—According to the annual report of Dr. Gilpin, Deputy Commissioner of Mines, the mineral output of Nova Scotia during 1892 was as follows: Gold, 19,998 oz.; iron ore, 75,000 tons; manganese ore, 111 tons; coal raised, 1,942,780 tons; coke made, 55,000 tons; gypsum exported, 162,285 tons; copper ore, 26 tons. The coal trade returns show sales of 1,752,934 tons, against 1,849,945 tons in 1891. The falling off was due to decreased home consumption and lighter sales to Quebec and the United States. The gold output of 1892 shows a decrease when compared with 1891 of 3,393 oz. To quote the report: "The returns for the year 1892 show 32,552 tons of quartz were crushed, yielding 19,998 oz. of gold for 120,761 days' labor, as compared with 35,212 tons of quartz yielding 23,301 oz. of gold for 149,381 days' labor." Since the completion of the table, returns have been received from Waverly showing 1,051 tons of quartz crushed, and 332 oz. of gold for November and December, and returns from Truro mill, Caribou, showing 30 tons yielding 750 oz. for the month of December, bringing the actual total amount of gold mined in 1892 up to 21,080 oz. The Oldham district leads in the return of gold, the total being 3,093 oz. from 2,259 tons crushed, being an average yield of 1 oz. 7 dwt. 9 grs. per ton. The Malaga district comes second with a yield of 2,656 oz. from 2,720 tons quartz, and the Stormont district third, with a yield of 2,482 oz. from 3,652 tons quartz. The district showing the highest average yield per ton of quartz is the Uniacke, the average being 2 oz. 18 dwt. 12 grs., or a total of 2,300 oz. from 786 tons of quartz. There was a marked increase in the production of iron, but copper shows no improvement, gypsum continues much the same, manganese shows an increase, and a shipment of one ton of lead ore is noted.

MINERAL PRODUCTION IN THE UNITED KINGDOM IN 1892.

Written for the Engineering and Mining Journal by S. H. North.

The output of coal from the mines of the United Kingdom during 1892 shows a diminution in quantity. Such a movement has not occurred since the year 1886, when the output receded by nearly two million tons from that of the previous year. The fluctuations that appear in the production of coal are a fairly good criterion of the condition of business, for no industry can possibly show any marked development which is not observable in the rise of the quantity of fuel produced. In the case of the United Kingdom, it may sometimes happen that foreign demands have been large, while the home consumption has been at a low ebb. In 1892, however, the iron trade in most of the continental countries, which are the largest customers for coal, was as indifferent as in England; therefore, the decrease in the output indicates a lowering of demand from a vast number of works, more especially, too, when the period of excessively cold weather that prevailed in the winter seasons of 1892 is considered.

The total quantities for the principal districts in the United Kingdom for 1892 compared with 1891 were as under:

	1892.	1891.
Durham	23,831,000	29,807,000
South Wales	31,207,000	29,893,000
Yorksbire	23,190,000	22,794,000
Lancashire	22,356,000	22,722,000
Staffordshire	14,132,000	14,325,000
Derbyshire	11,141,000	11,039,000
Nottinghamshire	7,160,000	7,221,000
Northumberland	9,529,000	9,331,000
Other districts	11,931,000	12,818,000
Scotland	27,192,000	25,423,000
Ireland	112,000	106,900
Totals	181,787,000	185,479,000

The decrease is therefore 3,692,000 tons, a little less than 2%, the greatest backward movement that has occurred in the coal trade for at least the last 30 years. A considerable diminution was recorded between 1883 and 1884, the output in the latter year contrasting with former as 160 to 163. In the period of depressed trade about 1873 and 1874 the shrinkage was only to the extent of a little over 2,000,000 tons, although, of course, trade was not of such extensive proportions as it is now. Naturally the most conspicuous relaxation is visible in the district of Durham, where the great colliers' strike prevailed for three months—a period in which, at the rate of output for the year, some 5,500,000 tons might have been added to the total. The iron and steel trades have a great deal to answer for in regard to the decrease in coal, for, as we have already shown in the "Journal," there has been a falling off in the production of pig iron of 611,606 tons; in Bessemer steel of 141,195 tons; in open hearth steel of 95,708 tons, and in manufactured iron there was also a large decrease. The cotton industry, in which a lengthened strike has prevailed, has also affected the working of the coal mines.

The following table shows the number of mines that have been open during the year, the number of workers employed, and the number of accidents which have occurred in the pit:

	No. of mines.	No. of workers.	Total No. of accidents.
Durham (South)	228	65,249	44
S. Wales and Monmouth	366	117,713	22
Yorkshire	498	86,563	71
Lancashire	501	81,586	128
Staffordshire	534	41,859	65
Midland	315	62,475	59
Northumberland and North Durham	241	66,511	73
Other districts	246	52,498	15
Scotland	543	89,008	120
Ireland	21	838	1
Totals in 1892	3,403	664,300	814
" " 1891	3,439	648,450	911

In spite of the reduction in the output of coal therefore, the number of employees has been larger by some 16,000 than in the previous year. The average tonnage raised per man would thus seem to have been less than in 1891. A satisfactory feature about the figures given by the government inspectors is the decrease in the number of accidents that have occurred. This shows an improvement in the circumstances under which the hazardous labor is effected.

Ironstone.—The figures which follow only represent the quantities worked under the Coal Mines Regulation Act, and do not include iron ores raised under the Metalliferous Mines Act:

	1892, tons.	1891, tons
Cleveland	3,411,400	5,128,303
North Staffordshire	990,895	1,023,885
Scotland	872,435	748,336
Other districts	369,756	328,626
Totals	5,644,486	7,229,150

Cleveland has suffered from the stoppage of the blast furnaces there, through the disastrous coal strike, while it reacted upon other districts, in some as a depressing influence, in others, as Scotland, for instance, as a stimulant to the iron trade.

Other minerals have been produced in the following comparative proportions:

	1892. Tons.	1891. Tons.
Fireclay	2,212,233	2,394,065
Oil shale	2,085,662	2,352,471
Garrister, limestone, etc	225,556	238,780

This gives a total output of all minerals mentioned of 191,954,908 tons, against a total of 197,693,592 tons in 1891.

Deepest Coal Mines in Europe.—The deepest single shafts are those of Viviers, near Gilly, in Belgium, 3,379 ft., and of the Ashton Moss Colliery, England, 3,120 ft.

WASTE IN MINING AND PREPARING ANTHRACITE COAL.

It is understood that the report of the Commission on Anthracite Coal Waste is nearly ready for publication, and it will doubtless embody all that is now known on the subject. But in order to open the subject for discussion, we give at this time the conclusions in Mr. Thompson's preliminary report, so far as concerns certain mines on the Girard estate. The Hammond Colliery, leased to the Philadelphia & Reading Coal and Iron Company, was opened in 1863. Its total shipments to the close of 1892 were 4,458,148 tons. The probable total original contents of the area were 12,313,350 tons, and, if we subtract from this the shipments plus 9%, for average consumption at the collieries, or 401,233 tons since 1863, we have for the coal left in the ground 7,453,969 tons, or 60.6% of the original total. For the last three years the colliery consumption of coal has averaged 12.6% of the shipments at the Hammond, but an average of 9% since 1863 is thought to be fair for purposes of calculation.

Mr. Thompson makes the following general distribution of the coal lost and won at the Hammond, by percentage: Total shipped and consumed at mines, 38%; coal and coal dirt sent to culm banks, 11%; coal left in mine, 51%. Applying these figures, we have the following statement of the condition of affairs at the close of 1892 at the Hammond: Coal shipped and consumed at mines, 4,689,073 tons; coal and coal dirt in culm bank, 1,354,468; coal left in mine, 6,279,808; total, 12,323,349 tons. By this method of calculation, the amount of coal shipped and consumed in operating the mine is 170,308 tons less than the amount obtained in the former statement, while the amount left in the mine is 174,161 tons less.

Mr. Thompson analyzes the culm bank, by percentage, as follows: Dirt, 35%; slate, 23%; marketable coal, 42%. Applying these figures to the 1,354,468 tons in the culm banks, we find that they contain: Dirt, 474,063 tons; slate, 311,527 tons; marketable coal, 568,878 tons.

According to an estimate of Mr. Thompson, the total amount of culm produced at the Hammond up to August 1st, 1892, was 2,057,833 tons, or 46.73% of the shipments to that date. The marketable coal (42% of the culm) would then be 864,289 tons, instead of 568,878 tons. The true figure lies probably between these extremes, and we are inclined to accept Mr. Thompson's estimate of 720,242 tons, as the obtainable amount of coal in the culm banks.

It is not possible to say what proportion of this is chestnut; it may be anywhere from 10,000 to 20,000 tons, but it is at any rate certain that by far the greater proportion is of the smaller sizes. Mr. Thompson thinks that 20% of the total contents of the culm, say 140,000 tons, will not pass a ⅜ in. screen, and that 80%, say 560,000 tons, will not pass a 3-16-in. screen. Just how much of this culm coal can be profitably recovered is an open question. It depends not only on the relative amount present, but also, and particularly, upon the quality of it after it has been obtained. The coal in some anthracite culm banks is worth a good deal more than the same sizes from other banks, and the matter does not depend entirely upon the nature of the seam from which the coal was originally mined. Fires have now and then broken out in the banks and burned the larger sizes, and while the small sizes have not been actually on fire, they seem in many places to have lost their volatile matter, and to have been otherwise altered by the fires so as to have become less valuable for fuel. Of course, banks that have been on fire for years, smouldering away and gradually changing into heaps of ashes and clinkers, are of no present or prospective value, and we speak only of such as have at some time or other been on fire in isolated spots, large or small, and whose combustion has been checked. The small sizes of coal immediately surrounding such extinct fire-holes have suffered a deterioration of value, and, while still classed as pea and buckwheat and birdseye, are really a perplexing factor in the recovery problem. There are, however, many hundreds of thousands, or even millions, of tons of small coal in the culm banks of the Wyoming, Lehigh and Schuylkill regions that would be worth to-day very nearly as much as fresh pea and buckwheat, if some cheap and efficient system could be devised for handling the stuff that contains them.

The use of the small sizes of coal has been increasing for several years past, and this is notably the case with buckwheat. The smallest coal provided for in the leases of the Girard estate prior to 1869 was chestnut, passing a screen of 1-in. mesh. In 1869 pea coal was recognized, that is, such as would pass a screen of ⅝-in., and in 1878 buckwheat was added, being classed as coal that would pass a 3-16-in. screen.

The first separate shipment of pea coal from the Girard estate was from the Girardville (now Hammond) Colliery, in April, 1867, and the first separate shipment of buckwheat was from the Hammond in August, 1878. From the Girard estate there were shipped in 1881, 11·18% of pea, 1·95% of buckwheat; in 1886, 13·56% of pea, and 5·58% of buckwheat, and in 1891 11·91% of pea and 9·59% of buckwheat, so that the use of buckwheat has grown within 10 years to very respectable proportions.

But the recovery of these sizes from the culm banks has not yet assumed any great importance. Enough, however, has been done to prove the applicability of screening and washing, and if the tailings were returned to the mine to serve as filling for the old chambers, doubtless the culm banks would no longer lie idle. Screening will take out a large proportion of the sizes between chestnut and buckwheat, and if the coals passing the last screen were then washed for the birdseye, and such of the buckwheat as was still unseparated, the recovery of all the available coal would become possible. Instead of screening the culm for separating the various sizes, it could be passed over a 1-in. screen for removing the larger pieces of slate, etc., and then passed at once to the washer, the washed coal going to the bins, and the tailings to the mine. The use of such material for filling has already attained considerable dimensions, and promises to be still more widely extended. At the Plymouth Collieries of Haddock, Shook & Company, near Wilkes-Barre, the fine stuff has been used for packing the chambers for several years, with the best results. It enables the miner to recover nearly all

* Abstracted from report of Mr. Heber S. Thompson, Engineer of the Girard Estate Collieries, to the Philadelphia City Trusts.

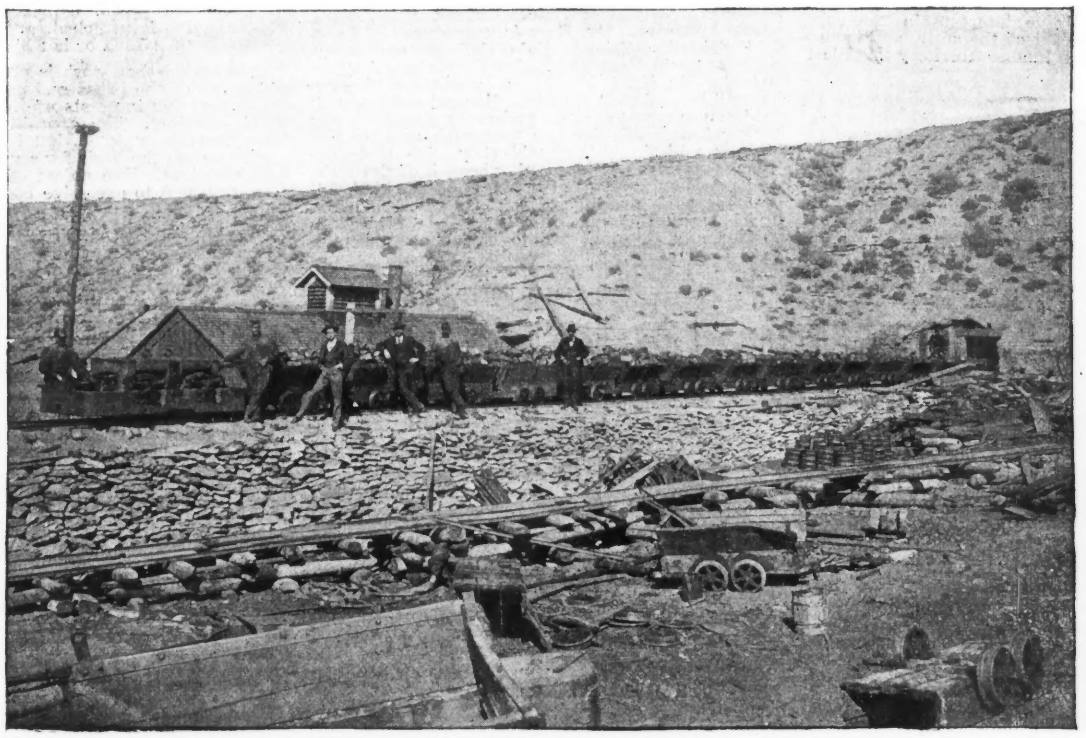
the coal left as pillars, assures a firm support for the roof and disposes of the grave question of storage of refuse. Many mining companies are coming to the limits of their dumping ground, and the purchase of more property, to be in turn covered with waste, is a serious matter, so that the working over of the culm banks offers a solution of some difficulties now in the way of operators.

ELECTRIC HAULAGE IN COAL MINES.

In the "Engineering and Mining Journal" for December 17th, 1892, an electric locomotive for mining purposes, designed and built by the General Electric Company, was described and illustrated. A motor of this kind, called the G. L. M. type by the company, has been for some time in use at the Rock Springs Coal Mine, in Wyoming, and has done excellent work there. It is of 60 H. P., and runs on a track of 30 in. gauge.

This plant was installed by the Mining Department of the Northwest General Electric Company. About a mile from the mouth of the mine, the power station, containing a dynamo of 80 H. P., driven by a steam engine, is located. Current from this is delivered at a pressure of 550 volts, which allows of a drop of about 10% between the power-house and the mine. The feed or supply wire is No. 000 hard drawn bare copper, making a complete metallic circuit. The trolley line is furnished with a circuit breaker about 30 ft. from the mine mouth, so that the current may be cut off from the mine when the locomotive is employed for switching purposes outside. The usual speed of the locomotive is about 8 miles an hour. The cars used are of the ordinary coal mine type, weighing each, when filled, about 3,000 lbs.; when empty about 1,000 lbs. The work done is illustrated by the fact that 30 cars were run from the loading point to the end of the track, a distance of about 6,000 ft., there dumped and returned to the mine in 20 minutes. On another occasion, the locomotive drew after it 30 loaded cars, and pushed ahead 16 others from end to end of the road without difficulty. The track is built of 35-lb. T. rail, and has several switches and spurs necessary to the rapid handling of the cars. As to the question of danger from the trolley wire, a recent letter from the expert giving an account of contact with the bare wire and the results says: "Several men have been shocked since our plant began operating, but the effect is only momentary, and they only laugh at it. The result has simply been to remove all fear they had of it. As I stated in my letter, this is a very dry mine, and so the only way one can get shocked is to stand on a rail and touch the wire. I have been shocked myself several times while handling the locomotive, through thoughtlessness. The other day a balky mule ran right into the wire with his head. He was knocked down. He got up and ran into it again three times, and was dropped in every instance. After that he simply turned around and walked off to his work. I ought to remark that the shock does not knock a man down or burn him. The only description I can give of its effect from personal experience is a tingling sensation, lasting, in the heaviest shock I received, not more than one or two minutes afterwards in the hand that made contact."

The illustration is from a photograph of the locomotive and train. There can be no doubt that in many cases the electric motor presents the best and most convenient method of using power for traction in a mine, and its use will continue to extend.



ELECTRIC MOTOR AND TRAIN AT ROCK SPRINGS COAL MINE, WYOMING.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

United States Circuit Court, District of Colorado.

Mining Claim—Mines and Mining—Adjoining Claims—Apex—Following the Vein.

In error. Action by John Turck vs. The Colorado Central Consolidated Mining Company, to recover possession of the "Aliunde Tunnel Lode No. 2" in the Argentine Mining District, Clear Creek County, Colo.—There was a verdict and judgment for plaintiff, and defendant sued out a writ of error. Judgment was affirmed; now petition for a rehearing.

1. In an action of ejectment to recover certain mining territory, as between the owners of adjoining claims, one of the issues made by the pleadings was to the point at which the vein passed out of the side line of one claim and into another, but at the trial this issue was not pressed, and the court, with the acquiesence of counsel, charged the jury that plaintiff claimed 600 ft. along the vein, and that the parties had apparently submitted that the case should be determined upon the point whether there was not one broad vein having an outcrop in both locations. Held, That the defendant was estopped from claiming on writ of error, that the recovery was for more than was warranted by the evidence relating to the exact point at which the vein crossed the boundary line between the two claims.

2. It appearing in such case that the vein in its dip passed through the side lines of plaintiff's claim into the defendant's claim, the fact that the jury failed to find the exact depth at which the vein crossed the line was no ground for reversal, since the question of ownership and possession was the only one in issue, depended entirely upon the location and width of the apex of the vein.

3. When the apex of a vein passes out of the side-line of a claim into an adjoining claim, the latter, though junior in date, gives to its owner the right to follow the vein in its dip underneath the senior claim.

Petition for rehearing denied—Thayer D. T. (Ninth Circuit)—Opinion. Feb. 6th, 1893.

PATENTS-PUBLISHED IN GREAT BRITAIN.

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

WEEK ENDING APRIL 12TH, 1893.

5,238 of 1892.	Apparatus for Distilling Tars, Shales, etc. J. A. Yeadon and William Adgie, Leeds.
6,341 of 1892.	Explosive Projectile Containing Sodium and Gunpowder or Dynamite, that Explodes on Contact with Water. O. M. Thowless, Newark, N. J., U. S. A.
6,732 of 1892.	Removing Scale from Tinplate Bars. R. and W. Phillips, Neath.
7,067 of 1892.	Heating and Melting Furnace. A. E., B. F. and H. M. Butler, Leeds.
7,441 of 1892.	Screening and Delivering Coal. H. Stevenson, Nottingham.
7,922 of 1892.	Rotary Calcining Furnaces. J. C. Fellner and C. Ziegler, Frankfort-on-Main.
7,983 of 1892.	Oil Water Gas. P. Dvorkovitz, London.
10,281 of 1892.	Process for Converting Proto-Salts into Per-Salts of Iron by Electrolysis. E. Hermite and A. Dubose, Paris.
10,649 of 1892.	Percussive Rock Drills. J. Murley, Davenport.
21,791 of 1892.	Improved Shape of Electrodes for Ozonizers. E. Andreoli, London.
24,061 of 1892.	Process for Electroplating Aluminum Articles. G. Wegner and P. Gührs, Berlin.
563 of 1893.	Improvements on the Mixer for Mixing the Iron from Several Blast Furnaces. J. M. While, Barrow-in-Furness.
2,399 of 1893.	Brass Founders' Melting Furnaces. J. A. and T. Fletcher, Ashton-under-Lyne.
2,716 of 1893.	Carburetted Water Gas. J. Askins, Lima, O., U. S. A.

PERSONALS.

Mr. W. D. Rees has been elected treasurer of the Lake Superior Iron Company.

Mr. Phillip Decker has resigned his position of superintendent to the Portland Smelting and Refining Company.

Mr. James A. Murray, of Butte, has offered 20 acres of land in East Butte as a site for the new Montana Mining School.

Mr. E. A. Thies, mining engineer of the Lustre Mining Company, of El Oro, Durango, Mex., has been visiting Deadwood, So. Dak., and prospecting the Barrel chlorination process as used at the Golden Reward Works.

At a meeting of the Board of Managers of the Lehigh Coal and Navigation Company, held in Philadelphia, Pa., April 24, Joseph S. Harris, president-elect of the Philadelphia & Reading Railroad and Coal and Iron companies, resigned the position of president and was elected manager of the company. Edward B. Leisenring resigned the position of manager and was elected president to succeed Mr. Harris. The changes will probably take effect on May 1. Mr. Leisenring is a son of the late Judge John Leisenring, of Mauch Chunk, Pa., who was connected with the Lehigh Navigation Company 50 years ago. The new president received a thorough technical education and from a very early period in his life he has been at the head of mining enterprises as superintendent, engineer and owner. He is thoroughly acquainted with the Lehigh coal region, and for a long time was superintendent of the Honey Brook mine at Audenreid. He had large interests in the coke region in the western part of the state, and is also interested in coal and lumber territory in West Virginia.

OBITUARY.

Floyd Peak, superintendent for the Knoxville Iron Company, at Coal Creek, Tenn., was shot and killed April 23d by a miner.

Isaac Ickelheimer, the well known banker, member of the firm of Heidelbach & Ickelheimer, large shippers of gold, died in New York Wednesday, April 26th.

Curtis G. Hussey died at Pittsburg, Pa., April 25th, in the 91st year of his age. He was a descendant of an old Massachusetts family and was born in York, Pa. He was a prominent copper manufacturer and built the first copper mill in Pittsburg. In 1843 he sent John Hays, of Pittsburg, to prospect and explore the Lake Superior region. During this trip he purchased for Dr. Hussey a one-sixth interest in the first three permits for mining in that region ever granted by the United States, and which produced enormously. He formed what was known as the Boston Mining Company. Dr. Hussey also developed and perfected the direct process of making steel.

Edwin Young, general attorney of the Delaware & Hudson Canal Company, died at Albany, N. Y., April 21st, aged 37 years. He was born at Honesdale, Pa., and was the son of Coe F. Young, who, with the late Thomas Dickson, was for many years one of the controlling minds in the management of the Delaware & Hudson Canal Company. He became the attorney of the Delaware & Hudson Canal Company in 1880, and from that time until his death continued to hold that position. His knowledge of railroad law was exhaustive. In addition to his position as general attorney of the Delaware & Hudson Canal Company, Mr. Young was at the time of his death president of the Ulster & Delaware Railroad Company, and of the Rondout National Bank, and a director in numerous industrial corporations.

SOCIETIES.

Central Railway Club.—The regular meeting in Buffalo, April 26th, was devoted to a discussion of the rules for the repairs of cars interchanged in traffic.

New York Academy of Sciences.—At the regular meeting of April 24th, a paper on a "Study of the New York Obelisk as a Decayed Boulder," by Alexis A. Julien, was read and discussed.

Boston Society of Civil Engineers.—The regular monthly meeting of the Society was held at Wesleyan Hall, Boston, April 19th. Mr. George S. Morison, of Chicago, gave the address of the evening on "Bridging Western Rivers." Mr. Morison described some of the difficulties experienced in securing proper foundations for bridges in the Ohio, Missouri and Mississippi rivers, and spoke of the peculiar characteristics of each of these rivers. He gave quite full details of one of the latest bridges built by him, that across the Mississippi River at Memphis, and had thrown on the screen a large number of lantern views illustrating his address.

WORLD'S FAIR NOTES.

The mineral exhibit of Iowa will have a complete collection of samples of the minerals of the State, including coal, clay, lead ores, etc. There will also be a set of drawings showing the operations of a coal mine and specimens of mining appliances used. Iowa is not generally considered a mining State, but has nevertheless large interests in coal mines and has also valuable deposits of clay of various kinds.

One of the most interesting exhibits in the Department of Mines and Mining will be the Analytical Laboratory in the southeast corner of the gallery in the Mining Building. The determination of ores of commerce, the composition of alloys and metals and complete analysis of all commercial products will form the exhibit, which is to continue throughout the entire length of the Fair. The latest volumetric and gravimetric systems of analysis and also fire assaying will be employed. The object of the laboratory will be a practical exhibit of the analytical methods used in inorganic chemistry. Work will be done for the entire Fair; and should not enough material be had from exhibitors, work will be taken in from the outside. All experiments will be made as interesting as possible, and the determination of rarer metals will receive a goodly portion of the chemists' time. Richards & Co., Limited, of New York and Chicago, will supply chemicals, glassware and platinum goods necessary for the work. William Hoskins will supply hydrocarbon blowpipe furnaces for assaying, using gasoline or fuel. Sergent & Co., of Chicago, will also supply apparatus necessary for analysis. The title of Chemist and Assayer to the Fair belongs to Mr. J. S. Cory, a prominent chemist of Chicago, the position being purely honorory. Mr. Cory is a graduate of Sheffield Scientific School, Yale College, and spent three years in Germany under Fresenius of Wiesbaden. Mr. Emil Furste, a graduate of Berlin, will be assistant chemist. Several colleges will send young men to act as assistants, arrangements having been made for two men each month. Exhibitors will do well should they give their patronage to this most interesting branch of the Fair. As perfect an analysis of products of any kind will be made as is possible. Mr. Cory, whose office is in the Unity Building, Chicago, will be pleased to answer any question put to him concerning the Fair Laboratory.

INDUSTRIAL NOTES

The Maryland Coal Company has removed its New York office from No. 35 to No. 1 Broadway.

Henry Aiken, Pittsburg, Pa., has furnished two ingot extractors to the Illinois Steel Company's Works at Joliet.

The West Superior Iron and Steel Company is making arrangements to build a blast furnace in West Superior, Wis.

The Oil Well Supply Company, Pittsburg, Pa., is making additions to its works which will considerably increase their capacity.

The Richmond Locomotive and Machine Company, Richmond, Va., is building 12 heavy passenger engines for the Seaboard Air Line.

At the rolling mill of the Sharon Iron Company, Sharon, Pa., recently a bar of ¾-in. round iron was rolled 310 ft. in length. It was done to show how long a bar could be made.

The Bessemer steel works of the Colorado Fuel Company, in Pueblo, Colo., are at work on an order for 3,000 tons of 66-lb. rails for the Atchison, Topeka & Santa Fe Railroad.

The Milholland Tube Company has been organized at Reading, Pa., with a capital of $20,000. The directors are Henry Milholland, Richard T. Leaf, Morton L. McIlvain, Brayton McKnight and J. Heister McKnight.

The Overland Machinery Company has been organized as a successor to the Hendey & Meyer Engineering Company. The works in Denver, Colo., are to be enlarged, and the facilities for turning out mining and similar machinery increased.

Mr. John Acton, manufacturer of valves and of the improved Bogardus mill, has removed from his former shop in New York to new quarters in Washington street, Brooklyn, where there are more room and greater facilities for an increasing business.

The Niagara Car Wheel Works, Buffalo, N. Y., will commence operations early in May, with improved machinery and modern appliances. The plant is nearly completed for the work of melting and casting car wheels, and will be the largest factory of its kind in the country.

The new machine shop for the Eastern Forge Company, of Portland, Me., will be designed and built by the Berlin Iron Bridge Company, of East Berlin, Conn. The building will be 57 ft. in width and 150 ft. in length, and will be entirely of brick and iron, with all modern improvements.

Witherbee, Sherman & Co., Port Henry, N. Y., in their yearly circular offer 75,000 tons of selected "Old Bed 21" lump ore for puddling at $3.50 per ton, with 40 cents discount for cash, making $3.10 net cash. Of furnace ore they offer 100,000 tons at $2.25, with 25 cents off for cash.

The Carbon Steel Company, Pittsburg, has let contracts to the Pittsburg Iron and Steel Engineering Company for two new 30-ton open-hearth furnaces, two electric traveling cranes and other additions to the plant. When these are completed the company will be able to turn out 350 tons of steel a day.

Frank C. Roberts & Co., Philadelphia, are engaged in the construction of the following plants: Montgomery Iron Company, Port Kennedy, Pa., 20 × 80 blast furnace; Cleveland-Cliffs Iron Company, Michigan, 14 × 70 blast furnace; Antrim Iron Company, Mancelona, Mich., 12 × 60 blast furnace.

Mr. George Westinghouse, Jr., has applied to the United States Circuit Court, New York City, for an injunction against the General Electric Company to prevent it from using electric converters, which he claims to have invented and patented. He also asks for an accounting of the profits made by the General Electric Company during the time it has used these patents.

Work on the new Bessemer plant now being built by the National Tube Works Company at McKeesport, Pa., is being pushed and the concern expects to commence the manufacture of Bessemer steel about September 1st next. The new plant will have a capacity of 800 tons per day, and is being erected by the Pittsburg Iron and Steel Engineering Company, of Pittsburg.

A large pair of shears has just been completed at Hussey's mill, Pittsburg. The bed-plate on which the shears is screwed down weighs over 40,000lbs., and the shears proper weigh considerably over 40,000 lbs. and are anchored to the bed plate by ten 1¾-in. bolts. A 12×14-in. upright steam engine is attached, and the shears will cut cold billets 4×5 in., or hot billets 6×10 in.

It is stated that work is progressing on the consolidation of the brass and copper rolling mill and manufacturing interests of the Naugatuck Valley, in Connecticut. The appraisal of the plants has been nearly completed, but it will take at least a month before the basis for a general agreement can be arrived at. The object of the consolidation is to put an end to excessive competition and cutting of prices.

The United States Circuit Court, in St. Louis, has refused to grant the Edison Electric Light Company an injunction to restrain the Columbia Incandescent Lamp Company. In this case the court differs from others which have passed on the question and holds the Edison patent invalid, owing to the prior invention of Goebel. There are now several conflicting decisions on that point, and the case must wait the decision of the Supreme Court.

The Westinghouse Electric and Manufacturing Company has received a contract from the Philadelphia Traction Company for 600 electric railroad motors and 8,500 H. P., D. C. generators. It also has the contract to supply all the electrical apparatus to be used on the line in that city. It is claimed this is the largest contract that has ever been let to any electric company for street railroad apparatus.

The Schultz Bridge and Iron Company has closed contract with the Akron (O.) Steam Forge and Iron Company for new forge and machinery buildings, for which about 270 tons of material will be required. The location has not yet been decided on. It has also contracted for an extension of the cast house and of the boiler rooms for the Rosena Furnace Company, of New Castle. It has just completed the large building for the Macbeth Glass Company, Ellwood, Ind., the plant covering two acres.

After several years of contention and interference before the Patent Office, two patents have been granted to Chas. J. Van Depoele, covering the essential features of the trolley. The patent is assigned to the Thomson-Houston Electric Company. In detail, the claims allowed cover, first, the underneath contact made either by a rolling wheel or a sliding spoon contact piece; secondly, the converse of these two cases; and, thirdly, the reversibility of the trolley pole on top of the car, enabling the contact to be made on either side of the trolley, as the case may be. The possession of these patents practically means the entire control of the overhead system throughout the United States. The acknowledgment of the claims under this patent made by the Patent Office is a victory for the General Electric Company, which will most likely be followed by important results to the street railroad interest, and may result in a long litigation.

MACHINERY AND SUPPLIES WANTED.

GENERAL MINING NEWS.

ALABAMA.

Cleburne County.

Crown Point Gold Mining Company.—The mill at this mine, near Micaville, is running steadily, and the ore recently mined has given very good returns.

Franklin County.

Lady Ensley Coal and Iron Company.—This company went into the hands of a receiver April 19th, for the purpose of protecting unsecured creditors. Maj. W. K. Saulberry, of Birmingham, was appointed receiver. This is one of the largest mining and manufacturing corporations in the South, and the property of the company consists of coal mines at Horse Creek, coke ovens at Jasper, the Hattie Ensley furnace and one-third interest in the Lady Ensley furnace at Sheffield and ore mines in Franklin County. The receivership will not affect the operations of the mines and furnaces. Everything will continue practically under the same management.

ARKANSAS.

Johnson County.

Eureka.—The miners at this coal mine are on strike. A pit boss was assassinated by them this week.

CALIFORNIA.

Butte County.

Mascot.—According to the Oroville "Register," the owners of this mine in Oregon Gulch lately ran into a chimney where ore was very rich. A mill is to be erected, and the contract calls for completing this in 35 days. The mill will be operated by water-power from the Hendricks ditch, and there will be an abundance of power, as there is a fall of over 200 ft. The mill will be built on a level with the lower tunnel, so that the rock can be handled rapidly and cheaply. This mine, under the name of the Armstrong, was worked many years ago, and it is said 1,200 tons of the ore paid $85 a ton.

Calaveras County.

Blazing Star.—This mine has started up with a crew of about 18 men, says the Mokelumne Hill "Chronicle."

Humboldt County.

(From our Special Correspondent.)

Preston Mine, Arcata.—This iron mine, after having been prospected thoroughly, is about to be worked extensively. A ledge 15 ft. wide crops out on the surface for a distance of one mile. The ore is hematite and assays 70% iron. A furnace is being erected and a large staff of men are to be put to work. The iron ore is practically unlimited and as the property is situated on James Creek, on the north side of Humboldt Bay, it is conveniently situated for shipping purposes.

Kern County.

The mining interests in Agua Caliente are beginning to revive. Los Angeles capitalists are reported to be looking over the locations owned by Anda Sauser. Ore of good quality is taken from his claims.

Mono County.

(From our Special Correspondent.)

Bulwer Consolidated Mining Company, Bodie.—Owing to bad roads shipments to the mill have been limited. During the week there were extracted 104 cars of ore, the average battery samples being $32.20; tailings, $8.12.

Nevada County.

(From our Special Correspondent.)

Homer Gold Mining Company, Grass Valley.—This property is to be opened up again and work carried on systematically, in contrast to the course adopted for some time past. At a meeting held this week the following officers were elected: W. J. Smith, president; C. Groesinger, vice-president; and C. Stepp, A. Gotz and J. Fischer, directors. C. J. Heggerty was elected secretary.

San Bernardino County.

(From our Special Correspondent.)

Vanderbilt Camp.—Inasmuch as the Mackay-Flood people have become interested in several properties in this section a great deal more attention has been attracted to the camp than the work up to date has warranted. A great drawback is the lack of a plentiful water supply. There are no running streams in the neighborhood, and there miner's inches of water are brought to the Gold Bar from a spring four miles distant. At a depth ranging from 20 to 40 ft. water is, however, generally found, but in varying and unsatisfactory quantities. An important item of information was received from the Gold Bar mine this week, to the effect that the shaft that had been sunk to a depth of 200 ft. had entered an altogether different and apparently barren formation. The prospects, however, are said to be good in the portion of the mine opened out.

The Bronze mine, which is owned by a Los Angeles man named Murphy, has had a shaft sunk upon it to a depth of 90 ft., passing through a similar formation as in the Gold Bar, of which it is the easterly extension. The owner proposes to incorporate and then list the stock in the San Francisco exchanges.

San Diego County.

(From our Special Correspondent.)

Helvetia Mining Company, Julian.—A decree of foreclosure of a mechanic's lien has been granted at San Diego. The judgment amounts to nearly $12,000, and Judge Pierce ordered the mine and mill site, comprising about 11 acres, and all fixtures and appurtenances to be sold.

Siskiyou County.

The recent rainstorms have started all the hydraulic claims in full blast in Siskiyou County, and an additional quantity of snow has also been added to the regular water supply on the mountain summits.

Sonoma County.

Great Eastern Quicksilver Mining Company.—This company, at Guerneville, has leased the Jackson mine and is working with a full complement of men.

Trinity County.

Ward Placers.—It is reported that Mr. L. L. Bailey, of the firm of Gilder, Bailey & Co., Denver, has bought the Ward gold placer property on Oregon Mountain, four miles west of Weaverville, for $250,000. Mr. Fred Beaudry, formerly superintendent of the Little Chief at Leadville, is associated with the firm, and will have charge of the development work. The property consists of between 400 and 500 acres of gravel on Oregon Mountain. It was originally the bed of an ancient river, and over the bed-rock is piled gravel from 125 to 300 ft. in depth. The firm's expert has estimated that this will all average 11c. for each cubic yard, and the firm will at once begin the construction of 60 miles of ditches, and after they are completed will employ four monitors and a steady force of 50 men.

(From our Special Correspondent.)

Trinity Mine, Weaverville.—This mine, one of the richest of the placer mines of California, has been sold this week by P. M. Paulsen and O. M. Loveridge to a syndicate of Denver capitalists headed by Bailey, Gilder & Co., the Denver bankers. The purchase price was $250,000. The Trinity mine is a combination of the Ward and Loveridge mines, and has been owned by Messrs. Paulsen and Loveridge since 1874. During the intervening time, under unfavorable conditions, there has been taken out $200,000 in gold. The lowest amount taken out in one day was $5,000 and the highest $25,000. The lack of water has, however, handicaped operations. At present water is stored in two reservoirs, but by this means a sufficient volume of water cannot be secured on a high enough pressure. The new owners will carry water through ditches from Stuart's Fork, 40 miles distant. The mining property embraces 400 acres.

COLORADO.

Clear Creek County.

According to the Idaho Springs "News," upper Clear Creek is the scene of considerable activity in mining this spring. A number of the old time producers are worked profitably. More than a dozen set of lessees are taking out good ore on the Mendota. Mr. Old, the owner of this mine, will put in a large electric plant this summer at the mouth of the Victoria tunnel for the purpose of sinking the main shaft and driving the tunnel as well as lighting the workings with electricity.

Hamlin Mining Company.—This company has been organized to operate at the head of Hamlin Gulch, with a capital of $750,000. C. W. Fonda is manager.

Fortunatus Mining Company.—This company made a shipment of ore on April 10 which ran 14.25 oz. in gold and 121 oz. silver, says the Idaho Springs "News." The March output of the West Santa Fe mine, the property of this company, was 50 tons, averaging 2.50 oz. gold and 30 oz. silver.

Dolores County.

Cowdry.—According to the Rico "News," a strike has been made on this property, located on Expectation Mountain on the same ore measure as the Iron Clad, Argonaut, and other producers. The property is owned by F. A. W. Day et al., and is being worked under a lease by S. C. Kankelborg and others. Considerable work has been done at different times, but only with the present lessees has it been done in a systematic manner. The main level is now in a distance of 400 ft., the last 20 ft. being in ore which runs well in silver and lead. A drift is now being driven each way from the tunnel and the main tunnel being driven ahead, and all are in good ore. The ore in the east drift is said to be 5 ft. wide and 6 ft. high. The ore body pitches at an angle of 20° to 30°, and has the appearance of a flat vein. The hanging wall is a black lime shale and the foot wall is porphyry. Two tons per day of ore have now been taken out.

Enterprise Mining Company.—This company, says the Rico "News," has leased the Adams concentrator, near the Grand View Smelter, and will start at once putting it in repair. There is a large amount of ore produced in the property of this company that pays well to concentrate. While the company intends in the future to put up a concentrating plant of its own, the leasing of the Adams plant was secured in order to make the necessary tests to determine the best character of mill to be erected. The ore can be transported to the mill at a small cost, as the track of the Rio Grande Southern connects the mine and the mill.

El Paso County.

Gladstone Mining Company.—The annual meeting of this company was held in Colorado Springs last week, and the following officers elected for the ensuing year: Seth Baker, president and treasurer; N. B. Pinsker, vice-president; R. H. Graham, secretary; F. C. Manning and L. Shrite, executive committee. The treasurer's report showed that $6,000 had been realized from the sale of stock and that $5,700 had been expended for tools and machinery. The directors elected S. N. McHenry as superintendent. The company has a force of men at work on the Hard Times lode on Gold Hill, near the Dearborn.

Hinsdale County.

Bushnell et al. versus Crook Mining and Smelting Company.—The United States Supreme Court decided on the 17th inst. the case of Bushnell and others against the Crook Mining and Smelting Company, being an action of ejectment brought in Hinsdale County, for the purpose of determining title to the portion of a mining claim on Ute Mountain. The controversy was as to the direction which the lode of the Bushnell took after it met with an obstruction in the vein. The Court found that the vein ran off to the eastward and did not include the surface lands claimed by the Crook company. The decision dismisses Bushnell's appeal.

Lake County.

Adams Consolidated Mining Company.—The Adams is said to be shipping 10 tons of ore per day. This ore all comes from the old workings in the upper levels. No new levels have opened out yet, as the ore reserves in sight are sufficient to keep the hoisting plant busy for several months yet.

Emmons Silver Lead Mining Company.—This company owns 200 acres of mining lands divided into 34 claims and a large concentrating plant. It has erected a tramway from the top of Peerless Mountain to the bottom. The main shaft is now down 170 ft. At the 100-ft. level ore was struck that averaged 25% silver and 66% lead. Company now claim that there is in actual sight $100,000 worth of ore. Work is suspended at present, but will resume actively in a short time. The company's main office is at Chicago.

Maid of Erin.—A promising vein of copper ore has been struck in the bottom of the shaft.

Mike and Starr.—Shipments of iron sulphides from this property amount to about 30 tons daily. They net a small profit.

Rusk-Ivanhoe.—An explosion occurred at this mine April 18th inst., in which four men were killed.

Pitkin County.

Smuggler Mining Company.—An important strike was made last week at this property in the 700-ft. level, where a 6-ft. body of ore running high in silver, was encountered. The property adjoins the Mollie Gibson.

Leadville.

(From our Special Correspondent.)

The London mill is about ready to start up; it has a capacity of 50 tons daily.

The Hard to Beat mine is shipping 10 cars of gold ore monthly averaging from $1,000 to $1,500 to the car. On the Baltic, which has a continuation of the Hard to Beat vein, lessees are taking out mineral and over $25,000 in royalties has already been paid.

The Midnight property, located on Little Ellen hill, is taking out about 100 tons daily, but arrangements are about complete for increasing this amount. The shaft is also being sunk deeper to get better connections with the ore bodies.

La Plata.—On the seven leases of this property considerable work is being carried forward and an increase in shipments is promised for April. Considerable new prospecting and new drifting has been done of late, and the ore bodies exposed can hereafter be worked more economically.

Lecompton.—Here preparations are being made to ship. The ore comes from a body of mineral met with a short time ago, showing 3 ft. in width, and as far as developed running 95 oz. silver and 20% lead.

Lime King.—For over 10 months but little has been heard of this property, as the owners have been doing nothing but sinking through the porphyry and limestone, the latter being of an unusually hard character. Recently, however, at a depth of 525 ft. a drift was started and this has opened up a body of galena of a fair grade running well in lead, and the owners believe that it will lead them to the main ore body. The exploration in the Lime King is to catch the famous Hill Top chute, but the ore body mentioned above is an entirely new one.

Maid of Erin Silver Mining Company.—A certificate of incorporation of this mine was filed this week; the incorporators are: David H. Moffat, Geo. E. Ross-Lewin and Eben Smith; the capital stock is placed at $3,000,000 of 600,000 shares, fully paid and non-assessable. The directors of the company are: D. H. Moffat, J. A. McClurg, Thos. Keely, Eben Smith and Geo. E. Ross-Lewin. D. H. Moffat is the president of the new organization which is to acquire stock in the Henriett & Maid Consolidated Mining Company. A deed was also placed on record showing that the latter company

had transferred to the new company the Henrietta lode and the Maid of Erin lode.

Mosquito.—The attention of mining men generally is being attracted toward this section of our district, as the mineralized area shows strong indications of being largely gold bearing. The veins of that section were in the early days mined from the grass roots; as depth was gained a pyritiferous mineral came in, and at present markings the ore is found in the contact between quartzite and porphyry and by following in on this contact most of the good paying mines of the district have been opened up.

Pawnolas.—Some important exploration work is being carried on in the Pawnolas mine; a diamond drill is being put down the main shaft and is already in over 360 ft., and the cores that are now coming up are satisfactory. Shipments are light at present but a deal of development work is being carried on in hopes of catching the rich ore chute met in the up-raise some months ago.

Star of Hope Mining Company.—This company, having its offices and properties in this camp, was incorporated this week by H. McCoy, A. B. Humphrey and Willis A. Barnes, with a capital stock of $4,000,000, divided into 800,000 shares, issued as full paid and non-assessable. The directors are: A. McCoy, A. B. Humphrey, Willis A. Barnes, John P. Jones, Chas. R. Bissell, A. V. Bohn and A. T. Nye.

FLORIDA.

Phosphates.

Shipments for phosphates for the quarter ending March 31st were: Hard rock, 47,133 tons; pebble, 22,553; total, 69,686 tons. The shipments are in long tons.

Luraville Phosphate Company.—This company has been organized at Luraville, Suwannee County, with $100,000 stock, and has bought a tract of 320 acres. The officers are: P. A. McIntosh, president and treasurer, Thomasville, Ga.; T. J. McIntosh, superintendent and general manager, Luraville, Fla.; J. Wyman Jones, George S. Chapin, George S. Dana, C. B. Parsons, P. A. McIntosh and Thomas L. McIntosh, directors.

Marietta Phosphate Company.—This company has completed the changes in its plant by putting in new log washers.

GEORGIA.

Lumpkin County.

Chestatee.—Work continues on the canal at this mine and very good returns are reported.

Thomas County.

Georgia Phosphate and Mining Company.—The works of this company at Boston were recently sold. The machinery is to be moved to a new site, and will be started up as soon as possible.

IDAHO.

Boise County.

Gold Hill Mill.—According to the "Anaconda Standard" this mill has closed down for the first time in 20 years. It is said that the shutdown will be but temporary.

Horseshoe Bend Coal Fields.—Many claims have been located on the coal lands at Horseshoe Bend, on Payette River, and enough work has been done on them, it is said, to demonstrate the fact that they are valuable.

Wolverine Mining Company.—The main or working shaft of the Wolverine and Crown Point mines is down 600 ft., where some ore was found, but not enough to justify the company in continuing under the present heavy expenses unless the shoot opens up larger in the drifts. The trustees of the company, who reside at Elmira, N. Y., have not yet decided whether they will put the shaft down to the 700-ft. level.

Cascade County.

Rocket Mining Company.—Capital stock, $1,000,000. Incorporators are Albert Olmstead and S. H. Hall, of Minneapolis, and Warren Flint and G. W. Hall. Office, Minneapolis. The mines are located in the Horseshoe Basin.

Idaho County.

Blanco Lode.—The vein is said to be from 10 to 15 ft. wide. Development work consists of a crosscut tunnel 65 ft. and a shaft 43 ft. deep. Further down the mountain a tunnel has been run to cut the vein at a depth of 300 ft. This tunnel is in 567 ft. and will have to be extended at least 125 ft. further before the ledge is cut. The ore is sulphurets carrying gold and silver, with a trace of copper.

Idaho Consolidated Mining Company.—This company owns the Redstone, Rowena, Myrtle, Pataha Belle and other claims. The 215 ft. tunnel on the Redstone will have to be driven some 45 or 50 ft. further before the main ledge is cut. The main ledge is about 4 ft. wide in the bottom of the shaft, which is 45 ft. deep. The ore in the shaft is similar in appearance to that in the tunnel, being largely composed of sulphurets that will average $18 to $20 to the ton.

Owhyhee County.

De Lamar Mining Company.—The official return for March is: Ore crushed, 2,868 tons; bullion produced in mill, $70,200; estimated value of ore shipped to smelters, $28,834; miscellaneous, $530; surplus realized on bullion estimates, $9,090; total revenue, $108,654. Expenses were $43,131, leaving $65,523 estimated profit for the month, or £13,372. The directors have declared an interim divident of 1s. per share for the three months ending March 31st, and a bonus of 6d. per share, making, for the financial year ending March 31st, a total distribution of 4s. 6d. per share, or at the rate of 22½% per annum.

Poorman Group.—On the Oso claim a winze has been sunk 350 ft. from the mouth of the Oso tunnel, to a depth of 100 ft., and a cross-cut run 49 ft. west to the east wall of the Oso ledge, and then a drift run 190 ft. south on the ledge. The drift is in virgin ground and has opened a large body of high grade ore the entire distance.

Ralph Mining Company.—A strike of importance is expected to have been made on the Ruth mine belonging to this company. The mine is now opened by a tunnel 800 ft. long.

KENTUCKY.

Coal.

(From our Special Correspondent.)

Mr. Merrill Ring is forming a syndicate in London to buy a tract of 22,000 acres along the Rockcastle River in Laurel and Pulaski counties, and to work the coal deposits. The property is not far from the Louisville & Nashville Railroad, and could be connected with that line by a short branch. It is claimed that there are two seams of coal, respectively 30 in. and 50 in. thick, and that the coal is of a good coking quality. The price named is about $7.50 per acre, the sellers to have also an interest in the stock.

MICHIGAN.

Copper.

Centennial Mining Company. — The crosscut toward the Osceola lode from the 31st level is progressing rapidly; 126¾ ft. were driven in March, and probably about the same progress will be made in April, says the Houghton "Gazette."

Houghton Copper Works.—At the special meeting of the stockholders of this company held at Marquette, April 21st., at which 8,000 shares were represented, the following directors were elected: Daniel H. Ball, of Marquette; E. T. Dravo, of Pittsburg; R. M. Hoar, of Houghton; Franklin Farrell, of Ansonia, Conn., and Edward Ryan, of Hancock. The board of directors then held a meeting and organized with Mr. Farrell as president and Mr. Ball as secretary. It was decided to sell the real estate and wind up the affairs of the company.

National Mining Company.—A mass of copper of about 25 tons weight has been discovered in this mine.

Iron—Marquette Range.

Chapin Iron Company.—A large sized Marion steam shovel for loading ore from stockpiles has been received. The present working force is about 1,100 men, and the daily product has been reduced owing to a crowded condition of the stockpile grounds, says the "Current." D shaft has just been completed to the back of the 9th level.

Keel Ridge.—There are about 2,000 tons of ore in stock and the exploratory work still continues. A crosscut has been driven south from the shaft 162 ft. A crosscut to the north from a point 800 ft. west of the shaft cut a large stream of water and a diamond drill is at work in the crosscut drilling an almost horizontal hole to the north, says the Norway "Current."

Lake Superior Iron Company.—At the west shaft on Section 21, prospecting is being done with a diamond drill. It is said that the ore of this section is very irregular and that the diamond drill is far from satisfactory. At the east shaft a drift is being run south from the 450-ft. level, at the rate of 100 ft. monthly. The drift is wide so that a track can be put in. The Winthrop company found ore near this place, and the Lake Superior company expects to strike the same body.

MINNESOTA.

Gold.

According to the Tower "Journal," Mr. S. R. Williams is about to make extensive explorations for gold in the district lying between the Tower and Rainy rivers. Auriferous quartz has been found in this region, but as yet no vein of consequence has been discovered.

Iron—Mesaba Range.

Moose Iron Company.—Two more pits have been bottomed in blue ore on the north forty of this company.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

Joplin, April 24th.

Mining operations throughout the lead and zinc belt were somewhat retarded by heavy rains and windstorms during last week. The output and sales of ore were below the average. The zinc ore market declined 50 cents to $1 per ton, the average price paid was $21 per ton. Lead ore declined and closed at $22.75 per thousand. Following were the sales from the different camps: Joplin mines, 1,868,630 lbs. zinc ore and 259,190 lead, value $24,714. Webb City mines, 324,570 lbs. zinc ore and 28,120 lead, value $3,878. Carterville mines, 1,572,320 lbs. zinc ore and 44,180 lead; value $15,916. Zincite mines, 103,200 lbs. zinc ore and 6,880 lead, value $1,207; Oronogo mines, 136,230 lbs. of lead, value $3,007; Carthage mines, 90,900 lbs. zinc ore and 34,010 lead, value $1,783; Wentworth mines, 44,190 lbs. zinc ore, value $452; Galena Kerns mines, 1,935,000 lbs. zinc ore and 245,750 lead, value $25,002; district's total value 75,959. Aurora, Lawrence County mines, 1,092,210 lbs. zinc ore and 100,820 lead, value $11,208; lead and zinc belts, total value $87,167.

The new development of the Spring City mining district, south of Shoal Creek, in Newton County, is still attracting great attention. Many parties who own tracts of land in this vicinity are looking up the locations of their property and some are leasing out the land to mine operators, while others are prospecting their land by drilling. The Kansas City, Fort Scott & Memphis Railroad is now surveying and locating a branch line through this new district, which, it is said, will be built immediately; this will be of great advantage to the producing mines of Spring City, as now the ore has to be handled by wagons a distance of seven miles for shipment.

The next point of new development has been made between Joplin and Webb City by Messrs. Lichliter and Leur, who secured a lease on 160 acres of land and commenced drilling. Two of the drill holes have penetrated a deposite of zinc ore on which a development shaft will at once be sunk; this will make almost a continuous line of development from Galena, Kan., through Joplin, Webb City and Carterville. The Blendville Mining Company located on a 40-acre tract of land in the south part of the city and north of the Maluska. This company was organized and the mines developed under the direction and management of Mr. W. S. Higham, of the Ruby Mining and Smelting Company, after several shafts were sunk and the lead and zinc ore beds opened up. A large ore-dressing and concentrating works was put up. Work was then suspended owing to bad weather, but last week the pumps were started and the ground will soon be drained so that mining can be commenced on the lead and zinc ore beds already opened up. The company expect to make a large and steady production from now on.

MONTANA.

Cascade County.

Tiger.—The upraise is rapidly nearing completion. At present ore is only being taken from the winze but the machinery ordered is now at the mine, and as the force has been increased to 25 it is expected that stoping will soon commence.

Deer Lodge County.

Tiger Lode.—The Butte, Anaconda & Pacific Railroad Company commenced a suit on April 20th against M. E. Collins for the condemnation of a right of way over the Tiger lode claim.

Jefferson County.

Blacksheep Mining Company.—This company has acquired by purchase the Beefstraight and Shamrock lodes.

Great Belt Mining Company.—This company has been recently incorporated in New Jersey, to work mines near Cole's Camp. Capital, $250,000 in 5,000 shares. Incorporators: Ira B. Wheeler, Hall Bell, David H. Coles; president, Moretz B. Phillips and Massena Bullard agent. Principal office Jersey City, branch office, Cole's Camp, Mont.

Young American Mining Company.—This company has been incorporated. Capital stock, $1,000,000 in 500,000 shares, which are assessable. Incorporators: E. W. Cabbage, G. W. Hunt, Henry Blum, W. G. Rice and John Cabbage. The company will operate the mine in the Cataract district, the head office being at Butte.

Lewis & Clarke Count.

Montana Gold and Gem Mining Company.—This company is now working the Emerald Bar mine with forty men, and producing some fine sapphires.

St. Louis Mining and Milling Company.—The case of this company vs. the Montana Company, Limited, was begun before the U. S. Circuit Court on April 22d. It is one of the most important mining cases ever brought into court in the West, and involves over $1,000,000. The St. Louis company commenced its suit against the English company some time ago, alleging that the latter corporation had been going outside of its own lines and working underground into plaintiff's territory. The St. Louis company asserts that a valuable amount of ore has been taken from its ground by the defendant, and it wants to be reimbursed. For several weeks a number of experts appointed by the court have been making examinations of the workings of both companies and will tell in court what they know about the case.

Whitlach-Union-MacIntire Mining Company.—About May 1st the company will start up the mill. By the middle of summer over a hundred men will be employed in the mine and mill; 18 are now at work in the shafts and drifts, besides the men necessary to run the machinery above ground. The main shaft is down 368 ft., and five levels have been started and are in quite a distance. The ore is free-milling and easily mined. A 13 days' run and clean-up produced a retort weighing 191 oz., which returned $2,878.36 in gold and $19.62 in silver.

Silver Bow County.

Anaconda Mining Company.—Surveyors have mapped out the boundaries of the Humboldt, which adjoins the Stella and the work of erecting a shaft house has already begun. During the last five years no work has been done on this property, but a 200-ft. shaft will now be sunk and the mine thoroughly developed.

Blue Bird Mining Company.—Preparations are being made at the mill to treat a very large quantity of tailings by the leaching process. It is said that work at the mine will begin in July.

Boston & Montana Mining Company.—This company has decided to issue 25,000 shares of stock to represent the money put in the Great Falls plant.

Butte & Boston Mining Company.—During the past week the company began operations on the Vermont claim in the Ground Squirrel district. A shaft-house is being erected on the ground, and when completed suitable machinery will be erected for the working of the property. As yet the shaft is only a few feet in depth.

Colorado Mining and Smelting Company.—The shaft at the Gagnon mine is now 25 ft. below the 1,000-ft. station. It is expected that the 1,100-ft. level will be reached about the latter part of next month. A station will be cut and exploration work prosecuted at this level, but it is believed that the shaft will be developed without any delay to the 1,200-ft. level, says the "Daily Inter-Mountain." The pump shaft below the 1,000 is being made larger than it is above that point. Very little water is encountered in sinking.

Glengarry No. 2.—About 100 tons of ore are being hoisted to the surface each day and taken to the Heinze smelter for treatment; 48 persons are at work.

New Silver Crown Mining Company.—In our issue of April 1st we stated that Mr. Wm. Wilson, of Butte, had recently issued a circular warning the stockholders against Mr. L. Galitzki and Edward Simpson, the promoters of this company, and counselling them against paying the last assessment and that the property is worthless. Against this Mr. Galitzki, the president, and C. S. Cranson, Edward Simpson and W. H. Trippet, trustees, issued a counter-circular on April 12th, denying the allegations of the first circular, and stating that Wilson's attack was inspired by malice and a plan to get possession of the mine for himself and others. This circular is too large to be quoted, but it contain affidavits and letters tending to prove that the mine is as stated and that it was the discovery of a rich blind lead that induced Wilson to conspire to get possession of the property.

NEVADA.

Esmeralda County.

Mount Diablo Mining Company.—The last received official weekly letter says: We have stopped all prospecting work in the mine. The hanging stope on the sixth level shows rather less ore than it did last week; the ore in the hanging of the stope has nearly given out where we started to sink on it; we have a foot of $40 ore showing in the west end of this stope. The foot stope on the sixth east shows 6 in. of $50 ore in the west end. The intermediate stope between the fifth and sixth levels shows a few inches of $40 ore. The fifth east is giving a little $40 ore from a small bunch. We have started to sink on the ore in the fourth east and have a small amount of $60 ore showing here. The stopes above the third west are giving a good deal of $35 ore. A small quantity of $40 ore is being taken from the stope above the third east. The second east is turning out some $35 ore; the ore in the main stope above this level has almost given out and we will stop work here in a day or so unless it improves. The stope on the second west shows a few inches of $40 ore. The stopes above the first west are giving a few tons of $40 ore. The mill has been shut down for one day during the week to allow us to clean flues.

(From our Special Correspondent.)

Mt. Diablo Mining Company, Candelaria.—A shipment of bullion consisting of 6,344 fine oz. of silver has been received at the San Francisco office.

Lincoln County.

Bullionville Mining and Reduction Company.—This company has a leaching plant running on 150,000 tons of tailings, said to contain 15 oz. of silver and $2 per ton in gold. The company has started a leaching plant of 25-tons capacity, which uses the hydro-sulphite process and by which is saved 80% of the value of the tailings. Mr. Godbe reports that the mines in Pioche are looking well. He does not think that the Pioche Consolidated smelter will ever be started again, as it cannot be made to pay. There is not enough lead in the ore to flux it, and the expenses of hauling the product over the desert is so great that it does not pay.

Magnolia Mining Company.—This company, composed of the discoverers of the Magnolia, El Dorado and Monkey Wrench mines, has made arrangements with a Minneapolis company by which the old Hiko mill, situated 20 miles west of Helene, can be rented, and the work of putting it in running order will commence immediately. The mill is equipped with 10 stamps weighing 900 lbs. each, 12 pans, 6 settlers, a large 30-ton ore scale, complete assaying and retorting outfits, ore chutes, tanks, platforms, etc. This will give the miners and prospectors in the vicinity of Hiko an opportunity of having their ore worked, as it is too low grade for shipping as a rule. Seven men have been put to work in the Magnolia mine at Helene breaking ore from the stopes. There are 400 tons of ore on the dump which will average $60, and with the present condition of the mines the mill can be kept running steadily.

Storey County—Comstock Lode.

(From our Special Correspondent.)

The scandals in connection with mining on the Comstock seem to be never ending. One, similar in essence to the notorious Hale & Norcross suit, although differing much in detail, threatens to overwhelm at least one of the principals in that unsavory suit, and possibly will implicate others. Readers of the "Engineering and Mining Journal" will remember that when Morris Hoeplich, the mining magnate and stock manipulator, died last year by his own hand, it was found that practically he was a bankrupt. His brother has now arrived from Germany and begun suit to recover property which, he claims, was owned by the dead man, but has now apparently disappeared.

The following is the weekly tabulated statement of ore hoisted from Comstock mines and milled, with the car and battery assays, bullion shipments, etc.:

Mines.	Tons H'st'd.	Car Assay	Tons Mil'd	Av. Bat'ry Assay.	Bullion for Week.	Bullion Shipped
Belcher....	20	.....	.....	.....	.....	.....
C. C. & Va.	645	$38.44	630	$32 63	.....	.....
Justice.. ..	[1]	.....	64	17.11	.....	.....
Kentuck..	100[2]	.....	.....	.....	.....	$2,196
Potosi.....	143	23.84	200	22 71	.....	.....

[1] No report of quantity, etc. Washoe mill starts up on Monday. [2] This amount being shipped daily to the Santiago mill, which started up Tuesday.

Kentuck Mining Company.—The work going on in this mine is of an interesting nature, but very little information regarding the progress made is being volunteered. The 1,100-level of the Kentuck & Jacket is looking very well, and the indications are said to be most encouraging.

Potosi Silver Mining Company.—An improvement in the east cross-cut, 850 level, is reported. The ore assays from $7.50 to $35 per ton. It is in the raise from the 1,000 level where the greatest improvement is looked for. Here the bunches of ore show much better and are now averaging $36 per ton in gold.

NEW MEXICO.

Grant County.

American Turquoise Company.—This company has a small force of men at work on its mines in the Burro mountains. The Silver City "Southwest Sentinel" reports that some fine stones are being taken out.

Carlisle Gold Mining Company, Limited.—The Carlisle mines and reduction works are offered for sale. The mill is 60 stamps, driven by a 150-H. P. engine. It has also 36 Frue vanners. The property has produced in the past nearly $3,000,000. For further information see our advertising columns.

Taos County.

(From an Occasional Correspondent.)

Rio Hondo District.—A 12-ft. vein has just been struck in the Independence mine, owned by Seaton, Fuller and others. They have been running a cross cut through syenite since Septemper last to cut the contact and have about 50 ft. still to run. The vein matter is decomposed porphyry mixed with galena and lead carbonates. The pay streak is about 12 in. wide of carbonate of lead running well in silver.

The Bijou Company have sunk their shaft over 60 ft. and are now cross-cutting to the main vein. This property is also a carbonate.

Wm. Fraser is working two shifts and has driven his tunnel about 350 ft. on the vein on his copper property. This vein is wide, a crosscut of 80 ft. failing to reach a wall. The vein matter shows gray copper and carries gold.

The Taos Mountain Company has just put a new pump and whim on the Lone Star claim in Hawkeye Gulch. The shaft is now 65 ft. deep, and a contract has just been let to sink another 100 ft. and to run two levels on the vein. The vein is about 12 ft. wide. The ore carries gold, with iron and copper stains.

The Rio Hondo Gold Mining Company are now running their advertisement for patent on 621 acres of placer ground in the Rio Hondo, and have also laid out a townsite called Amizett.

The snow is yet too deep to allow of any prospecting except in the lower ranges, but quite a number of men are waiting here for it to melt. There are rumors of a mill or two, and extensive placer workings, but nothing authentic is known on the outside.

OHIO.

Coal.

Receivers were appointed at Columbus on April 24th for the Ohio Coal Exchange Company and the Crescent Coal Company. The assets of both are $400,000 in bills receivable, open accounts, coal and money in banks. The Ohio Coal Exchange offices are in Chicago. The company has no mines, but does a brokerage business in coal in the Northwest.

OREGON.

Jackson County.

(From our Special Correspondent.)

Willow Springs.—A remarkable strike was made early in the present week at Willow Springs. A lucky prospector named Jacob Herchberger discovered a vein of mineral by accident that is said to have netted him $2,000 in the three days he has been at work. The ore is reported to be exceedingly rich, but how much there may be of it remains to be seen. The hills are covered with prospectors and it is expected that the county will have a boom during the coming season. At Hammersly ledge from $20 to $40 per day is being made per man, with old fashioned hand mortars.

PENNSYLVANIA.

Anthracite Coal.

Luke Fidler Colliery.—Owing to the recent heavy rain and to falls of rock in an old abandoned gangway in No. 1 slope, Luke Fidler Colliery, at Shamokin, a body of water had accumulated which broke through the chain pillar into the lower workings of No. 2 slope on April 19th. No damage was caused beyond the stoppage of the colliery for the balance of the day.

(From our Special Correspondent.)

The National Boring & Drilling Company, of Scranton, has completed the drilling of an 8-in. bore hole, a depth of 390 ft., to the Red Ash vein, at the Nottingham colliery, near the hoisting shaft. This hole was very successfully drilled through hard rock by the company's new shot process. All of the culm that is made each day at the Nottingham breaker will be flushed through this hole, for the purpose of filling up solid all of the old chambers in the section of the mine where the bore hole is located. As soon as this filling is completed, a new shaft, 22 ft. long by 12 ft. wide, will be sunk to the Red Ash vein. This shaft will be located east of the team road leading from Main street to the breaker, and south of the railroad tracks. This new shaft will be used for pumping purposes, and for hoisting and lowering the workmen, and for letting down timber and supplies.

Delaware & Hudson Canal Company.—This company is opening a new colliery near its present No. 2 colliery at Plymouth. The shaft will be sunk to the bottom or Red Ash vein, which is in excellent condition in this section, and is from 20 to 23 ft. in thickness. It is stated that the breaker to be erected for this new colliery will be a very large one, and that only the Red Ash vein will be mined at this colliery for some time to come.

Lehigh & Wilkes-Barre Coal Company.—Up to the present time steam has been used exclusively for operating pumps in the mines of this company, but owing to the large amount of water that has now to be handled at this company's Nottingham colliery at Plymouth, and the long distance that steam has to be carried to reach the pumps in the lower workings, the loss of power from condensation is so great, and the heat of the steam interferes so much with the ventilation, and has such a deleterious effect upon the pillars and timber, that it has been decided to operate all the pumps in the lower workings of this colliery by means of compressed air. For this purpose the Ingersoll-Sergeant Drill Company is building two duplex, high pressure Corliss air compressors, guaranteed to deliver 10,500 cu. ft. of free air per minute at 45 lbs. reservoir pressure, with the consumption of 566 lbs. of dry steam per minute. The steam cylinders of this plant are 28×48 in., and the air cylinders 34¼×48 in. The air cylinders will be furnished with the Ingersoll patent piston inlet cold air admission valves. The frames are to be of the girder type, and tsrong enough to withstand the severest strain of air compressor work. Each pair of compressors is to be coupled at 90° to a 13 in. shaft. Each duplex compressor is to have a square rim flywheel, 20 ft. in diameter, made in sections. The valve gear of each compressor is to be of the Corliss liberating type, and is to be controlled by a governor of the flyball type. The air cylinders will be provided with Sergeant's patent unloading device, by means of which the compressor runs light when full volume of air is not being drawn from the receiver. The compressor house will be erected near the Nottingham hoisting shaft, and the following lengths and sizes of pipe will be required to convey the compressed air from the receiver to the pumps: 1,860 ft. of 14-in. pipe, 2,100 ft. of 12-in. pipe, 800 ft. of 10-in. pipe, and 1,400 ft. of 8-in. pipe—a total of 6,160 ft. The plant is expected to be in operation by June 1st next.

Plymouth Coal Company.—This company is filling with culm large areas of worked out territory at their Dodson colliery at Plymouth, by means of a line of 6-in. pipe running down the shaft and along the gangways and up the breasts. The culm is flushed in with water.

Red Ash Coal Company.—This company is driving a gangway to the boundary of its property in the Skidmore vein, with the intention of mining all of the coal in this vein, without leaving any pillars. As soon as the gangway reaches the boundary, an outlet for air will be driven up the pitch of the vein to the outcrop, and then the coal all along the upper side of the gangway will be mined until the outcrop of the vein is reached; the mine car

track will be moved up the pitch as the mining progresses, and the strata overlying the worked out space below the track will be allowed to fall. The Skidmore vein is from 3 to 4 ft. thick, and the gangway that is being driven is 12 ft. wide. There does not appear to be any good reason why this system of mining should not be generally adopted in this region, where the surface is of little value and the character of the veins and overlying strata will permit. The Red Ash Coal Company's experiment, we believe, will be profitable, and will undoubtedly be watched with considerable interest.

SOUTH DAKOTA.

Lawrence County.

Golden Reward Mining Company.—This company has announced its 17th regular monthly dividend of two cents per share, aggregating $5,000, and a total to date of $85,000. The company in the past few years has purchased a large amount of valuable ground, its property now consisting of many hundreds of acres, nearly all of which is well developed. To this company and its management the Black Hills are indebted for the adoption of the chlorination process for the treatment of the silicions or dry ores which exist in this section.

Iron Hill Mining Co.—The diamond drill will soon be put in operation for deep prospecting. The extensive development work has clearly demonstrated that the dry ore deposit in this property is an extensive body. This deposit was reached at a depth of 60 ft., and has been prospected to a vein depth of 140 ft. without showing any signs of diminishing. The last important strike was made on the 160 ft. level in the vein, and shows a strong shoot of very rich horn silver ore, carrying silver and gold to the amount of $150 per ton.

UTAH.

Summit County.

Crescent Mining Company.—A large tonnage of both first and second class rock has accumulated during the winter, and the mine looks much better than it did when shut down last fall. The developments on the 400 level are very promising both in quantity and quality. While the vein was quite poor on the 300 level, it has regained its strength and improved in richness on the 400.

Toole County.

Bullion.—This mine is said to be doing well. About a month ago a strike of ore was made in the shaft at 200 ft. in depth. Since that time a drift has been run on the ore 150 ft. and about 75 ft. in on the drift a winze was sunk 25 ft. At the bottom of the winze the vein is 5 ft. wide. The drift and winze are all in ore which is lead carbonate, carrying about 20 oz. in silver to the ton. Fifteen men are at present employed in the mine. The last shipment of ore from the property sold for about $32 per ton.

Mercur Mining Company.—The adjourned meeting of the stockholders of this company was held recently. The old officers were re-elected as follows: John Deane, president; H. W. Brown, vice-president and superintendent; Gill S. Peyton, treasurer, and R. L. Scannell, secretary, and these, together with J. H. Hedges, form the board of directors. The finances of the company were reported to be in an excellent condition and the mine looking well.

Wayne County.

Henry Mountains.—According to the Salt Lake "Herald," there are now about 400 men prospecting in the North Wash of the Henry Mountains. The snow has delayed operations, but it is expected that important developments will soon take place.

WASHINGTON.

Egypt Mines.—The Silver Queen now has a tunnel in about 50 ft., which is following the dip of the vein at an angle of about 45°. The ore taken out at present runs high in silver. The Phoenix has a ledge of quartz, 3½ ft. wide, between walls of granite. Work is being pushed on the Egypt mine, but so far they have not struck the ledge, the rock showing nothing but stringers of galena mixed with considerable pyrites of iron.

WEST VIRGINIA.

Randolph Coal and Coke Company.—This company has been incorporated at Beverly, to mine coal and make coke. The incorporators are: George E. Walters, C. W. Thompson and Alex. Bogny, Brooklyn, N. Y.; R. C. Budd, New York; T. H. Gimbernot, Orange, N. J.

FOREIGN MINING NEWS.

MEXICO.

Durango.

(From our Special Correspondent.)

San Andres Mining and Smelting Company.—The property of this company is located in the northwestern part of the State of Durango. One hears little of this mine, even in Durango, yet there are to-day few mines in the Republic of Mexico that have a brighter future and none, in proportion to the time the works have been in operation, that has paid its shareholders such large returns. A town, bearing the name of San Andres, has sprung up around the works, and to reach this town from the city of Durango a six days' horseback ride is necessary, while Culiacan, in the State of Sinaloa, is but three days' ride distant; but practically no business is transacted with the latter point as Durango, the home of the shareholders, who do not number over twelve, is preferred even though the distance is considerably greater. The San Andres Mining & Smelting Company produced $740,000 Mexican money during the year 1892. Of this amount $400,000 were paid as a dividend to the shareholders, leaving a surplus of $100,000 in the treasury at the beginning of this year. This company works several mines, not being dependent on any one mine for its supply of ore. The deposits are "mantas" or horizontal deposits; the ore is a galena rather low in lead, carrying much zinc and assays about one hundred and fifty ounces of silver per ton.

The plant for the treatment of the ore, which has been erected but a couple of years, consists of 14 round roasting stalls, 20 ft. in diameter, and three larger stalls 50 ft. long and 20 ft. wide; two calcining furnaces 40 ft. long for roasting "fines," set side by side so that the ore can be rabbled from one side only; one 36 in. × 50 in. water-jacket blast furnaces; two large double cupelling furnaces, giving four separate hearths or tests, and making, one might say, four distinct cupelling furnaces, with movable tops; one No. 4½ Baker blower and steam engine to run the same. Water power is used to hoist the slag from the furnace floor to level of feed floor. Each 20 ft. stall holds 90 tons of ore, and uses 60 cubic yards of wood for each roast, which requires about three weeks time. The blast furnace was originally of the usual type with lead well, slag tap, etc., but it is now running similar to an open hearth furnace. The crucible has been done away with. The bricks at one end forming the breast of the furnace have been taken out, the horizontal space at this end and at the level of the slag tap has been extended out from the furnace a foot further, making about two feet in all. This space is heaped with charcoal, which is kept replenished as it burns. From one corner of this end a continuous flow of slag runs, and from the other corner of this same end the lead is tapped every few minutes into a pot set into the ground, from which it is dipped into molds. The furnace makes no matte. The slag is very basic; no analysis of the ore or slag was known when your correspondent visited the works, and for that reason none is given. The charge is as follows: 300 lbs. roasted ore—lumps, 12 lbs. litharge, 13 lbs. refining furnace test, 20 lbs. poorly roasted iron ore, 200 lbs. slag, 125 lbs. charcoal. On an average one hundred of these charges are put through every twenty-four hours, each charge making about two bars base bullion. The slag assays from 6 to 12 oz. of silver per ton. The blast furnace is run with a very high blast pressure; the water gauge indicated 23 in. A sufficient pressure is carried to drive the flame at times beyond the throat of the furnace. There are no flue chambers or elaborate arrangement to catch flue dust that one sees in a carefully planned smelter, and especially where a strong draught is used. The campaign of the furnace is about three weeks, when it is blown out, barred out and started up again, 24 to 36 hours being consumed in this work.

Two thousand bars of base bullion make a charge for a cupel furnace, or rather this many bars are added before the silver is all withdrawn from the furnace.

Until a month ago there has not been what might be called a technical man in the employ of the company, yet the property ranks to-day among the best paying mines in the Republic; and a visit to the works will convince one that this success is due to the good management and practical experience of the man who has had charge of the company's interests since work at the mines was begun four years ago, and who is still the superintendent and general manager.

COLORADO ORE MARKET.

Denver. April 24.

(From Our Special Correspondent.)

For the two weeks ending April 24th, the receipts of ore in this market offered for competitive bid by the three Pueblo sampling works only amounted to 420 tons. This decrease from the previous two weeks is due, at the present time, largely to the bad condition of the roads leading from the mines to the railroad.

A noticeable feature for the past two weeks in the market has been the active demand for all classes of lead ores showing the great scarcity. This is better illustrated by several contracts that have been made, 56 and 57 cents having been paid for lead under 30%. Of course in such cases the ore was desirable, carrying an excess in iron, which, however, was paid for.

Of straight silicious ores there was offered 180 tons, which sold at fair margins for the smelter. Medium grade silicious, carrying values of silver and gold and running about 60% silica, sold at $15 off for smelting. Of silicious lead ores carrying from 5 to 20% in lead there was offered 120 tons, which brought a good price for the lead, the average smelting treatment for the same being low. Of heavy lead ore carrying from 25% up to 50% there was offered 90 tons, which was sold at from 45 to 57c. per unit, and in the excess of the heavy lead stood no treatment charge; in the lower leads stood a very light treatment, ranging from $1 to $4 per ton.

Of copper ores there was offered 30 tons, running from 3 to 7%, which sold at 80c. per unit for the copper. Stood a treatment charge of from $10 to $13.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see page 408.]

NEW YORK, Friday Evening, April 28.

Always when a holiday causes the suspension for a day of operations at the Stock Exchanges the market does not recover at once, and an unsettled feeling prevails on the following day. Especially noticeable is this in the market for mining securities. To-day was as quiet and uneventful a day as has been experienced for many weeks.

The only incident of interest this week was the report from the Pacific Coast that better times were about to commence in the mining stock circle of that section. The usual rumors of an impending "Comstock boom" are afloat, this time based on alleged legitimate developments at two mines. These rumors have not yet been confirmed, and the market here has not been influenced by them appreciably, in so far as prices are concerned. There has been, however, a slightly better demand for the various Comstock stocks. The heaviest transactions of the week were in Comstock Tunnel stock, of which 4,000 shares were sold at 9@10c. Consolidated California & Virginia was quiet, only 200 shares being sold at $2.75@$5.2.95. Crown Point shows sales of 300 shares at $1.05@$1.10. Gould & Curry was stationary at 90c.; total sales, 200 shares. There was a solitary sale of 100 shares of Hale & Norcross at $1.30. Ophir was steady at $2.85, with sales during the week of 250 shares. Other sales were as follows: 200 shares of Savage at $1.30@$135; 110 shares of Yellow Jacket at $1@$1.35; 200 shares of Andes at 55c.; 260 shares of Best & Belcher at $1.35@$1.85; 300 shares of Bullion at 65@70c.; 100 shares of Chollar at 85c.; 500 shares of Consolidated Imperial at 10c.; 500 shares of Exchequer at 30c.; 425 shares of Mexican at $1.85@$1.90; 200 shares of Potosi at $2.40@$2.55; 300 shares of Union Consolidated at 10c.; 200 shares of Utah at 30c.

Of the California stocks Standard Consolidated shows sales of 600 shares at $1.40@$1.45. Of Brunswick Consolidated 300 shares were sold at 10c. The superintendent of the Brunswick Consolidated Gold Mining Company writes as follows from Grass Valley, Cal., under date of the 19th inst:—We are still troubled with water and have only been able to work one day in the 700 drift during the past week. The raise in the 600 level looks fairly well, but at present is considerably mixed with cab and waste.

Of the Colorado Leadville Consolidated shows sales of 900 shares at 17@18c. The gross product of this property for the month of March amounted to $4,216, of which the company received in royalties $797. According to the official lists of the Consolidated Stock and Petroleum Exchange sales of Lacrosse this week amounted to 1,500 shares at 3@4c.

Ontario was stationary at $18 with total sales of 200 shares.

El Cristo shows a sale of 100 shares at 40c. and Monte Cristo of 800 shares at $3.15.

Phœnix of Arizona was in fair demand: during the week 2,500 shares were sold at 12@13c.

Boston. April 26.

(From our Special Correspondent.)

The market for copper stocks continues to rule extremely dull and without any special feature. The proposed increase of stocks by the Boston & Montana company to relieve their financial position meets with some favor, and the stock, after selling down to $24¼ early in the week, recovered to $25½, with latest sales at par $25. The dealings in the stock have been very light this week, and it looks as if the short interest had been covered and the market left to its course on its merits. The property is undoubtedly a good one, and with proper management and abundant financial resources can be made to resume payment of dividends in the not distant future.

Butte & Boston declined from $9½ to $9 on small sales. There is evidently no disposition to speculate in it at present.

Calumet & Hecla sold at $300 early in the week, and at $294 ex-dividend ($5) with later recovery to $295. There is more stock offered at this time than usual, and under the circumstances it is well taken by investors.

Tamarack declined from $160 to $155½ for no other reason than a lack of buying orders.

Quincy sold at $120, a decline of $3. There is no support to the stock, and orders to sell can only be executed by making concessions on the price.

Osceola has been neglected this week; only small sales are reported at $32.

Centennial continues firm with good orders to buy at the market. The stock opened at $9⅛ to 9¼, declined to 8½, but rallied quickly and advanced to $9¾, with later sales at $9½. The outlook at the mine is said to be improving, which accounts for the advance in price.

Kearsarge drags heavily. There seems to be a

good deal of stock for sale and very little disposition to buy it, and so it declines easily on any pressure to sell. After selling at $8\frac{1}{4}$ in the early dealings, it gradually dropped to $6\frac{1}{4}$, recovering only to $7. The insiders, it is rumored, are trying to unload this stock, hence the decline. Franklin hold steadily at $12@$12\frac{1}{4}$ for round lots, with sales of small lots at $13. Tamarack, Jr., sold off $\frac{1}{4}$ to $19\frac{3}{4}$, Wolverine at $2\frac{1}{2}@$2\frac{3}{4}$, and National at $1. Copper Falls appeared this week at $7@7\frac{3}{4}$. Arnold sold at 50c.

3 P. M.—The market this afternoon was without special change. Calumet & Hecla sold at $297\frac{1}{2}$, an advance of $2\frac{1}{2}$. Butte & Boston declined to $8\frac{3}{4}$. Centennial sold at $9\frac{1}{4}$, Kearsarge gained $\frac{1}{8}$ to $7\frac{1}{8}$, and Tamarack advanced to $156. To-morrow (27th) the Stock Exchange is closed in honor of the Columbian naval celebration in New York.

San Francisco. April 21.

(From our Special Correspondent.)

An unexpected activity has dominated the market during the past few days. For some time past a large amount of interesting work has been carried on, and many combining incidents seem to make a strong market possible within the next month or two. The crosscutting on the 1,800 level of the Savage, the 1,100 of the Yellow Jacket and Kentuck and from the winze being sunk from the 1,565 level of the Ophir afford opportunities for developments of an important character. In Best & Belcher and Crown Point, also, indications of an encouraging nature have been encountered. That the Comstock magnates are alive to the possibilities, of course, goes without saying. The contract for the rebuilding of the Eureka mill has been let, although at the time it was burned down it was thought that, with the demoralization on the Comstock, work could very well be carried on without its aid. Another suggestive feature of affairs on the lode is found in the proposal of Mr. Mackay to make a prolonged stay in Virginia City upon his return from his Southern trip.

All these facts taken together seem to warrant the belief that the "ring" has decided to make a market in the near future. In more than one mine ore is lying all ready to be taken out, and, whenever it should please the powers that be, the stock would boom and carry the entire Comstock list with it.

Stocks are at present closely held, and the advance this week, led by Potosi and Yellow Jacket, may be, as before stated, an indication of a stronger market later on.

Many of the brokers had notified several of their clerks that their services would be dispensed with on the first of the month, but within the last day or two these decisions have been rescinded, which is another sign.

The Gold Hill and South End Comstocks have almost entirely monopolized attention in both boards. Of these Yellow Jacket, that sold for 95c. a week ago, has been the most important, selling to-day for 85c. on early call and advancing to $1.20 in the San Francisco Board, $1.45 in the Pacific, and closing strong and active at $1.50. Belcher sold for $1.30; Bullion for 40c.; Caledonia for 15c.; Challenge for 40c.; Consolidated New York for 15c.; Crown Point for $1.00; Exchequer for 15c.; Kentuck for 40c.; Occidental for 25c.; Segregated Belcher for 30c. and Overman for 30c. All the principal stocks were freely dealt in and rates ranged from one to three points in advance of last week's prices.

In the middle group of Comstocks, Potosi has been most in demand, the sales being larger, particularly in the Pacific Board. Opening at $2.25 it sold during the day to $2.45 and closed at $2.40, an advance of 85 cents on the week's trading. The remainder of this portion of the list were not so active, although advances took place in most of these stocks in sympathy with the movement at the South End. Chollar sold for 75c.; Gould & Curry for 75c.; Best & Belcher for $1.60; Hall & Norcross for $1.10, and Savage for $1.20.

Of the North Enders, Ophir has been the most active and has shown the greatest advance in price during the week. It sold to-day to $2.90, a 75c. advance on the week's trading, with large sales. Consolidated California & Virginia opened at $2.55 and closed at $2.85. Mexican ruled at $1.80, Sierra Nevada at $1.40, and Union Consolidated at $1.30.

The outside stocks have been almost entirely neglected, small lots of the Bodies having changed hands at the same rates ruling a week ago.

SAN FRANCISCO, April 28th (*By telegraph*).—The opening quotations to-day are as follows: Best & Belcher, $1.60; Bodie, 40c.; Belle Isle, 10c.; Chollar, $1.20; Consolidated California & Virginia, $2.60; Eureka Consolidated, $1.50; Gould & Curry, 80c.; Hale & Norcross, $1.15; Mexican, $1.75; Navajo, 5c.; Ophir, $2.65; Savage, $1.20; Sierra Nevada, $1.40; Union Consolidated, $1.20; Yellow Jacket, $1.20.

London Stock Market. April 15.

(From our Special Correspondent.)

A company has been formed in London called the Safety Mining and Blasting Syndicate, Limited, to purchase and develop the patents of Mr. James Macnab. Mr. Macnab's invention consists in using ordinary explosives encased in a liquid ammonia cartridge, the object being to thus obtain a flameless explosive without recourse to the expensive and special so-called flameless explosives. It is intended to introduce this system into America shortly.

The report of the Sierra Buttes mine for the half year ended December 31st, 1892, shows an excess of income of £5,313 over expenditure; of which profit Uncle Sam mine contributed £4,171. The directors recommend a dividend of 6d. per share. This distribution will amount to £3,062, and the remainder will be carried forward. The Plumas Eureka mine made a profit of £7,995 during the same half year, this sum including £4,171, the other half of the profit gained by the Uncle Sam mine. The directors recommend a dividend of 9d. per share, amounting to £5,273. The accounts of the Uncle Sam mine show, after carrying £2,000 to the reserve fund, a balance of profit transferred in two equal halves to the above-mentioned companies.

On April 7th a meeting was held of the Darien Gold Mining Company, and a resolution was carried to increase the capital of the company to £125,000 by the issue of 25,000 more shares at £2 each. The directors reported that the only alternative to this course would be to liquidate. There are two mines on this property, the North and the South, both of which used to be worked by the Spaniards. Most of the money has been spent on the North mine, but there has been no result so far, and therefore the engineer and directors recommended that the North mine be abandoned and work commenced on the South mine. It was stated that it would require £5,000 to prove this mine. The engineers and directors had no data to show that the South mine was worth working, and their only reason for recommending that it should be tried seems to have been that it must have contained enormous riches to warrant the Spaniards spending so much time and work on it.

The Indian gold mines are coming into prominence on the London market, and speculation takes place regularly in the stock of the five active producers, the Mysore, Ooregum, Nundydroog, Balaghat, and Champion Reef. These are all situated in the Colar district of the province of Mysore. Of course, the total output is comparatively small, in fact, it may be termed an infant industry. The output of the Colar district has been: 1889, 76,577 oz.; 1890, 104,932 oz.; 1891, 130,137 oz.; 1892, 163,140 oz.; 1893, first quarter, 50,963 oz. The output of the Mysore in 1892 was 64,391 oz.; of the Ooregum, 53,836 oz.; of the Nundydroog, 31,229 oz.

A meeting of the shareholders of the Palmarejo Mining Company was held April 11th to consider the advisability of issuing 50,000 more shares at £1 each. The state in which this company is at present was detailed in the last week's report. At the meeting in question the chairman announced that £42,000 had already been subscribed, but that the directors could not call a confirmatory meeting until the whole £50,000 had been guaranteed. A committee of shareholders was formed to confer with the directors, and efforts will be made to raise the small additional capital required, or failing that work will be prosecuted with the smaller amount. How much more money is going to be wasted on this mine it is difficult to say.

April 19.

The report for 1892 of the New Guston silver mine of Colorado has been published. The fall in the price of silver and the great depreciation in the ore contents have combined to lower the profits. During 1892, however, £30,250 was distributed in dividends, being at the rate of 27½% per annum. No interim dividend was declared at the meeting held April 18th. The ore raised was 14,291 tons, sold to the smelters at an average price of £3 11s. 6d., as against an average of £14 11s. per ton during 1891. The average cost of mining was £2 13s. 8d. per ton during 1892, as against £3 17s. 6d. during 1891. Arrangements are being made for exploring for higher grade ore and also for reducing the cost of mining.

The Sapphire & Ruby company of Montana is suffering in the market by the absence of the periodical reports that were promised. Desperate attempts are being made to get rid of shares on the part of first holders on the strength of Streeter's original report on the gems. Investors here would be glad to hear something of the actual doings of the company in Montana.

The Gravel gold mines of Colombia have been speculated in a good deal during the past week; and in response to the placing on the market of the unappropriated shares applications four times over the amount were received.

The directors of the De Lamar gold and silver mine of Idaho have declared an interim dividend of 1s. per share for the three months ended March 31st, and a bonus of 6d. per share. During the financial year ended March 31st the total dividend was 4s. 6d. per share, or at the rate of 22½% per annum.

At the magistrate's court at West Penarth, Cornwall, on the 15th of April, Captain Boyns, manager of the Wheal Owls mine, was fined £15 for failing to keep an accurate mine plan. It will be remembered that 20 men were drowned in this mine on January 10th last.

MEETINGS.

Church Gold Mining Company, at the office of the company, Room 4, Nevada Block, No. 309 Montgomery street, San Francisco, Cal., May 1st, at 1 P. M.

Consolidated Imperial Mining Company, at the office of the company, Room 35, Mills Building, corner Bush and Montgomery streets, San Francisco, Cal., May 3d, at 1 P. M.

Delaware & Hudson Canal Company, at the office of the company, 21 Cortlandt street, New York City, May 9th, at 12 o'clock noon. Transfer books will close April 29 and reopen May 10th.

Don Enrique Mining Company, at the office of the company in New York City, May 9th, at 12 o'clock noon.

Hudson River Ore and Iron Company, at the office of the company in New York City, May 9th, at 12 o'clock noon.

Justice Mining Company, at the office of the company, Room 3, Nevada Block, No. 309 Montgomery street, San Francisco, Cal., May 1st, at 1 P. M.

Morgan Mining Company, at the office of the company, Room B, No. 230 Montgomery street, San Francisco, Cal., May 6th, at 11 A. M.

DIVIDENDS.

De Lamar Mining Company, Limited, dividend of 37½ cents, or 1s. 6d., per share, $150,000, payable April 25th, at the office of the company, No. 6, Drapers' Gardens, London, E. C., England.

Hope Mining Company, of St. Louis, extra dividend of 25 cents per share, 25,000, payable May 1st, 1893, at the office of the company in St. Louis, Mo.

Mollie Gibson Consolidated Mining and Milling Company, dividend No. 34, of 15 centser share, $150,000, payable May 15th, at the office of the company in Colorado Springs, Colo. Transfer books close May 8th, and reopen May 16th.

METAL MARKET.

NEW YORK, Friday Evening, April 28, 1893.

Prices of Silver per Ounce Troy.

April.	St. Ex.	London Pence.	N.Y. Cts.	Value of sil. in $1.	April.	St. Ex.	London Pence	N.Y. Cts.	Value of sil. in $1.
22	4·89	38	83	·630	26	4·87½	38 1/16	83	·630
24	4·88½	38	83	·630	27	*	*	*	*
25	4·87¾	38	83	·630	28	4·87¼	38¼	83⅜	·633

* Holiday.

The volume of silver offered during the past month shows a decline of considerable amount as compared with the previous month. Owing to the high exchanges shipments of Mexican dollars to New York have for the present ceased. Resumption of shipments is expected on a favorable turn in the exchanges. An advance in the Eastern exchanges has for the moment advanced price of silver bullion.

The United States Assay Office at New York reports the total receipts of silver for the week to be 143,000 ounces.

Government Silver Purchases.

The Government has purchased during the week the following quantities of fine silver at the accompanying prices per fine ounce:

April 24th, 525,000 oz., at 83·4c. to 83·44c.
April 26th, 557,000 oz., at 83·35c. to 83·5c.

Gold and Silver Exports and Imports at New York Week Ending April 22d, 1893, and for Years from January 1st, 1893, 1892.

	Gold.		Silver.		Excess of
	Exports.	Imports.	Exports.	Imports.	Exports.
Week....	$6,024,500	$17,591	$425,600	$23,633	$6,408,846
1893.....	47,880,872	5,570,095	9,819,946	910,579	51,000,144
1892.....	14,844,320	5,901,911	7,947,709	459,452	16 430,656

Of the gold exported all but $6,000 went to Europe, principally for Austrian account. The gold imported came from the West Indies; the silver from Mexico.

The exports and imports during the five days ending April 28th, so far as ascertained, have been as follows: Exports, gold, $3,449,950; silver, $242,200. Imports, gold, $19,712; silver, $15,534. Of the gold exported $3,340,000 went to Bremen and $90,000 to Havre. The silver went to London and was almost entirely American bullion. No demands have been made upon the sub-treasury for Saturday shipments.

NOTES OF THE WEEK.

In our issue of April 22d we stated that it would be the veriest quibble to adopt the policy of paying the Treasury notes issued under the Act of July 14th, 1890 in silver only, reserving the $100,000,000 in gold for the redemption of legal tenders alone. There is, and there can be, no doubt as to the power of the Treasury Department to adopt such a policy, for the law specifically states that the Secretary of the Treasury shall redeem such notes in gold or silver at his discretion, but it is certain that the refusal to redeem Treasury notes in gold at the present time would precipitate the crisis so long feared. That this was recognized by the administration is evidenced by the uncompromising declaration of policy given to the press by President Cleveland at the beginning of the week. Of late years the occasions on which the President of the United States had opportunity to reassure the public mind and restore the general tone of commercial enterprise by a simple statement of the policy of the administration have been rare. Such an occasion has fallen to President Cleveland's lot, and he has availed himself of it with promptness and force, letting it be plainly understood that the credit of our government shall be maintained at all hazards. We quote his statement in full:

"The inclination on the part of the public to accept newspaper reports concerning the intentions of

those charged with the management of our national finances seems to justify my emphatic contradiction of the statement that the redemption of any kind of Treasury notes except in gold has at any time been determined upon or contemplated by the Secretary of the Treasury or by any other member of the present administration. The President and his Cabinet are absolutely harmonious in the determination to exercise every power conferred upon them to maintain the public credit, to keep the public faith, and to preserve the parity between gold and silver, and between all financial obligations of the government.

"While the law of 1890, forcing the purchase of a fixed amount of silver every month, provides that the Secretary of the Treasury in his discretion may redeem in either gold or silver the Treasury notes given in payment of silver purchases, yet the declaration of the policy of the government to maintain the parity between the two metals seems so clearly to regulate this discretion as to dictate their redemption in gold.

"Of course perplexities and difficulties have grown out of an unfortunate financial policy which we found in vogue, and embarrassments have arisen from ill-advised financial legislation confronting us at every turn; but with cheerful confidence among the people and a patriotic disposition to co-operate, threatened dangers will be avoided pending a legislative return to a better and sounder financial plan. The strong credit of the country still unimpared and the good sense of our people, which has never failed in time of need, are at hand to save us from disaster."

One of the most peculiar features of the situation during the past two weeks has been the attempt to induce the national banks to lend gold to the Treasury. The banks had been accused of a lack of patriotism and of a desire to impair the credit of the United States. One Senator has used the expression "the knaves of Wall street," meaning thereby not only stockbrokers, but the officials of the national banks as well. The situation has been accentuated by the daily press, who have not failed to apply harsh names to the banks. Such opinions cannot fail to work harm to the entire community. Between the government and the national banks there can be no great difference of interest, the interests of the national banks being indissolubly connected with the credit of the United States. The ability of the banks to loan money in quantity and on advantageous terms depends directly upon the credit of the United States, and anything which tends to impair the credit of the country impairs at the same time the ability of the national banks to do business. It is possible that deposits might increase owing to the universal confidence in the methods of the national bank, but it is certain that if the credit of the government became impaired the banks would have to use unusual precautions and impose a very high rate of interest upon their loans, while, at the same time, they would be compelled to refuse interest on deposits.

Viewed in another light there is no question of patriotism that can enter into the relations between the national banks and the National Treasury. The Treasury department has never aided the national banks and it is idle to call upon the officers of the banks to aid the National Treasury solely upon the ground of patriotism. The money of the banks, outside of the small sum represented by their capital, belongs to the depositors, and the use of any part of their gold to supply the government would justly be called a breach of trust. In other words, the duty of the national banks lies with their depositors, and not with the government.

If the present situation were only the result of momentary influences, or if there were any prospect of a change, it would not be out of place for the banks to supply the Treasury with a certain amount of gold. But as the present condition of affairs is the legitimate outcome of the Sherman silver purchase act, gold will continue to flow from us so long as this act continues in force. Consequently what benefit could accrue to the banks by giving the Treasury $20,000,000 or $30,000,000 in gold? This amount will assuredly leave us in the very near future, and at its end more will probably be demanded; not only the government, but the banks as well will be in a worse condition than at present.

The whole situation may be summed up by saying that while the National Treasury is responsible to the country at large, the national banks are responsible only to a limited number of depositors and stockholders; such being the case it is idle to say that the national banks should become responsible for the financial policy of the country at large.

On August 10th the Hungarian Finance Minister sold 12,000,000 florins of the gold rente to the Rothschild syndicate at the rate of 96⅞. As the first sale was at the rate of 91⅞ the government has, owing to its accumulation of gold, been enabled to place its present loan at a 5⅞ increase over the first. The syndicate receives a bonus of ¾%, which, combined with the 4% difference between the present loaning rate and par value of the rente, enables it to obtain the gold from this country even although the sterling rates of exchange be slightly unfavorable. At the present writing the Hungarian Government requires about 25,500,000 florins in gold to complete what is known as its currency reform. The Austrian correspondent of the London "Statist" says: "The Rothschild syndicate will be very cautious in the acquisition of gold to avoid even the slightest disturbance of the international money market."

He continues: "In all branches of business a steady revival is observed. In the north of Austria two new iron and steel works are being established, and in Bosnia the first iron and steel works is being founded. Many new manufactories have been established, and several copper and gold mines have been enlarged."

In connection with the investigation being made by the "Engineering and Mining Journal" in regard to the amount of foreign capital invested in this country, the report of the Union Pacific Railroad is of unusual interest. Among other things it states that of its capital stock 171,975 shares are held in New England, 217,350 in New York, 172,975 in England, and 201,088 in Europe. The amount held in England shows a decrease of 13,700 shares over the amount held last year.

The "Engineering and Mining Journal" was the only paper which, on Saturday, April 22d, stated that the Treasury had received sufficient offers of gold to make the $100,000,000 reserve fund intact. This news we received by special telegraph from Washington, and in giving it we antedated our daily contemporaries from one to three days.

Domestic and Foreign Coin.

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

	Bid.	Asked.
Mexican dollars	$.65¼	$.66¼
Peruvian soles and Chilian pesos	.59¼	.60
Victoria sovereigns	4.85	4.88
Twenty francs	3.86	3.89
Twenty marks	4.74	4.78
Spanish 25 pesetas	4.80	4.85

Copper.—This week there has been another important drop in the price of copper, due to the fact that while since early in December last the Calumet & Hecla people have remained out of the market, they have now come in and sold to consumers at 11c. a heavy quantity, said to be nearly 10,000,000 lbs., for delivery over three or four months. As consumers have for some time been but poorly stocked with metal they have evidently thought it best to take in considerable now, and having done this, will naturally be out of the open market for awhile. This, in turn, must have an effect, as most of the Lake producers, other than the C. & H., have been holding back with selling, and many now find themselves loaded up with a lot of metal which they will, of course, have to try and dispose of. Lake copper, we have therefore to quote at 11c. with sellers over, while electrolytic copper, of good quality, is rather scarce, and firmly held at 10¾@⅞ according to brand and quantity. For casting grades there has been a good and steady demand, and none is now to be had below 10⅜@½, while Arizona pig copper (96%) is nominally quoted at from 9·04@9·50.

Recently the demand for fine copper for export has been considerably greater, and as rather large quantities have been sold, the exports for the next few months will be much heavier than for the past six.

The London market remains rather dull, and G. M. B.'s have declined to £44 12s. 6d. for spot and £45 for three months prompt, the refined and manufactured sorts being quoted as follows:

English tough, £47 10s.@£48; best selected, £48 10s.@$49; strong sheets, £55 10s.@£56; India sheets, £51 10s.@£52; yellow metal, 4⅞d.

The exports of copper from the port of New York during the past week were as follows:

To Liverpool—	Copper Matte.	Lbs.	
S. S. Runic	6,226 bags	643,511	$29,000
" Arizona	6,348 bags	726,940	32,000
" Aurania	7,473 bags	871,250	39,000
To London—	Copper.	Lbs.	
S. S. Mohawk	18 casks	22,500	$2,502
To Hamburg—	Copper.	Lbs.	
S. S. Rugia	350 pigs	104,210	$10,400
" "	93 plates.	11,264	1,239
To Havre—	Copper.	Lbs.	
S. S. La Champagne	1 cask	1,727	$195
" Corrientes	90 casks	112,500	13,500
To Stettin—	Copper.	Lbs.	
S. S. Bohemia	324 plates	44,881	$5,147
To Rotterdam—	Copper.	Lbs.	
S. S. Obdam	8 crates	11,310	$1,302
" "	36 bbls.	45,000	5,400
" "	793 pigs	219,045	21,800
" Veendam	265 pigs	70,904	7,100
" "	414 bars	133,439	13,000
" "	167 plates	22,490	2,586

Tin is again disappointing its friends, the market having declined on rather large sales to 20 ⅝@¾ for April-May, with June ⅜ higher. The consumptive demand is still good and from incoming steamers large shipments are regularly made direct inland. Shipments from the East to America are no longer feasible, while those from London are kept down owing to the prices that are asked and which are much above the parity of those ruling here.

In London Straits Malacca tin is quoted at £93 7s. 6d. for spot delivery and £93 10s. for May, three months prompts being obtainable at £88 10s.

Lead.—The market has been rather erratic and is now considerably lower. Some sales were made at 4c., and even a little less, and at these figures there is a slightly better demand, but most sellers ask 4·05c. Anyhow, there has been rather much pressure to sell, and this continuing there is little prospect of improvement, although present demand is very good and most probably in excess of production.

The foreign market is a trifle easier, Spanish being quoted at £9 13s. 9d. and English at £9 16s. 3d.

Chicago Lead Market.—The Post, Boynton, Strong Company telegraphs us as follows: Market has been much weaker. Sales have been made at $3.90 spot and futures. Market closes steady with $3.90 asked.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead practically stationary during past week with few retail sales at from $3.87½ to $3.85. The market looks very tame.

Spelter.—Current rumors regarding the breaking out of the strike expected to commence the 1st proximo are rather vague, but it seems as if hostilities would be delayed. Still, makers are not at all free sellers and have quite materially advanced their prices. Business has been done at 4¼@·35 East St. Louis, equalling 4½@·60 New York.

Antimony continues to be very dull, it being possible to sell only in small quantities, Cooksou's at 10¾, L. X. at 10⅝ and Hallett's at 10c.

Nickel.—The market is rather dull and to be quoted at 45@50c. according to brand and quantity.

Quicksilver.—There is nothing new to report of this market, which continues quiet. Quotations are as follows: New York, $39.50; London, £6 15s.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, April 28, 1893.

Pig Iron Production.

Fuel used.	Week ending April 28, 1892.		Week ending April 28, 1893.		From Jan., '92.	From Jan., '93
Anthracite.	94	38,970	73	34,310	623,520	535,680
Coke.	164	138,990	146	134,595	2,223,840	2,129,560
Charcoal	55	11,820	36	8,623	156,169	139,284
Totals	313	189,780	255	177,528	3,003,529	2,804,524

Northern brands: No. 1, $14.50@$15.25; No. 2, $13.75@$14.50; Gray Forge, $12.50@$13.00. Southern: No. 1, $14.25@$14.50; No. 2 F. $13@$13.50; No. 1 soft F., $13.25@$14; Gray Forge, $12@$12.50 tidewater. Scotch irons: Coltness, $21.50@$22; Eglinton. $19.50@$20.

The failure of the Pennsylvania Steel Company and of the Maryland Steel Company came as a clap of thunder from a clear sky. It was not known, except, perhaps, to a very few, that any such possibility as a receivership lay before these companies. The shares of the Pennsylvania Steel Company sold on March 20th at $120; the receiver was appointed on the 21st, and the shares fell at once to $100, with no bidders.

The company is capitalized at $5,000,000, of which $4,500,000 has been paid in. The debt of the company amounts to $4,000,000, and the secured indebtedness to $1,000,000. The plant and machinery are valued at $3,000,000, accounts receivable amount to $1,000,000, and the stock on hand is said to be worth $2,000,000. The annual business of the company is about $8,000,000, and it employs 4,400 men.

The financial condition of the Maryland Steel Company is about as follows: Original cost of property and plant, $6,500,000; bills receivable, $500,000; raw material and manufactured products on hand, $2,000,000; total assets, $9,050,000; mortgage (secured), $2,000,000; floating debt (unsecured), $1,600,000; total liabilities, $3,600,000.

The failures do not seem to have been caused by any lack of profitable work, but by the great stringency of the money market. This has to some extent been lessened since the determination of President Cleveland to keep the country on a gold basis, but will not pass away entirely until there is a revival of business.

There has been no depression in the iron or steel markets consequent upon the failure of these great establishments, as prices are already as low as they can go without bankrupting the iron and steel trades. It is not likely that the embarrassment of these companies is permanent, and certainly there is no reason to fear a panic in the iron market.

Quotations are:

Billets and Rods.—Steel billets, tidewater, $25.25@$25.50; foreign, $29@$29.50; wire rods, $33.50@$34; foreign, $40@$40.50; Swedish, $52@$53.

Manufactured Iron and Steel.—Angles, 1·8@2c.; axles, scrap, 1·90@2·10., delivered; steel, 1·85@2c.; bars, common, 1·55@1·60c.; refined, 1·65@1·9c. on dock; beams, up to 15 in., 2@2·15c.; 20 in., 2·35@2·4c.; car truck channels, 2@2·10c.; channels, 2·10@2·20c., on dock; hoops, steel, 1·8@1·9c., delivered; links and pins, 1·85@2·10c.; plates, bridge, 2@2·10c; fire-box, 2·5@2·8c.; flange, 2·25@2·50c.; marine, 2·50@2·75c.; sheared, 1·85@2·10c.; shell, 2·10@2·25c.; tank, 1·8@2c.; universal mill, 1·85@1·90c.; tees, 2·30@2·60c., all on dock.

Merchant Steel.—Quotations are: Tool steel, $6 50@$6.75 and upward; tire steel, $2@$2.10; toe calk, $2.30@$2.40. Bessemer machinery, $2.10@$2.20. Bessemer bars, $1.70@$1.75; open hearth machinery, $2.30@ $2.40; open hearth carriage spring, $2.10@$2.20; crucible spring, $3.75@$4.

Old Material.—Rails, iron, $16.50@$17; steel,

$13@$13.50; No. 1 scrap, $15.75@$16; car wheels $12.50@$13 f. o. b. Jersey City.

Rail Fastenings.—Fish and angle plates, 1·55@1·60c. at mill; spikes, 1·9@1·95c.; bolts and square nuts, 2·45@2·50c.; hexagonal nuts, 2·55@2·60c. delivered.

Spiegeleisen and Ferromanganese.—10 to 12% Spiegel, $22@$22.50, 20% $25@$25.50. Ferro, 80% $57@$57.50.

The Cambria Iron Company, Johnstown, Pa., will begin the manufacture of ferromanganese from Caucasian ore.

Steel Rails.—$29 mill or tidewater. Girder rails, $31@$33. Steel rails fit to relay can be had for $20.

Buffalo. April 27.

(Special Report from Rogers, Brown & Co.)

An increasing interest in market conditions is being evinced by buyers.

The steady stream of orders for small amounts continues, but some good-sized contracts are being placed and there are not a few evidences that there are more to follow in the near future.

Interest in Lake Superior charcoal iron is picking up as the season of navigation approaches. From some sources come predictions of a scarcity of that metal. We quote for cash f. o. b. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, $14.50; No. 2 X foundry strong coke iron, Lake Superior ore, $13.75; Ohio strong softener No. 1, $14.50; No. 2, $14; Jackson County silvery No. 1, $17@$17.30; No. 2, $16.30@$16.80; Lake Superior charcoal, $16.75; Tennessee charcoal, $18; Southern soft No. 1, $14; Alabama car wheel, $19; Hanging Rock charcoal, $20.50.

Chicago. April 27.

(From our Special Correspondent.)

One of the most portentous strikes happening in this vicinity, and one which may have considerable bearing on crude iron is the molders' strike. Some 1,200 of the machinery and general molders have demanded a minimum rate of $2.75 a day for bench and floor work,and with several exceptions foundrymen generally have refused to pay the advance. At this writing there is no appearance of an early settlement. In less than a week the effect of this strike will be seen in the local market and the demand for pig iron will be materially curtailed. The structural iron-workers' strike is practically at an end, all the most prominent firms yielding to the men's demand for shorter time. The master boilermakers have also decided to adopt a shorter workday and no further trouble is looked for.

Pig Iron.—The trouble between the foundrymen and molders is an established fact and demand for pig iron is now very light. Even last week there were evidences of coming trouble—orders were for small lots, and business generally was of a much lighter character. Outside trade holds up fairly well, yet to that there is a deal of irregularity. Here some consumers are requesting furnaces to hold up on shipments for a while, others are ordering increased deliveries, and there are some who are increasing their orders.The amount of inquiry for Southern coke iron is small,sales light and further concessions have been made to buyers. Some agents are of opinion that deeper cuts will have to be made to relieve the accumulated stocks, and state it is impossible to tell where the end will be. Lake Superior charcoal iron is still very slow. There is some inquiry but it does not fructify into business. Prices while easier are quotably unchanged.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, $16.50@$16.75; Lake Superior coke, No. 1, $13.75@$14.00; No. 2, $13.25@$13.50. No. 3, $12.75@$13; Lake Superior Bessemer, $14.75; Lake Superior Scotch, $14.50@$15; American Scotch, $16.00@$16.50; Southern coke, foundry, No. 1, $14.25; No. 2, $13.00; No. 3, $12.50; Southern coke soft, No. 1, $13.00; No. 2, $12.75; Ohio silveries, No. 1, $16.50; No. 2, $16.00; Ohio strong softeners, No. 1, $16.75; No. 2, $16.25; Tennessee charcoal, No. 1, $17; No. 2, $16.50; Southern standard car wheel, $19.50@$20.

Steel Billets and Rods.—Inquiry is extremely light, and prices nominal only at $25 for billets and $32.50 for rods.

Structural Iron and Steel.—There is a very fair volume of business in progress, but orders are not large and several big contracts are still pending. A heavy amount of elevated railroad work will soon be ready to let. Quotations, car lots, f. o. b. Chicago, are as follows: Angles, $1.85@$1.90; tees, $2.15@$2.25; universal plates, $1.90@$1.95; sheared plates, $1.90@$1.95; beams and channels, $1.95@$2.25.

Plates.—Probabilities are there will be no boilermakers' strike. Business from mill and warehouse continues very unsatisfactory, with nothing encouraging in sight. Steel sheets, 10 to 14, $2.25@$2.35; iron sheets, 10 to 14, $2.20@$2.30; tank steel, $1.90@$2; shell iron or steel, $2.50@$2.75; firebox steel, $4.25@$5.25; flange steel, $2.75@$3; boiler rivets, $4@$4.15; boiler tubes, all sizes, 60%.

Merchant Steel.—An implement concern placed an order for nearly 1,000 tons this week, with others to follow. Inquiry is quite active, and mill agents are busy figuring on season's specifications. Quotations are: Tool steel, $6.50@$6.75 and upward; tire steel, $2@$2.10; toe calk, $2.30@$2.40. Bessemer machinery, $2.10@$2.20. Bessemer bars, $1.70@$1.75; open hearth machinery, $2.30@$2.40; open hearth carriage spring, $2.10@$2.20; crucible spring, $3.75@$4.

Galvanized Sheet Iron.—Demand is well maintained from mill and warehouse, but discounts have relaxed, being now quoted at 70 and 10 and 5% off on charcoal, and jobbing quantities at 70 and 7½% off on the former and 70 and 10% off on the latter.

Black Sheet Iron—Is in light demand. Jobbers appear to have filled most of their needs for summer delivery. Price is easy at 2·80c. for mill lots, Chicago. Jobbing quotation is 3·10c. for iron and 3·10@3·15c. for steel of the same gauge.

Bar Iron.—Demand is quite good but some mills continue to yield to pressure. Several 500 to 1,000 ton contracts were placed last week, shipments to be completed by July 1. Regular mill quotations are 1·50@1·55c. base Chicago, but some insist on 1·55c. Warehouse lots are filled at 1·65@1·75c. for iron or steel bars.

Steel Rails.—Orders are still confined to small lots of 500 to 2,000 tons. The steel mills here look for a larger volume of business later on. Prices remain steady at $30@$31.50. Quotations on iron and steel splice bars are 1·55@1·60c.; track bolts, square nuts, 2·55c.; hexagon, 2·65c.; spikes, 2·05@2·10c. according to style.

Nails.—Mill agents report enlarged demand and eastern Ohio makers are now equalizing freight with Cleveland factories equal to $1.62½, base Chicago delivery. Jobbers quote $1.70@$1.75 in less than carloads. Steel cut nails are also in better demand, but prices irregular at $1.30@$1.35 Chicago from mill. Jobbers quote $1.40@$1.45 from stock.

Scrap.—Dealers note an increased demand but without improvement in price: Railroad, $15; No. 1 forge, $14; No. 1 mill, $9.50; fish plates, $15.50: axles, $19.50; horseshoes, $15; pipes and flues, $7; cast borings,$5.50; wrought turnings,$8; axle turnings,$9.50; machinery castings, $10; stove plates, $6.50; mixed steel, $10; coil steel, $15; leaf steel, $15.50; tires, $14.50.

Old Material.—Offerings of iron rails are said to be very light; consumptive demand poor and prices merely nominal at $18@$18.25. Old steel rails are quiet at $11@$14.50, according to length and condition. Car wheels are moving in a small way at $14.25@$14.50.

Louisville. April 22.

(Special Report by Hall, Bros. & Co.)

There is really nothing new in local iron circles. Sales are light: buyers think there is nothing to warrant heavy purchases for forward delivery, whereas, on the other hand, something might be gained by covering necessities from month to month. Prices remain about the same. Grey forge can be had for delivery through the year, basis $8 at furnace.

Hot Blast Foundry Irons.—Southern coke No. 1, $13@$13.25; Southern coke No. 2, $12@$12.25; Southern coke No. 3, $11.25@$11.50; Southern charcoal No. 1, $15.50@$16; Southern charcoal No. 2, $15@$15.50.

Forge Irons.—Neutral coke, $10.75@$11; mottled, $10.50@$10.75.

Car Wheel and Malleable Irons.—Southern (standard brands), $17.50@$18.50; Southern (other brands), $16.50@$17; Lake Superior, $18@$18.50.

Philadelphia. April 27.

(From our Special Correspondent.)

Pig Iron.—Prices are low, but for standard brands firmer than they have been for several weeks, owing to the buying up going on. There is no actual scarcity even of fine brands, except for prompt delivery. No. 1 runs from $14.75 to $15.25; No. 2, $13.75 for Southern to $14.50 for Northern; Forge, $12.50 for ordinary, to $13.25. The consumptive demand, to all appearance, is on the increase.

Steel Billets.—Confidence is not strong among buyers in the maintenance of present selling prices for either Western or Eastern billets. Buyers offer $24. There have been no large sales.

Muck Bars.—Activity developed within 48 hours and quite a number of small sales were made at $22.50.

Merchant Bars.—If the car builders buy as much iron next week as they have asked for within the past week there will be some large orders to record. Prices are about the same.

Skelp.—Fair demand in a small way at $1.52½.

Wrought Iron Pipe.—A large amount of business is done, but at very low prices. Electrical requirements are becoming a very important factor in this branch, and a large volume of business from that quarter is in sight.

Sheet Iron.—All kinds of sheet iron and all grades are in good demand. Some large summer orders are about being placed. Prices are firm on store lots, but so much cannot be said on mill business.

Plate and Tank.—Large orders for summer delivery are in sight, and the manufacturers are already after it. Except for small orders prices have not improved, and probably will not. Tank runs from 1·80 up; shell, 2·10; flange steel, 2·25. Mills are pretty well supplied with business.

Structural Material.—Very little stirring news is at hand, but much business is near that will run into thousands of tons. Angles, 1·80; beams, ties and channels, 2c.

Steel Rails.—Standard. $29, no business. Girder rails, $35; several small sales.

Old Rails.—Dull and plenty at $18.

Pittsburg. April 27.

(From our Special Correspondent.)

Raw Iron and Steel.—Business during the week was not very active. The iron failure in the eastern part of the State has set parties to inquire what will happen next. So far as known no Pittsburg parties are expected to suffer. At present there is very little that is new in the market for iron and steel. Reports from the leading centers throughout the country show a continuance of a heavy consumptive demand for both crude and finished products, with prices still low and unsatisfactory to the majority of producers.

The iron ore situation remains unchanged; buyers and sellers are still apart in their views, although the easier feeling in steel stock has somewhat weakened the attitude of the ore men in regard to the season's rates. Secretary Evans, of the Valley Iron Manufacturing Association, reports that the total shipments for the year 1892 from the Valley rolling mills was 473,987 tons and the receipts 1,025,139 tons. From the blast furnaces 511,121 tons were shipped outward and 1,780,883 tons were received; the total receipts and shipments were 3,998,600 tons.

The next question for the iron men to decide will be the iron scale for the year that begins on the first of July. Will the old scale be paid or will the manufacturers demand a lower scale of prices? These are important questions; the time for settlement of the same is now at hand. It is certain that prices of both iron and steel are lower than they were one year ago.

Finished Material.—Dealers report a fair business doing, but the orders received are for small amounts; prices remain at a standstill. The rates quoted for many weeks past are still current.

Structural Material.—The demand is slowly improving in the building line, no change in values being reported.

Coke Smelted Lake and Native Ore.

Tons.	Cash.
5,000 B., at Valley Furnace, Aug. to Dec...	$12.90
3,000 B., May, June...	15.70
2,500 B., May, June...	13.70
3,000 B., City Furnace.	13.85
2,000 B., May, June...	13.65
2,000 B., Aug. to Dec..	13 50
1,500 B., April, May...	12 65
1,000 B., April, May...	13.60
1,000 B., prompt.....	13 65
1,000 G. F.....	42.25
1,000 G. F., extra.....	12.50
1,000 G. F., all ore....	12 75
800 B., May, June...	13.75
800 B., May, June...	13.55
500 B., prompt.....	13.85
500 G. F.....	12.25
400 No. 1 F.....	14.00
400 No. 2 F.....	13.00
250 No. 3 F.....	12.75
200 W.	11.50

Charcoal.

75 C. B.....	26.50
75 C. B.....	26 50
50 No. 2 F.....	18.80
50 No. 3 F.....	18.50
50 Extra F.....	28.00
50 C. B.....	25.00

Blooms, Billets and Slabs.

2,000 B., April, May, June, at mill.....	$22.80
1,500 B. May, June, at mill.....	22.50
1,000 B. and S., April, May, at mill....	22.75
1,000 B. and S., May, June, at mill....	22.35
200 B., May, June, at mill.....	22.50

Muck Bar.

Tons.	Cash.
400 N.....	$24.15
350 N	24.10
300 N.....	24.20

Skelp Iron.

650 W. G	1.50	4 m.
450 N. G..... ..	1.50	4 m.
300 S.....	1.70	4 m.

Ferro-Manganese.

150 80% del.....	59.20

Steel Wire Rods.

1,000 5-G. Am., del.....	31.00

Steel Skelp.

1,500 W. G.....1.40		4 m.

Blooms, Billets and Bar Ends.

Tons.	Cash.
500 B. ends.....	15.25
300 Bar ends.....	15.25

Sheet Bars.

2,000 May, June, at mill	29.00

Spelter.

100 Spelter, July....	4.37½

Old Iron and Steel Rails.

500 I. R....	19.25
500 I. R.....	19.00
500 S. Mixed lengths	14.50
150 S., long.....	15.50

Scrap Material.

600 No. 1 R. R. W. S. net.....	15.25
300 C. S., gross.....	18.00
150 C. S., gross.....	11.50
100 C. B., gross.....	8.00

COAL TRADE REVIEW.

NEW YORK, Friday Evening, April 28.

Statement of shipments of anthracite coal (approximated) for week ending April 22d, 1893, compared with the corresponding period last year:

	April 22, 1893. Tons.	April 23, 1892. Tons.	Difference.
Wyoming region.....	393,609	377,688	Inc. 15,921
Lehigh region.....	158,735	96,533	Inc. 42,202
Schuylkill region.....	230,662	188,158	Inc. 42,504
Total.....	763,006	662,379	Inc. 100,627
Total for year to date.	12,377,912	11,248,217	Inc. 1,129,695

PRODUCTION OF BITUMINOUS COAL for week ending April 22d and year from January 1st:

Shipped East and North:	1893. Week.	1893. Year.	1892. Year.
Phila. & Erie R. R.....	2,461	39,055	29,853
Cumberland, Md.....	91,976	1,168,882	1,081,371
Barclay, Pa.....	1,216	22,328	63,478
Broad Top, Pa.....	12,486	248,333	188,654
Clearfield, Pa.....	97,639	1,328,571	1,163,926
Allegheny, Pa.....	31,585	413,272	366,171
Beach Creek, Pa.....	26,754	588,355	852,871
Pocahontas Flat Top.....	66,504	874,698	767,133
Kanawha, W. Va.....	48,303	983,7 0	743,656
Total.....	378,944	5,667,794	5,257,113

Shipped West:	1893. Week.	1893. Year.	1892. Year.
Pittsburg, Pa.....	24,036	408,389	410,061
Westmoreland, Pa.....	36,733	659,474	472,428
Monongahela, Pa.....	9,283	210,089	153,750
Totals.....	73,650	1,277,952	1,036,239
Grand totals.....	452,594	6,945,746	6,293,352

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending April 22d, 1893, and year from Jan. uary 1st, in tons of 2,000 lbs.: Week, 102,437 tons; year 1,761,958 tons; to corresponding date in 1892, 1,810,011 tons.

Anthracite.

At the meeting of Western coal sales agents in this city, on the 25th inst., the price of coal was reduced 50c. per ton. The new schedule takes effect at once. At Buffalo the new prices will be: broken, $4.40; other sizes, $4.65; at Chicago: broken, $5.50; other sizes, $5.75. No definite action was taken as to the price at the mines, although it is understood that a reduction of 35c. per ton may be made. Eastern prices, of course, remain unchanged. The output for May was recommended to be 2,750,000 tons, as against 3,531,121 tons in May, 1892. Since the money market has taken on better indications, the coal trade is looking up also.

It is, perhaps, a strange state of affairs that the recent misunderstanding, to say the least of it, as to the course of the government in regard to the gold reserve should influence the coal trade, and yet when one considers how much money the trade needs for carrying on its daily business, and how varied and wide-spreading its ramifications are, there is no cause for surprise. The indecision that seems to mark the mental attitude of some high officials during the past two weeks unquestionably reacted upon all of the great arteries of domestic commerce, the anthracite coal trade among them, and coal now commands fully 10 cents a ton more than it did a week ago.

Reports as to the cutting of circular rates are prevalent, and we have reason for believing that liberal concessions have been made by prominent operators, and that favorable terms can even now be had. This is a custom which, for the good of the trade, it would be well to abandon. Once the circular rates have been established at prices fairly remunerative, and no one expects or wishes the coal men to earn a less interest on their money than other traders, they should be maintained. A cut here, a cut yonder, a concession to this man and a concession to that one, finally bring the trade into a feverish condition and a general collapse is apt to follow.

If there is need of a circular in the first place there is also need of abiding by its regulations. But when the circular prices are too high and there comes upon the purchasing public a sense of oppression, cutting is sure to follow, and justly too, for to insist upon quotations which do not truthfully represent the prices at which coal can be bought is ridiculous.

Coxe Bros., in their suit against the Lehigh Valley for alleged freight discriminations, had another hearing before Henry P. Brown, Master, April 25th. Mr. Charles Hartshorne, formerly president of the Lehigh Valley, was examined in reference to the merging of sundry small roads into the Lehigh Valley system, and some other less important matters, and the hearing was adjourned to May 2d.

What is Mr. McLeod doing? And what is Mr. Harris going to do? And will the coal sales agents advance the price in July as was reported? These and various other like questions cannot be answered now. The receivers of the Reading have asked permission to buy 2,500 coal cars. Authority to issue receivers' certificates cannot be given until May 9th, if then, as time was granted for the filing of the amended application. It is said that Mr. Welch's plan for the reorganization of the Reading will be published within a few days, but as yet it is not definitely known just what it is.

The trade is in a fair condition. Reading's shipments for week ending April 22d were 405,000 tons, of which 25,000 were for Port Richmond and 75,000 for New York waters. Water freights from Port Richmond are $1 to $1.25 and discharge to Boston, and 70@80c. to Providence.

Prices are as follows:

Philadelphia.

	Broken.	Egg.	Stove.	Chestnut.
Hard white ash	$3.75	$3.75	$3.90	$3.90
Free white ash	3.65	3.65	3.90	3.90
Shamokin	...	3.90	4.10	3.90
Schuylkill R. A.	....	4.00	4.25	4.00
Lykens Valley	4.50	5.25	5.50	4.75

New York.

	Broken.	Egg.	Stove.	Chestnut.
Hard white ash	$4.00	$4.00	$4.15	$4.15
Free white ash	3.90	3.90	4.15	4.15
Shamokin	....	4.15	4.35	4.15
Schuylkill	....	4.25	4.50	4.30
Lykens Valley	4.75	5.50	5.75	5.00

Pea, $2.75; No. 1 Buckwheat, $2@$2.10; No. 2 Buckwheat, $1.25@$1.50.

F. o. b. prices are quoted as under:

	Schuylkill.	Shamokin.	Red Ash.	Lykens Valley.
Lump and Steamboat	$2.20	$....	$....	$....
Broken	2.25	...	2.95	2.95
Egg	2.45	2.45	3.05	3.30
Stove	2.60	2.85	3.15	3.55
Chestnut	2.50	2.55	2.55	2.90
Pea	1.25	1.25	1.25	1.60
Buckwheat	0.75	0.75	0.75	1.30

Bituminous.

Some contracts are still pending and operators are not inclined to make concessions beyond the usual rates at this season of the year. As the time for holding the World's Fair approaches it is evident that there may be a serious interruption to current shipments, and on this account some large dealers are holding out for maximum prices. The car service is still capable of improvement, not only in the actual number offered, but, and probably on account of this, in the time consumed in the round trip.

The Maryland Bureau of Industrial Statistics, A. B. Howard, Jr., chief, has published its first annual report. In explaining the prosperous and contented condition of the miners, Mr. Howard is of the opinion that the law compelling the mine owners to pay employés the full amount of their wages in the legal tender of the United States has had a most happy effect. The mining population is composed largely of emigrants from England and Germany, but few negroes being employed. The negro forms less than 3% of the total population of Garrett and Alleghany counties, which embrace the coal districts. The Maryland coal field is between Savage and Dan's Mountains. It is about 25 miles long and about 5 miles wide, but actual mining operations are confined to less than half of this area.

The following table gives the shipments from the Maryland mines in 1892, and the number of men employed, according to this report:

	Tons.	Men.
American Coal Co.	384,681	390
Anthony Mining Co.	10,664	25
Barton & G. C. V. C. Co.	201,364	279
Big Vein Coal Co.	66,683	100
Borden Mining Co.	253,629	300
Consolidation Coal Co.	912,787	1,120
Franklin Cons. Co.	72,117	125
George's Creek Coal & Iron Co.	297,632	426
Maryland Coal Co.	280,945	401
New Central Coal Co.	201,428	265
Potomac Coal Co.	137,737	169
Piedmont Cumb. Co.	14,563	65
Swanton Mining Co.	5,162	50
Union Mine	176,995	225
Total	3,016,388	3,980

In 1891 the shipments were 3,820,239 tons. There were nine fatal accidents in 1891 and six in 1892. The price for mining is 50 cents per ton of 2,240 lbs., which, with 13 cents outside expenses, brings the cost of coal f. o. b. mines to 63 cents.

There is a fair demand for vessels here. We quote prices and rates as under:

Prices in New York harbor are from $3.10@$3.15, and at lower tidewater ports $2.50@$2.60.

Charter rates are: New York to Rhode Island, 65@75c.; to Boston, 75@90c. Philadelphia to Sound ports, $1.10@$1.15; to Boston, $1.15; to Portsmouth, $1.25. Baltimore to Sound ports, $1.10@$1.15; to Boston, $1.20@$1.25.

Boston. April 27.

(From our Special Correspondent.)

In anthracite there is but little doing as yet, dealers still holding off, anticipatiug presumably that prices will be lower ere long. They do not look for higher prices anyway, and thus feel secure. Stocks in retail dealers' yards have in consequence run down quite low, and when they do come into the market to buy it will not be in small lots. Prices are steadily maintained by the companies.

Prices quoted here are the net f. o. b. prices at New York: Stove, $4.15; egg, $3.90; free broken, $3.90; chestnut, $4.15; Lykens Valley (at Philadelphia), broken, $4.85; egg, $5.45; stove, $6.00; chestnut, $5.00.

In bituminous there is very little that is new or different to note from last week. The large consumers are still holding back from placing contracts with the purpose probably of securing coal at lower prices a little later. Spot coal is strong at $3.90@$4.00 for George's Creek and $3.65@$3.75 for Clearfield.

Freight rates are somewhat lower than noted a week ago. From New York they are from 70 to 80 cents; from Philadelphia, $1.10@$1.20; from Baltimore. $1.15@$1.25; from Newport News and Norfolk, $1.00@$1.10.

The retail trade is but fair. Prices remain as last reported.

The receipts of coal at this port for the week ending April 22d were 34,191 tons of anthracite and 35,624 tons of bituminous, against 41,265 tons of anthracite and 9,381 tons of bituminous for the corresponding week last year. Since January 1st the receipts have been 441,945 tons of anthracite and 342,664 tons of bituminous, against 554,986 tons of anthracite and 179,617 tons of bituminous for the corresponding time last year.

Buffalo. April 27.

(From our Special Correspondent.)

There was much trouble at the docks and chutes on our river and harbor during the week, the result of a shortage in the supply of anthracite coal. Many vessels were delayed in consequence and much grumbling prevailed.

The anthracite coal trade quiet. Bituminous active and quotations steady.

The following are the quotations for anthracite coal, commencing on May 1st: F. o. b. vessels at Buffalo, per ton of 2,240 lbs.: grate, $4.70; egg, stove and chestnut, $4.95. On cars at Buffalo or Suspension Bridge, per 2,240 lbs.: grate, $4.40; egg, stove and chestnut, $4.65.

The retail quotations on May 1st will be as follows: Retail, per ton of 2,000 lbs., screened and delivered in city limits: grate, $5; egg, stove and chestnut, $5.25, and pea, $4.

The shipments of coal by lake from the opening of navigation to Saturday last, inclusive, aggregated 107,236 net tons, distributed as follows: 60,287 to Chicago, 30,549 to Milwaukee, 3,900 to Duluth, 5,850 to Toledo, 600 to Detroit, 5,050 to Green Bay and 1,000 to Gladstone. The rates of freight were 60c. to Chicago and Milwaukee, 25@30c. to Toledo, 60@50c. to Green Bay, 50c. to Gladstone, Sault Ste. Marie and Duluth; also 40c. to Saginaw and 45c. to Kincardine.

The severe gales on the lakes last Wednesday and Thursday caused the loss of many lives and vessels of the estimated value of $400,000. Reports from several crafts have yet to be received, but it is hoped that the list is complete. Included in the losses are many tons of coal.

The Welland canal opened April 24th; the Western Division of the Erie Canal will be opened May 3d; the Eastern Division May 5th; the Middle Division, uncertain.

Advices from Sault Ste. Marie say the cold weather continues and that navigation on Lake Superior will not be opened before May 5th at the earliest.

The Consumers' Gas Company, of Toronto, have advertised for tenders for 25,000 net tons of Youghiogheuey or Westmoreland lump gas coal and 5,000 net tons of grate size, screened Buck Mountain or Cross Creek authracite coal, to be delivered between May 1st and November 30th, 1893, either on vessel at Toronto or on cars at Suspeusion or International bridges.

Vessels chartered for Duluth and Superior have in nearly all cases cleared light.

Connellsville coke is selling on cars here in car loads, per 2,000 lbs., at $4.30 for foundry and $4.65 for crushed.

Chicago. April 27.

(From our Special Correspondent.)

As a result of the meeting of sales agents in New York on Tuesday, April 25th, the price for all sizes of anthracite coal except grate, on and after May 1st, was fixed at $5.60 per net ton, and grate $5.35, in wholesale quantities on track. To dealers the new circular will be $5.50 at shippers' yards. This is just the reduction which was anticipated would be made, and some of the agents of the individual companies have been putting in coal to dealers with a guaranty as to the opening prices. This action on their part has enabled them to get rid of a good deal of all-rail coal. Shippers look forward to a fair volume of trade during May, not only from the country and dealers, but from consumers generally.

The requirements of Chicago for the season of 1893-4 will be much larger than last year, not less probably than from 225,000 to 300,000 tons. This is a careful estimate. The storm of last week was disastrous to a number of coal carrying vessels consigned to this port. The cold weather has to a certain extent stimulated wholesale and retail trade, the former in one to three car lots and the latter in one to several tons.

Bituminous coal continues in very fair demand for the season for both domestic as well as steam varieties. The fact is, the protracted cold and wet weather necessitates the consumption of a large amount of fuel, and the requirements have been such that this market has been relieved of most of the coal which has been pressing for sale. There is already a marked improvement in Hocking coal and the overstock has been largely disposed of. This week there was some inquiry for the "spot" article, one large shipper being entirely out. The climatic conditions have also had a very beneficial effect on the market. On account of anticipated trouble with the miners in Ohio large shipments of Hocking coal are expected this week and shippers are urging coal forward. On and after May 1st the price of this grade will be $3.10, though under the present condition of the soft coal market those figures may not be maintained. There is trouble brewing in the Indiana block coal field and the miners will probably strike, as they refuse the operators' offer of 75c. per ton May 1st to November 1st and 80c. for the following six months. Demand is only fair, and mine-owners urge that the smoke ordinance in this city has greatly impaired their trade, hence they cannot afford to make any further concessions. The mines in the central part of Illinois are working from half to two-thirds time and shippers report a better demand. In northern Illinois and particularly the Wilmington district, the men are making good time, are well satisfied and from present indications there will be no trouble in this state.

Coke is in very poor demand, as most of the shippers have restricted shipments, partly on account of the strike and partly because foundries are well supplied.

Quotations are: $4.65 furnace; $5.05 foundry, crushed; $5.40 Connellsville; West Virginia: $3.90 furnace, $4.10 foundry; New River Fouudry, $4.65; Walston: $4.65 furnace, $5 foundry.

Circular prices are at the following rates: Lehigh lump, $6.00; large egg, $5.35; small egg, rauge and chestnut, $5.60. Retail prices per ton are: Large egg, $6.75; small egg, range and chestnut, $6.75.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, $3.35; Hocking Valley, $3.10; Youghiogheny, $3.25; Illinois block, $2.50; Brazil block, $2.50.

Pittsburg. April 27.

(From our Special Correspondent.)

Coal.—The coal miners are still at work. The first week in May will probably decide whether there will be a strike for the half cent or not. The action to be taken by the railroad coal miners at the meeting to be held this week is awaited with much interest; it is considered sure that an increase of 5 cents a ton will be demanded, and also that the

operators will refuse to grant it. With this state of affairs another big strike is not at all unlikely. There has been coal shipped by water daily since our last report; there is still a good stage of water, and the present weather favors a continuance for some time.

Connellsville Coke.—Trade since our last has been exceedingly dull, and the blame for it cannot be shifted onto the railroad companies for not furnishing transportation facilities. The operators had all the cars they wanted, but they did not have sale for the coke. The fact that 200 ovens were fired up during last week is no indication that their owners had, or expected to have, a better demand for coke; this week an equal number are being blown out, and by May 1st it is very likely that the list of ovens will not exceed the 5,000 mark. The crushed coke trade has dwindled down with the approach of the spring and summer months, and after the first of next month the crushers will be practically closed until fall. The shipments for the week aggregated 114.627 tons, distributed as follows: To Pittsburg, 1,530 cars; points east of Pittsburg, 1,450 cars; points west of Pittsburg, 3,058 cars; total, 6,033 cars. Western shipments declined 288 cars, Eastern shipments 88 cars, and Pittsburg 160 cars, leaving a net decrease of 536 cars. Production was reduced 4 per cent.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, April 28.

Heavy Chemicals.—This market continues quiet and devoid of features of especial interest. During the week there was a better demand for carbonated soda ash and alkali for future delivery. Caustic soda was quiet, as was also bleaching powder. Prices show no change from last week. We quote: Caustic soda, 60%, 2·95@3·10c.; 70%, 2·70@2·80c.; 74%, 2·72½@2·82½c.; 76%, 2·80@2·90c. Carbonated soda ash, 48%, 1·40@1·60c.; 58%, 1·35@1·40c. Alkali, 48%, 1·35@1·40c.; 58%, 1·30@1·40c., according to package. Sal soda, English, on the spot, 1c.; American, ·90@·95c.; bleaching powder, 2·25@2·50c.

Acids.—The good business in the acid market which we reported last week continues unabated, although there is no scarcity of acid, as many would have us believe. The features of the trading are the same as they have been for some time past, and prices show no change whatever this week. Our quotations are as follows: Acid, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, $1.87½@$2, according to quality; muriatic, 18°, 90c.@$1.10; 20°, $1@$1.25; 22°, $1.25@$1.50; nitric, 40°, $4; 42°, $4.50@$4.75; sulphuric, 90c.@$1.10; mixed acids, according to mixture, oxalic, $6.30@$6.50. Blue vitriol is quoted all the way from $3.25 to $3.75; glycerine for nitro-glycerine, 11½@12½c., according to quality and quantity.

Brimstone.—There is nothing new to report of this market, which continues very quiet. Quotations are as follows: Best unmixed seconds on the spot, $19.75; shipments, $19.25. Thirds are 75c. less.

Fertilizing Chemicals.—A better demand has been experienced in the fertilizer market during the past week, but it has been for small lots, and, on the whole, the trading has been of a hand-to-mouth nature, as consumers have not yet abandoned all hopes of a still further decline in prices. The ammoniates are somewhat lower in price than at the time of our last report. The various potash salts controlled by the syndicate are scarce owing to delayed shipments, and prices of goods on the spot are higher, although the schedule quotations, fixed by the syndicate, show no change. Our quotations this week are as follows: Dried blood, $2.75@$2.08 per unit for high grade, and $2.70@$2.75 for low grade; azotine, $2.90; sulphate of ammonia on the spot, $3.20@$3.22½ for gas liquor. No bone liquor is offering. Acidulated fish scrap, no stocks on hand; dried scrap is quoted at $29.50 f. o. b. fish factory. Tankage, high grade, $27@$29; low grade, $26@$28. Bone tankage, $24@$25; bone meal, $24@$25.50

The price of double manure salts as fixed by the syndicate is as follows: New York and Boston, $1.12; Philadelphia, $1.14½; Charleston and Savannah, $1.17 cwt., basis 48@50%, in 50 ton lots on foreign weights and analyses. Sulphate of potash, 90%-96%, basis, 90%: New York and Boston, $2.07; Philadelphia, $2.09½; Charleston and Savannah, $2.127, sulphate of potash, 96-99%, basis 90%, is 4% higher.

Phosphates.—Quotations for high grade land rock, f. o. b. Charleston, are $4.50@$4.75. Freights are $1.25.

Muriate of Potash.—There were no arrivals of muriate during the past week. There is a scarcity of stocks on the spot owing to delayed shipments, and holders are asking from $1.83 to $2.25, according to quantity. The prices fixed by the syndicate for 1893 are as follows: New York or Boston, $1.78; Philadelphia, $1.80½; Southern ports, $1.83.

Kainit.—This market is very quiet. Quotations for shipments previous to September are as follows: New York, Philadelphia and Boston, $8.75 for foreign invoice weight and test, and $9 for actual weight; Charleston, Savannah and Wilmington, $9.50 for invoice weight and test, and $9.75 for actual weight. Shipments after September 1st, 25c. higher.

Nitrate of Soda.—The nitrate market is practically unchanged. Goods on the spot are held at $2.35. Shipments and arrivals are according to position.

Liverpool. April 19.

(Special Correspondence of Jos. P. Brunner & Co.)

The position of heavy chemicals is not very satisfactory at the moment, the demand being light, and in some cases prices show a rather easier tendency. Soda ash is dull, and ammonia alkali is rather easier. The nearest spot quotations are about as follows: Caustic ash 48%, £4 17s. 6d.@£5 5s. per ton; 57 to 58%, £5 15s. per ton. Carb. ash 48%, £5@£5 5s. per ton; 58%, £5 7s. 6d.@£5 15s. per ton; ammonia ash 58%, £4 15s.@£5 per ton, less 2½%, all net cash. Soda crystals are slow of sale at £2 17s. 6d.@£3 per ton, less 5%.

Caustic Soda.—Orders are scarce and makers find a difficulty in moving off stocks. Quotations continue very irregular, depending upon quantity and export market. The nearest spot range is about as follows, viz.: 60% £8 5s. to £9 per ton; 70% £9 5s. to £10 1s., per ton; 74% £10 5s. to £11. 76% £11 10s. to £12; all net cash. For parcels under 10 tons, 5s. per ton extra is charged.

Bleaching Powder.—Is in small compass, and firmly held at £8 10s. to £8 15s. per ton, for hardwood packages, net cash.

Chlorate of Potash.—The spot demand has fallen off again and the position is not quite so firm. Resellers are offering for prompt delivery at 8¾d., but it is difficult to find buyers. There is a fair inquiry for May-June, but without much actual business reported, and nearest values for this delivery are about 8½d.@8¾d. For July-December 7¾d.@8d. is range. For both this and next month chlorate of potash is in very small compass and it would not take very much to set the market booming again.

Bicarb. soda is in good request and firm at £6 15s. per ton, less 2½% for one cwt. kegs, with usual allowance for larger packages.

Sulphate of Ammonia.—There is very little offering, and holders are trying to squeeze buyers, and for prompt delivery fancy prices are asked—£12 17s. 6d. to £13 per ton, for good grey, 24% in double bags, less 2½% f. o. b. Liverpool being nominal range. These fancy prices, however, are tending to curtail business, as no buyers will fill orders unless absolutely compelled to do so.

Nitrate of soda, owing to fresh arrivals, is a shade weaker and £11 per ton, less 2½% for double bags, f. o. b. here, may be called nearest spot value.

Carb. Ammonia.—Lump, 3d. per lb.; powdered 3¼d. per lb. net cash.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified.

Acid—Acetic, chem. pure..........17@.19
Commercial, in bbls. and cbys...01¾@.02
Carbonic, liquefied, ⅌ ℔..........18@.25
Chromic, chem. pure, ⅌ ℔..........1.00
for hatteries..........40
Hydrobromic, dilute, U. S. P....25@.30
Hydrocyanic, U. S. P..........45@.50
Hydrofluoric..........20@.30
Alcohol—95%, ⅌ gall..........$2.30@$2.40
Absolute..........$3.80
Ammoniated..........$2.80
Alum—Lump, ⅌ cwt..........$1.75@$1.85
Ground, ⅌ cwt..........$1.85@$1.90
Powdered, ⅌ ℔..........04½@.05
Lump ⅌ ton, Liverpool..........£5
Aluminum Chloride—Pure, ⅌ ℔..$1.25
Amalgamating solution, ⅌ ℔..........60
Sulphate, ⅌ cwt..........$1.90@$2.50
Ammonia—Sal., in bbl. lots, ⅌ ℔..........07½@.08
Carbonate, ⅌ ℔., English and German, .07½@.08
Muriate, white, in bbls., ⅌ ℔..........08½
Aqua Ammonia—(in cbys)18°⅌℔.03@.04
20°, ⅌ ℔..........04@.05
26°, ⅌ ℔..........04¾@.05
Antimony—Oxymur, ⅌ ℔..........04@.06
Regulus, ⅌ ℔..........10@.11½
Argols—Red, powdered, ⅌ lb..........15
Arsenic—White, powdered ⅌ ℔.03@.03¾
Red ⅌ ℔..........065@.07
Yellow..........08@.09
White at Plymouth, ⅌ ton..........£12 2 6
Asbestos—Canadian, ⅌ ton.....$50@$300
Italian, ⅌ ton, c. i. f. L'pool....£18@£60
Ashes—Pot, 1st sorts, ⅌ ℔..........4.75@5
Pearl..........05¾@.06¼
Asphaltum—
Prime Cuban, ⅌ ℔..........04@.05
Hard Cuban, ⅌ ton..........$28.00@$30.00
Trinidad, refined, ⅌ ton...$30.00@$35.00
Egyptian and Syrian, ⅌ ℔.......05@.07¼
Californian, at mine, ⅌ ton$12.00@$26.00
at San Francisco,⅌ ton.$15.00@$29.00
Barium—Carbonate, pure, ⅌ ℔..........45
Carbonate, commercial, ⅌ ℔.....05@.10
Chlorate, crystal, ⅌ ℔..........75
Chloride, commercial, ⅌ ℔.......05@.10
pure, ⅌ ℔..........16
Iodide, ⅌ oz..........40
Nitrate, ⅌ ℔..........06½@.07
Sulph., Am. prime white, ⅌ ton$17.50@$19
Sulph., foreign, floated, ⅌ton......$21@$24
Sulph., off color, ⅌ ton.....$11.50@$15 00
Carb., lump, f. o. b. L'pool, ⅌ ton.....£6
No. 1, Casks, Runcorn, " " .. £4 10 0
No. 2, bags, Runcorn, " " .. £3 15 0
Bauxite—⅌ ton..........$10.00
Bichromate of Potash—Scotch, ⅌ ℔..........11@.12
American, ⅌ ℔..........11@.12
Bichromate of Soda—⅌ ℔....09½@.10
Borax—Refined, ⅌ ℔., in car lots.08@.09
San Francisco..........08@.08½
Concentrated, in car lots.......07½@.08
Refined, Liverpool ⅌ ton....... £2

Bromine—⅌ ℔..........25@.35
Cadmium Minion—⅌ lb..........$2.00
Cadmium Iodide—⅌ lb..........$5.50
Chalk—⅌ ton..........$1.50@$2.25
Precipitated, ⅌ ℔..........04@.06
China Clay—English, ⅌ ton..$13@$18.00
Domestic, ⅌ ton..........$9@$11
Chlorine Water—⅌ ℔..........10
Chrome Yellow—⅌ ℔..........10@.25
Chrome Iron Ore—⅌ ton, San Francisco..........$10.00
Chromaium—Pure, ⅌ lb..........35@.40
Commercial, ⅌ lb..........02½
Cobalt—Oxide, ⅌ ℔..........$1.60@$1.70
Copper—Sulph. English Wks. ton£20@£21
Vitriol (blue), ordinary, ⅌ ℔. 03¼@.03¾
" extra..........04½
Nitrate, ⅌ ℔..........40
Copperas—Common, ⅌ 100 lbs...85@.95
Best, ⅌ 100 lbs..........$1.35@$1.50
Liverpool, ⅌ ton, in casks....£2@£2 10s.
Corundum—Powdered, ⅌ ℔...04½@.09
Flour, ⅌ lb..........03
Cryolite—Pow., ⅌ ℔., bbl. lots....07@.08
Emery—Grain, ⅌ ℔. (⅌ kg.)....04½@.05
Flour, ⅌ ℔..........02½@.04
Epsom Salt—⅌ ℔..........01@.01⅛
Feldspar—Ground, ⅌ ton..$6.00@$10.00
Crude..........$2.00@$3 00
Fluorspar—Powdrd, No.1, ⅌ ton.$20@$30
Lump, at mine..........$6@$8
French Chalk—
Fuller's Earth—Lump, ⅌ ton. $16@$20
Glauber's Salt—in bbls., ⅌ ℔...01@.01¼
Glass—Ground, ⅌ ℔..........09@.10
Gold—Chloride, pure, crystals, ⅌ oz. $12.00
pure, 15 gr., c. v., ⅌ doz. $5.40
liquid, 15 gr., g. s. v., ⅌ doz..........$5.50
Chloride and sodium, ⅌ oz..........$6.00
15 gr., c. v., ⅌ doz. $2.75
Oxide, ⅌ oz..........$27.25
Gypsum—Calcined, ⅌ bbl... $1.25@$1.50
Land Plaster..........
Iodine—Resublimed, ⅌ oz..........30@33
Iridium—Oxide ⅌ ℔..........$90
Iron—Nitrate, 40°, ⅌ ℔..........01@.01½
47°, ⅌ ℔..........02@.02½
Kaolin—*See China Clay.*
Kieserite—⅌ ton..........$9@$10
Lead—Red, American, ⅌ ℔...06¾@.07½
White, American, in oil, ⅌ ℔. .06½@.07½
White, English, ⅌ ℔., in oil...08½@.08¾
Acetate, or sugar of, white....06@.06½
Granulated..........
Nitrate..........09@.12
Lime Acetate—Am. Brown.......90@.95
" Gray. $1.75@$1.87½
Litharge—Powdered, ⅌ ℔...05½@.07½
English flake, ⅌ ℔..........06@.09½
Magnesite—Crude, ⅌ ton of 1,015 kilos..........$14.75
Calcined, ⅌ ton of 2,240 lbs.........$22.00
Brick, ⅌ ton of 2,240 lbs..........$47.50
Manganese—Ore, per unit..........23@.28
Oxide, ground, ⅌ ℔..........02½@.06½
Mercuric Chloride—(*Corrosive Sublimate*) ⅌ ℔..........62@.64
Powdered, ⅌ ℔.......... 5

Marble Dust—⅌ bbl..........$1.25@$1.50
Metallic Paint—Brown ⅌ ton. $20@$25
Red..........$20@$25
Mineral Wool—Ordinary slag...01½
Ordinary rock..........02½
Ground, ⅌ ton..........
Mica—In sheets according to size.
1st quality, ⅌ ℔..........25@$6.0
Naphtha—Black..........
Nitre Cake—⅌ ton..........$10.0
Ochre—Rochelle, ⅌ ℔..........01¼@$01¾
Washed Nat Oxf'rd, Lump, ⅌℔.06½@.06¾
Washed Nat Oxf'rd, Powder, ⅌℔.07@.07¼
Golden, ⅌ ℔..........03@.05
Domestic, ⅌ ton..........$12@$20
Oils, Mineral—
Cylinder, light filtered, ⅌ gal...14@.16
Dark filtered, ⅌ gal....10@.13
Extra cold test, ⅌ gal. .20@.24
Dark steam refined, ⅌ gal., .07½@.12
Phosphorus—⅌ ℔..........50@.55
Precip., red, ⅌ ℔..........80@.85
white, ⅌ ℔..........85@.90
Platinic Chloride—Dry, ⅌ oz.... $7
Plumbago—Ceylon, ⅌ ℔..........04@.05
American, ⅌ ℔..........05@.07
Potassium—Cyanide, ⅌ lb., C. P. .70
67%, ⅌ ℔... .45
fused .... .38@.40
Bromide, domestic, ⅌ lb..........28@.32
Chlorate, English, ⅌ lb..........18@.18¼
Chlorate, powdered, English, ⅌ ℔.. .18½@.19
Carbonate, ⅌ lb., by casks, 82% .04½@.05
Caustic, ⅌ lb., pure slick......05½@.06
Iodide, ⅌ ℔..........$2.58@$2.80
Nitrate, refined, ⅌ lb..........06@.08
Bichromate, ⅌ lb..........10@.11½
Yellow Prussiate, ⅌ ℔.......21½@.22½
Red Prussiate, ⅌ ℔..........39@.43
Pumice Stone—Select lumps, ℔03½@.15
Original cks., ⅌ ℔..........01½@.02
Powdered, pure, ⅌ ℔.........01½@.01¾
Pyrites—Non-cupreous, p. units. .12@.13
Quartz—Ground, ⅌ ton.....$6.00@$10.00
Rotten Stone, Powdered, ⅌ ℔. 03¼@.03½
Lump, ⅌ ℔..........06@.07
Original cks, ⅌ ℔..........04½@.05¼
Rubbing stone, ⅌ ℔..........03½@.04
Sal Ammoniac—lump, in bbls., ⅌ ℔. 80¼
Salt—Liverpool, ground, ⅌ sack.... .70
Domestic, fine, ⅌ ton..........$7@$7.5
Common, fine, ⅌ ton..........$4.50@$5
Turk's Island, ⅌ bush..........26@.28
Salt Cake—⅌ ton..........$10 00@$15.00
Saltpeter—Crude, ⅌ ℔..........03¼@.04
Soapstone—Ground, ⅌ ton...... $5@$
Block and slab according to size.
Sodium—Prussiate, ⅌ ℔..........22@.24
Phosphate, ⅌ ℔..........04@.05
Stannate, ⅌ ℔..........06@.12
Tungstate, ⅌ ℔..........30@.35
Hyposulphite, ⅌ cwt., in casks $1.70@$1.80
Strontium—Nitrate, ⅌ ℔..........08½@.09
Sulphur—Roll, ⅌ ℔..........01½@.01¾
Flour, ⅌ ℔..........01¾@.02
Sylvinit, 27@35%, S.O.P., per unit. 4.3.7@½

Talc—Ground French, ⅌ ℔....01¼@.01½
American No. 1, ⅌ ℔..........01¼@.01½
American No 2..........006
Terra Alba—French, ⅌ ℔..........65@.80
English, ⅌ ℔..........65@.80
American, No. 1, ⅌ ℔..........60@.80
American, No. 2, ⅌ ℔..........40@.40
Tin—Crystals, in kegs or bbls.....14@.15
feathered or flossed. .20
Muriate, single..........07@.12
Double or strong, 54° B..........10@.15
Oxymur, or nitro..........19
Vermilion—Imp. English, ⅌ ℔. .80
Am. quicksilver, bulk..........57@.59
Am. quicksilver, bags..........58@.60
Chinese..........85@$1.00
Trieste..........90@.95
American..........11½@.12
Zinc White—Am., Dry, ⅌ ℔.. 04½@.05
Antwerp, Red Seal, ⅌ ℔.......06¼@.07
Paris, Red Seal, ⅌ ℔..........07⅝@.08
Muriate solution..........06
Sulphate crystals, in bbls., ⅌ ℔. 03@.03½

THE RARER METALS.

Aluminum—⅌ lb..........80@.85
Arsenic—(Metallic), per lb.......... .40
Barium—(Metallic), per gram.... $4.00
Bismuth—(Metallic), per lb....... $2.00
Cadmium—(Metallic), per lb.. $1@$1.50
Calcium—(Metallic), per gram....$10.00
Cerium—(Metallic), per gram...... $7.50
Chromium—(Metallic), per gram. $1.00
Cobalt—(Metallic), per lb.......... $6.00
Didymium—(Metallic), per gram. $9.00
Erbium—(Metallic), per gram..... $7.50
Gallium—(Metallic), per gram...$140.00
Glucinum—(Metallic), per gram..$12.00
Indium—(Metallic), per gram..... $9.00
Iridium—(Fused), per oz..........$12.00
Lanthanum—(Metallic), per gr..$10.00
Lithium—(Metallic), per gram....$10.00
Magnesium—(Powdered), per lb. $4.00
Manganese—(Metallic), per lb..... $1.10
Chem. pure, per oz.$10.00
Molybdenum—(Metallic), per gm .60
Niobium—(Metallic), per gram... $5.00
Osmium—(Metallic), per oz.......$65.00
Palladium—(Metallic), per oz....$20.00
Platinum—(Plate), per oz.......... $9.75
Potassium—(Metallic), per lb.....$28.00
Rhodium—(Metallic), per gram.. $5.00
Ruthenium—(Metallic), per gm.. $5.50
Rubidium—(Metallic), per gram. $2.00
Selenium—(Metallic), per oz...... $1.80
Sodium—(Metallic), per lb........50@.75
Strontium—(Metallic), per gm.... .60
Tantalium—(Metallic), per gram. $9.00
Telurium—(Metallic), per lb...... $5.00
Thallium—(Metallic), per gram.. .20
Titanium—(Metallic), per gram.. $2.20
Thorium—(Metallic), per gram...$17.00
Tungsten—(Metallic), per lb....... .80
Uranium—(Oxide), per lb......... $5.00
Metallic, per gm...... .90
Vanadium—(Metallic), per gm...$32.00
Yttrium—(Metallic), per gram.... $9.00
Zirconium—(Metallic), per oz.... $6.00

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

Name and Location of Company.	April 22. H.	April 22. L.	April 24. H.	April 24. L.	April 25. H.	April 25. L.	April 26. H.	April 26. L.	April 27. H.	April 27. L.	April 28. H.	April 28. L.	Sales.
Adams, Colo													
Alice, Mont													
Amador, Cal													
Atlantic, Mich													
Belcher, Nev	1.35				1.45								75
Belle Isle, Nev.													
Bodie Cons., Cal													
Bos. & Mont., Mont													
Breece, Colo													
Bulwer, Cal													
Caledonia, S. Dak													
Catalpa, Colo													
Chrysolite, Colo													
Colorado Central, Colo													
Commonwealth, Nev													
Comstock T. bonds, Nev.													
" scrip., Nev													
Cons. Cal. & Va., Nev	2.75		2.75		2.95								200
Crown Point, Nev			1.05								1.10		300
Deadwood, Dak													
Enterprise													
Eureka, Cons., Nev													
Father de Smet, Dak													
Freeland, Colo													
Gould & Curry, Nev			.90										200
Grand Prize, Nev													
Hale & Norcross, Nev							1.30						100
Homestake, Dak													
Horn-Silver, Utah													
Independence, Nev													
Iron Hill, Dak													
Iron Silver, Colo													
Leadville Cons., Colo	.18										.17		900
Little Chief, Colo													
Martin White, Nev													
Mono													
Mt. Diablo, Nev													
Navajo, Nev													
N. Belle Isle, Nev													
Ontario, Utah			18.00										200
Ophir, Nev.	2.85						2.85				2.85		250
Overman, Nev.													
Plymouth, Cal													
Quicksilver, Pref., Cal													
" Com., Cal													
Quincy, Mich													
Robinson Cons., Colo													
Savage, Nev	1.35				1.30								100
Sierra Nevada, Nev			1.50								1.50		200
Silver Cord, Colo													
Silver King, Ariz													
Silver Min. of L. Valley													
Small Hopes, Colo													
Standard Cons., Cal	1.45	1.40											600
Yellow Jacket, Nev							1.00				1.35		110

NON-DIVIDEND-PAYING MINES.

Name and Location of Company.	April 22. H.	April 22. L.	April 24. H.	April 24. L.	April 25. H.	April 25. L.	April 26. H.	April 26. L.	April 27. H.	April 27. L.	April 28. H.	April 28. L.	Sales
Alpha., Nev													
Alta, Nev													
American Flag, Colo													
Andes, Cal	.55												
Astoria, Cal													200
Augusta, Ga													
" bonds													
Barcelona, Nev													
Belmont, Cal													
Best & Belcher, Nev			1.85		1.85		1.35				1.70		
Bonanza King, Cal.													260
Brunswick, Cal					.10								
Bullion, Nev	.70	.65											300
Butte & Bost., Mont													300
Castle Creek, Idaho													
Chollar			.85										
Comstock T., Nev	.10				.10		09				.10		100
Con. Imperial, Nev	.10												4,000
Con. Pacific, Cal													500
Crescent, Colo													
Del Monte, Nev													
El Cristo, Rep. of Col	.40												
Emmett, Colo													100
Exchequer, Nev	.30												
Independence, Nev													500
Julia, Nev													
Justice, Nev													
Kentuck, Nev													
Lacrosse, Colo					.30		.01				.04		
Lee Basin, Colo													1,500
Mexican, Nev	1.85		1.85		1.85		1.90						
Minnesota Iron													425
Monitor, Colo													
Monte Cristo, N. S. of C.	3.15		3.15		3.15		3.15				3.15		
Nevada Queen, Nev													800
N. Standard, Cal													
N. Commonwealth, Nev.													
Occidental, Nev													
Oriental & Miller, Nev													
Phœnix Lead, Colo													
Phœnix of Ariz			.12		.13		12				.13		
Potosi, Nev			2.40				2.55						2,500
Rappahannock, Va													200
S. Sebastian, S. Sal													
Santiago													
Scorpion, Nev	15												
Seg. Belcher, Nev													200
Shoshone, Idaho													
Silver Hill, Nev													
Sullivan Con., Dak													
Sutro Tunnel, Nev													
Syndicate, Cal													
Tornado Con., Nev													
Union Cons., Nev	.10												
Utah, Nev							.30						300 200

Ex-dividend. + Dealt at in New York Stock Ex. Unlisted securities. ‡ Assessment paid. § Assessment unpaid. Dividend shares sold, 3,235 Non-dividend shares sold, 12,385.
Total shares sold, 15,620.

BOSTON MINING STOCK QUOTATIONS.

Name of Company.	Apr. 21.		Apr. 22.		Apr. 24		Apr. 25.		Apr. 26.		Apr. 27.		Sales.
Atlantic, Mich									9.70				5
Bodie, Cal													
Bonanza Development													
Bost. & Mont., Mont	25.00	24.25	25.50	25.28	25.13	24.50	25.38	25.00	25.00				2,137
Breece, Colo													
Calumet & Hecla, Mich	300	295	295		296	294	297½	295	297½	295			421
Catalpa, Colo													
Central, Mich													
Cœur d'Alene, Id													
Con. Cal. & Va., Nev													
Dunkin, Colo													
Eureka, Nev													
Franklin, Mich					12.00		12.25		13.00	12.25			285
Honorine, Utah													
Horn Silver, Utah													
Kearsarge, Mich	8.50		8.00		8.00	7.00	7.00		7.13	6.50			2,170
Lake Superior, Iron							30.00						5
Little Pittsburg, Colo													
Minnesota Iron, Minn													
Napa, Cal													
Ontario, Utah													
Osceola, Mich	32.00						32.00		31.50				9
Quincy, Mich			120		120								46
Ridge, Mich													
Sierra Nevada, Nev													
Silver King, Ariz													
Stormont, Utah													
Tamarack, Mich	160	156	159	156	155½				156				93
Tecumseh, Mich													

Name of Company.	Apr. 21.		Apr. 22.		Apr. 24		Apr. 25.		Apr. 26.		Apr. 27.		Sales
Allouez, Mich													
Arnold, Mich									.50				
Aztec, Mich													100
Brunswick, Cal													
Butte & Boston, Mont			9.00							8.88			150
Centennial, Mich					9.25	9.13	9.50	8.50	9.75	9.59			1,493
Colchis, N. Mex													
Copper Falls, Mich			7.00		7.38								250
Crescent, Colo													
Dana, Mich													
Don Enrique, Mex													
Geyser, Colo													
Hanover, Mich													
Humboldt, Mich													
Hungarian, Mich													
Huron, Mich													
Mesnard, Mich													
National, Mich					1.00				1.00				175
Native, Mich													
Oriental & M., Nev													
Phœnix, Ariz													
Pontiac, Mich													
Rappahannock, Va													
Santa Fe, N. Mex													
Shoshone, Idaho													
South Side, Mich													
Tamarack, Jr., Mich					19.75								150
Washington, Mich													
Wolverine, Mich.	2.50		2.50		2.63	2.50			2.50				700

Dividend shares sold, 5,141. Non-dividend shares sold, 3,020. Total shares sold, 8,161.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and amount of last			Dividends. Total paid.	Date & amount of last.		
1	Adams, s. l. c.	Colo..	$1,500,000	150,000	$10	*				$637,500	Jan..	1892	.05
2	Alaska-Treadwell, g.	Al'ska	5,000,000	200,000	25					1,450,000	Oct.	1892	.37½
3	Alice, s.	Mont.	10,000,000	400,000	25	*				975,000	Nov..	1891	.06¼
4	Alma & Nel Wood., g	Idaho	300,000	30,000	10	*				60,000	Jan.	1889	.50
5	Amador, g	Cal.	1,250,000	250,000	5	*				31,250	Aug..	1890	.12½
6	American, g	Colo..	3,000,000	300,000	10	*				225,000	Mar..	1892	.05
7	American Belle, s.g.c	Colo.	2,000,000	400,000	5	*				50,000	April	1891	.12½
8	Americ'n&Nettie, g.s	Colo..		300,000						175,000	Mar..	1892	.05
9	Atlantic, c	Mich.	1,000,000	40,000	25	280,000	April	1875	$1.00	700,000	Feb..	1891	1.00
10	Argenta, s	Nev..	10,000,000	100,000	100	335,000	July.	1889	.10	40,000	Feb..	1880	.20
11	Argyle, g	Colo..	1,000,000	1,000,000	1	*				20,000	Mar.	1892	.01
12	Aspen Mg. & S., s. l.	Colo..	2,000,000	200,000	10	*				760,000	Sept.	1892	.10
13	Aurora, i	Mich..	2,500,000	100,000	25					650,000	Feb..	1893	2.00
14	Badger, s	Ont...	250,000	50,000	5					37,500	Mar.	1890	.25
15	Bald Butte	Mont	250,000	250,000	1	*				72,500	Mar..	1892	.03
16	Bates Hunter, s. g.	Colo..	1,000,000	1,000,000	1						Dec..	1891	.00¾
17	Belle Isle, s	Nev..	10,000,000	100,000	100	220 00	Aug.	1892	.10	300,000	Dec..	1879	.25
18	Belcher, s. g.	Nev..	10,400,000	104,000	100	3,16 00	May	1892	.25	15,397,000	April	1876	1.00
19	Bellevue, Idaho, s. l.	Idaho	1,250,000	125,000	10	1. 000	Dec..	1889	.25	200,000	Jan..	1890	.10
20	Best Friend	Colo.	1,000,000	1,000,000	1					90,000	Feb..	1892	.01
21	Bi-Metallic, s. g	Mont.	5,000,000	200,000	25					2,220,000	Feb..	1893	.20
22	Bodie Con., g. l	Cal...	10,000,000	100,000	100	0,000	June	1890	.25	1,602,572	April	1885	.50
23	Boston & Mont., g	Mont.	2,500,000	250,000	10	*				520,000	June	1886	.15
24	Boston & Mont., c. s.	Mont.	3,125,000	125,000	25	*				2,075,000	Nov..	1891	1.00
25	Brooklyn Lead, l. s.	Utah.	500,000	50,000	10					127,000	July.	1887	.05
26	Brotherton, i	Mich.	2,000,000	80,000	25	*				120,000	Mar..	1893	.50
27	Bulwer, g	Cal...	10,000,000	100,000	10	30,000	Aug..	1889	.25	190,000	Oct..	1892	.05⅜
28	Bunker Hill & S. s. l.	Idaho	3,000,000	300,000	10	*				150,000	Oct..	1888	.06
29	Caledonia, g	Dak..	10,000,000	100,000	100	505,000	May.	1885	.15	192,000	Oct..	1890	.08½
30	Calliope, s	Colo..	1,000,000	1,000,000						140,000	Jan..	1891	.00
31	Calumet & Hecla c	Mich..	2,500,000	100,000	25	1,200,000				38,850,000	Dec.	1892	5.00
32	Centen'l-Eureka, s.l.	Utah.	1,500,000	30,000	50					607,500	Feb.	1893	.50
33	Central, c	Mich..	500,000	20,000	25	100,000	Oct..	1861	.65	1,970,000	Feb..	1891	1.00
34	Champion, g	Cali	340,000	34,000	10					129,500	April	1893	.10
35	Chrysolite, s. l.	Colo..	10,000,000	200,000	50	*				1,650,000	Dec..	1884	.25
36	Clay County, g	Colo..	200,000	200,000	1	*				56,000	Nov..	1891	.02
37	Clinton Con, g	Cal...	5,000,000	100,000	5					90,000	Nov..	1891	.10
38	Cœur D'Alene, s. l.	Idaho	5,000,000	500,000	10					310,000	Nov..	1891	.02
39	Colorado Central, s.l.	Colo..	2,750,000	275,000	10	*				502,500	Jan..	1892	.05
40	Commonwealth, s.	Nev..	10,000,000	100,000	100	190,000	Sept.	1892	.10	20,000	Nov..	1890	.20
41	Confidence, s. l.	Nev...	2,496,000	24,960	100	1,589,550	Aug..	1892	.50	199,680	April	1889	1.00
42	Cons. Cal. & Va., s.g	Nev...	21,600,000	216,000	100	108,000	Jan..	1885	.20	3,682,800	Aug.	1891	.50
43	Contention, s.	Ariz..	12,500,000	250,000	50					2,637,500	Aug.	1892	.20
44	Cook's Peak, s	N. M.	2,000,000	200,000	10					114,532	Nov.	1892	.05
45	**Cop. Queen Con., c.	Ariz..	2,000,000	200,000	10					1,360,000	Feb.	1893	.50
46	Coptis	Nev..	10,000,000	100,000	100					67,000	July..	1892	.12
47	Cortez, s	Nev.	1,500,000	500,000	05					687,000	Mar..	1892	.50
48	Crescent, s. l. g	Utah.	15,000,000	600,000	25	60,000	Oct.	1892	.10	238,000	Oct..	1888	.03
49	Crown Point, g. s.	Nev...	10,000,000	100,000	100	2,700,000	Sept.	1892	.25	11,898,000	Jan..	1875	2.00
50	Cumberland, l. s.	Mont.	5,000,000	500,000	10	*				15,000	Nov.	1889	.03
51	Daly, s. l.	Utah.	3,000,000	150,000	20					2,762,500	April	1893	.25
52	Deer Creek, s. g.	Idaho	1,000,000	200,000	5	*				20,000	June	1889	.05
53	Deadwood-Terra, g.	Dak..	5,000,000	200,000	25	*				1,150,000	Oct.	189?	.05
54	De Lamar, s. g	Idaho	2,000,000	400,000	5					800,000	April	1893	.37½

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		apital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and am't of last.		
1	Alliance, s. g	Utah.	$100,000	100,000	$1	$120,000	Feb..	1891	.20
2	Allouez, c	Mich.	2,000,000	80,000	25	737,000	Jan..	1890	.7
3	Alpha Con., g. s	Nev..	3,000,000	30,000	100	209,000	Sept.	1892	.10
4	Alta, s	Nev..	10,080,000	100,800	100	3,369,880	Jan.	1892	.1
5	American, c	Idaho	5,000,000	500,000	100				
6	American Flag, s	Colo..	1,250,000	125,000	1	300,000	June	1887	
7	Amity, s	Colo..	250,000	250,000	20				
8	Anchor, s. l. g	Utah.	3,000,000	150,000	5	410,000	June	1890	.20
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	125				
10	Appalachian, g	N. C.	1,750,000	1,400,000	20				
11	Arizona, c	Ariz..	3,575,000	160,000	2				
12	Astoria, g	Cal..	200,000	100,000	5				
13	Atlanta, g. s	Idaho	3,250,000	650,000	25				
14	Barcelona, g	Nev..	5,000,000	200,000	5	*			
15	Bear Creek	Idaho	100,000	20,000	1				
16	Belmont, g	Cal..	500,000	500,000	100	*			
17	Belmont, s	Nev..	5,000,000	50,000	100	735,000	April	1886	.10
18	Best & Belcher, s. g.	Nev..	10,080,000	100,800	10	2,405,275	Aug..	1892	.25
19	Black Oak, g	Cal...	3,000,000	300,000	100	*			
20	Boston Con., g	Cal...	10,000,000	100,000	1	170,000	Nov..	1888	.25
21	Brownlow, g	Colo..	250,000	250,000	5				
22	Brunswick, g	Cal..	2,000,000	400,000	2				
23	Buckeye, s. l	Mont.	1,000,000	500,000	100				
24	Bullion, s. g	Nev.	10,000,000	100,000	100	2,890,000	Aug.	1892	.25
25	Burlington, g. s	Cal...	10,000,000	100,000					
26	Butte & Boston, c. s.	Mont.	5,000,000	200,000	10				
27	Butte Queen, g	Cal...	1,000,000	100,000	1	6,000	Jan..	1892	.04
28	Calaveras, g	Cal...	500,000	500,000	5				
29	Calaveras Con., g	Cal...	800,000	160,000	10				
30	California, g	Cal...	1,000,000	100,000	5	9,000	Mar.	1892	.03
31	California Con. l. q.	Cal....	2,250,000	450,000	10				
32	Camille, g	Ga	1,500,000	150,000	5				
33	Carisa, g	Wy..	500,000	100,000	2	*			
34	Carupano, g. s. l. c.	Ven...	200,000	100,000	2	*			
35	Cashier, g. s	Colo..	500,000	250,000	100	*			
36	Challenge Con., g. s.	Nev..	5,000,000	50,000	10				
37	Cherokee, g	Cal...	1,500,000	150,000	100				
38	Chollar, s. g	Nev..	11,200,000	112,000	2	1,820,000	May..	1892	.50
39	Cleveland, t	Dak..	1,000,000	500,000	10	*			
40	Colchis, s. g	N. M..	500,000	150,000	5				
41	Colorado, s	Colo..	1,625,000	325,000	1				
42	Comstock, s	Utah.	1,250,000	250,000	100				
43	Comstock Tun.	Nev..	10,000,000	100,000	100	35,000	Mar.	1887	.15
44	Con. Imperial, g. s	Nev..	5,000,000	50,000	50	2,062,500	Jan..	1892	.25
45	Con. New York, s. g.	Nev..	5,000,000	100,000	100	110,000	Mar..	1892	.10
46	Con. Pacific, g	Cal..	6,000,000	60,000	10	198,000	June	1890	10
47	Con. Silver, s	Mo....	2,500,000	250,000	5				
48	Cordova Union, g	Cal....	1,000,000	200,000	10				
49	Crescent, s. l	Colo..	8,000,000	300,000	100	*			
50	Crocker, s	Ariz..	10,000,000	100,000	1	165,000	Aug.	1892	.05
51	Crowell, g	N. C..	500,000	500,000	1				
52	Dahlonega, g	Ga.	250,000	250,000	10	*			
53	Dandy, s	Colo..	5,000,000	500,000					
54	Decatur s	Colo.	1,500,000	300,000					

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total Levied	Date and amount of last.			Dividends. Total paid.	Date & amount of last.		
55	Derbee B. Grav., G	Cal.	[illegible]	[illegible]	[illegible]	[illegible]	Sept.	[illegible]	.10	[illegible]	Aug..	[illegible]	[illegible]
56	Dexter, g. s	Nev..	1,000,000	100,000	10					80,000	Aug..	1892	.25
57	Dunkin, s. L.	Colo..	5,000,000	200,000	25	*				390,000	Oct..	1889	.05
5	Elkhorn, s. L.	Mont.	1,000,000	200,000	5	*				973,045	Mar	1893	.10
59	Enterprise, s.	Colo..	2,500,000	500,000	5	*				825,000	April	1893	.05
60	Eureka Con., s. L.. G.	Nev...	1,000,000	50,000	100	550,000	June	1889	.50	5,017,500	Jan	1892	.25
61	Evening Star, s. L.	Colo..	500,000	50,000	10	*				1,450,000	Dec.	1889	.2
62	Father de Smet, G	Dak..	10,000,000	100,000	100	200,000	Nov..	1878	1.00	1,125,000	Dec..	1885	.20
63	Franklin, C.	Mich..	1,000,000	40,000	25	220,000	June	1871		1,100,000	July	1892	2.00
64	Freeland, s. G	Colo..	5,000,000	200,000	25	*				190,000	July.	1886	.10
65	Garfield Lt., G. s	Nev..	500,000	100,000	5					90,000	April	1888	.12½
66	Glengarry	Mont.	1,000,000	100,000	10					10,000	June	1891	.10
67	Gold Rock	Colo..	500,000	500,000	1						Dec.	1891	.01
68	Golden Reward	S.Dak	1,250,000	250,000	5					85,000	April	1893	.02
69	Gould & Curry, s. G..	Nev...	10,800,000	108,000	100	4,591,200	June	1892	.25	3,826,800	Oct..	1870	10.00
70	Grand Prize, s	Nev...	10,000,000	100,000	100	785,000	Jan..	1890	.30	495,000	Mar.	1884	.25
71	Granite, s. L	Idaho	500,000	500,000	1	*				83,400	Nov..	1890	.02
72	Granite Mountain, s.	Mont.	10,000,000	400,000	25					12,120,000	July.	1892	.20
73	Great Western, L. Q..	Cal...	5,000,000	50,000	100					394,861	Dec.	1892	.25
74	Green Mountain, G..	Cal...	1,250,000	125,000	10	*				212,000	Nov..	1881	.07½
75	Hale & Norcross, G. s.	Nev...	11,200,000	112,000	100	5,534,800	Aug.	1892	.50	1,822,000	Aug.	1888	.50
76	Hecla Con., s. G. L. C.	Mont.	1,500,000	30,000	50					1,980,000	April	1893	.50
77	Hel'a Mg. & Red, s.L.G.	Mont.	3,315,000	663,000	5	*				197,970	July.	1886	.06
78	Helena & Frisco, s.L.	Idaho	2,500,000	500,000	5					170,000	July..	1891	.02
79	Helena & Victor	Mont.	1,000,000	200,000	5					80,000	May..	1892	.05
80	***Holmes, s.	Nev...	10,000,000	100,000	100	370,000	May.	1890	.25	75,000	April	1886	.25
81	Homestake, G	Dak..	12,500,000	125,000	100	200,000	July.	1878	1.00	4,978,750	April	1893	.10
82	Honorine, s. L	Utah.	500,000	250,000	2	37,500	April	1889	.05	125,000	Sept.	1887	.05
83	Hope, s	Mont.	1,000,000	100,000	10	*				458,252	May	1893	.25
84	Horn-Silver, s. L	Utah.	10,000,000	400,000	25	*				4,700,000	Mar.	1893	.12½
85	Hubert, G	Colo..	1,000,000	1,000,000	1	*				247,000	Dec.	1889	.00½
86	Idaho, G	Cal...	310,000	3,100	100					5,419,250	Dec.	1892	2.50
87	Illinois, s	N. M..	100,000	100,000	1	*				45,000	April	1889	.20
88	Iron Hill, s	Dak..	2,500,000	250,000	10	134,000	July.	1889	.03	156,250	Nov.	1887	.07½
89	Iron Mountain, s	Mont.	5,000,000	500,000	10	*				215,000	Aug.	1892	.03
90	Iron-Silver, s. L	Colo..	10,000,000	500,000	20	*				2,500,000	April	1889	.20
91	Jack Rabbit, G	Cal...	10,000,000	100,000	100	100,000	Sept.	1892	.10	260,000	Aug	1891	.10
92	Jackson, G. s	Nev..	5,000,000	50,000	100	237,500	Nov..	1880	.20	60,000	Jan.	1891	.10
93	Kearsarge, C	Mich..	1,000,000	40,000	25	190,000	Oct..	1887	1.00	80,000	Jan.	1890	2.00
94	Kennedy	Cal...	10,000,000	100,000	100					387,000	May..	1892	.15
95	Kentuck, s. G	Nev..	3,000,000	30,000	100	454,180	Oct..	1891	.15	1,350,000	Dec.	1886	.10
96	La Plata, s. L	Colo..	2,000,000	200,000	10	*				610,000	Sept.	1882	.30
97	Leadville Con., s. L..	Colo..	4,000,000	400,000	10	*				316,500	Feb..	1892	.03
98	Lexington, G. s.	Mont.	4,000,000	40,000	100	*				609,000	Jan..	1890	2.00
99	Little Chief, s. L	Colo..	10,000,000	200,000	50	*				820,000	Dec..	1890	.05
100	Little Rule, s	Colo..	500,000	500,000	1					220,000	Dec..	1891	.02
101	Maid of Erin	Colo..	3,000,000	600,000	5					557,757	April	1892	.25
102	Mammoth, s. L. G	Utah	10,000,000	400,000	250	110,000		1882	.25	1,040,000	Dec...	1891	.10
103	Martin White, s	Nev..	10,000,000	100,000	100	1,275,000	Jan..	1892	.25	140,000	Dec..	1886	.25
104	Mary Murphy, s. G..	Colo..	350,000	3,500	101	*				175,000	May..	1888	5.00
105	Matchless, s. L	Colo..	500,000	500,000	1	*				15,000	Feb...	1890	.00½
106	Maxfield	Utah.	3,000,000	300,000	10					117,000	April	1892	.03
107	Mayflower, D. gravel	Cal..	1,000,000	100,000	10					120,000	Mar..	1893	.10
108	May Mazeppa, s. L..	Colo..	1,000,000	100,000	1	*				205,000	Oct..	1891	.03¾
109	Minas Prietas, G. s..	Mex..	1,000,000	100,000	10					350,000	Dec...	1890	.50
110	Minnesota, C	Mich..	1,000,000	40,000	25	420,000	April	1886	1.00	1,820,000	Mar	1876	
111	Mollie Gibson, s	Colo..	5,000,000	1,000,000	5					3,450,000	May..	1893	15
112	Monitor, G	S.Dak	2,500,000	250,000	10					45,000	Oct..	1890	.03
113	Mono, G	Cal..	5,000,000	50,000	100	760,000	Sept.	1890	.25	12,500	Mar	1886	.25
114	Montana, Lt., G. s	Mont.	3,300,000	660,000	5	*				2,619,075	June.	1891	12½
115	Morning Star, s. L	Colo..	1,000,000	100,000	10					925,000	April	1891	.25
116	Morning Star Drift, G	Cal..	240,000	2,400	100					111,800	Dec...	1892	3.00
117	Moulton, s. G	Mont.	2,000,000	400,000	5	*				410,000	Nov.	1892	.07½
118	Mt. Diablo, s	Nev..	5,000,000	50,000	100	137,500	June	1880	2.00	210,000	July.	1891	.20
119	Napa, Q	Cal...	700,000	100,000	7					540,000	Apr..	1893	.20
120	Navajo, G. s	Nev..	10,000,000	100,000	100	520,000	May.	1891	.20	229,950	April	1889	.10
121	Newton	Cal...	10,000,000	100,000	100					10,000	May..	1891	.05
122	New California, G	Colo..	800,000	160,000	5	*				48,800	May..	1890	.12½
123	New Guston, s	Colo..	550,000	110,000	5					1,877,500	April	1892	.75
124	North Banner Con	Cal...	1,000,000	100,000	10					20,000	July..	1891	.05
125	North Commonw'th	Nev.,	10,000,000	100,000	10					25,000	June.	1891	.25
126	N. Hoover Hill, G. s..	N. C.	300,000	120,000	2½	*				30,000	Dec..	1885	.06½
127	North Belle Isle, s..	Nev..	10,000,000	100,000	100	474,689	Nov.	1892	.10	230,000	May.	1888	.50
128	North Star, G	Cal..	1,000,000	100,000	10					400,000	Mar..	1893	.50
129	Omaha Cons., G	Cal...	2,400,000	24,000	100					30,000	May..	1892	.15
130	Ontario, s. L	Utah	15,000,000	150,000	100					13,175,000	Oct..	1892	.50
131	Ophir, G. s	Nev..	10,000,000	100,000	100	4,210,640	April	1890	.50	1,595,800	Jan..	1880	1.00
132	Original, s. G	Mont.	1,500,000	60,000	25	*				138,000	Jan..	1889	.05
133	Oro, s. L. G	Colo..	500,000	100,000	5					95,000	July	1890	.20
134	Osceola, C	Mich..	1,250,000	50,000	25	480,000	April	1876	1.60	1,747,500	May.	1893	1.00
135	Pacific Coast, B	Cal...	1,500,000	15,000	100					360,000	Dec.	1892	1.00
136	Parrot, C	Mont.	1,800,000	180,000	10					1,405,385	Dec.	1892	.10
137	Petro	Utah.	10,000,000	10,000	100					17,500	July	1891	.75
138	Plumas Eureka, G	Cal...	1,406,250	140,625	10					2,643,559	April	1892	.18
139	Plymouth Con, G	Cal...	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
140	Poorman, G. s	Idaho	375,000	300,000	125	*				68,260	Sept	1892	
141	Quicksilver, pref., Q	Cal...	4,300,000	43,000	100					1,823,911	June	1891	1.25
142	" com., Q	Cal...	5,700,000	57,000	100					643,867	July.	1882	.40
143	Quincy, C	Mich..	1,250,000	50,000	25	200,000	Dec..	1862		6,470,000	Feb.	1893	3.00
144	Red Cloud	Idaho	1,000,000	200,000	5					153,000	Dec.	1892	.10
145	Reed National, s. G..	Colo..	500,000	500,000	1	*				50,000	Dec..	1890	.01
146	Retriever, L	S.Dak	1,250,000	250,000	5					20,000	Aug..	1891	.03
147	Rialto, G	Colo..	300,000	300,000	1	*				50,250	April	1892	.01½
148	Richmond, s. L	Nev..	1,350,000	54,000	25	*				4,346,325	Aug..	1891	.25
159	Ridge, C	Mich..	500,000	20,000	25	219,939	Mar.	1886	.50	99,785	Feb..	1880	.50
150	Robinson Con., s. L..	Colo..	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
151	Running Lode, G	Colo..	1,000,000	1,000,000	1	*				36,000	May.	1892	00 1-10
152	Savage, s	Nev..	11,200,000	112,000	100	6,772,000	Feb..	1892	.50	4,460,000	June	1869	3.00
153	Sheridan, s. G	Colo..	300,000	3,000	100	*				300,000	Oct..	1891	2.50
154	Shoshone, G	Idaho	150,000	150,000	1					7,500	April	1883	.01
155	Sierra Buttes, G	Cal...	2,225,000	122,500	10					1,529,307	Oct.	1892	.18
156	Sierra Nevada, s. G..	Nev..	10,000,000	100,000	100	6,411,910	June	1892	.25	102,000	Jan..	1871	1.00
157	Sierra Nevada, s. L..	Idaho	1,000,000	1,000,000	1	*				40,000	May..	1889	.02
158	Silent Friend	Colo.	500,000	500,000	1					60,000	Aug..	1891	.02½
159	Silver Cord, s. L. G	Colo..	4,500,000	450,000	10					265,000	April	1889	.10
160	Silver King, s	Ariz..	10,000,000	100,000	100	130,000	Nov.	1890	.30	1,950,000	July	1887	.25
161	Silver Mg. of L.V., s.L.	N. M..	500,009	500,000	1					300,000	Dec..	1891	4.05
162	Slide	Colo..	500,000	5,000	100					20,000	Nov..	1891	4.00
153	Small Hopes Con., s.	Colo..	5,000,000	250,000	20	*				32,00,000	Nov..	1892	.15
164	Spring Valley, G	Cal...	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan..	1881	.25
165	Standard, G. s	Cal...	10,000,000	100,000	100	100,000	June	'89	.50	3,655,000	Mar..	1893	.10
166	Stormont, s	Utah.	500,000	500,000	1	*				155,000	Nov.	1881	.05
167	St. Joseph, L	Mo..	1,500,000	150,000	10	*				1,974,000	Dec..	1890	.02
178	Swansea, g. s	Colo..	600,000	60,000	10					27,000	Mar.	1893	.10
169	Tamarack, C	Mich..	1,250,000	50,000	25	520,000	April	'85	3.00	3,160,000	Oct..	1892	.00
170	Teal & Poe	N. M..	150,000	150,000	1					9,000	Nov.	1891	.01½
171	Tombstone, G. s. L	Ariz.	12,500,000	500,000	25	*				1,250,000	April	1882	.10
172	Trinity Riv'r Hydr., G	Colo..	500,000	500,000	1	*				7,500	April	1893	.00½
173	United Verde, C	Ariz..	3,000,000	300,000	10	*				207,500	Jan..	1892	.10
174	Victor, G	Colo..	1,000,000	200,000	5					10,000	April	1893	.05
175	Viola Lt., s. L	Idaho	750,000	150,000	5					337,500	Nov.	1888	.37½
176	Ward Con., s	Colo.	2,000,000	200,000	10					20,000	Dec.	1889	.05
177	Woodside, s. L	Utah	100,000	100,000	10					25,000	Oct..	1889	.25
178	W. Y. O. D.	Cal..	30,0,00	15,000	2	22,500	May.	1891	.10	42,000	Dec.	1892	.10
179	Yankee Girl, s	Colo.	1,300,000	250,000	5					1,405,000	April	1891	1.50
180	Yellow Jacket, G. s.	Nev.	12,000,000	120,000	100	5,808,000	Sept.	1892	.25	2,184,000	Aug.	1871	1.50
181	Yosemite No. 2	Utah.	1,000,000	100,000	10					25,000	Oct..	1891	.05
182	Young America, G	Cal.								175,000	Jan..	188[illegible]	1.10

NON DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied	Date and am't of last.		
55	Denver City, s	Colo..	5,000,000	500,00	11	*			
56	Denver Gold, G	Colo..	300,000	60,000	5				
57	Dickens-Custer, s	Idaho	2,100,000	420,000	5				
5	Durango, G	Colo..	500,000	500,000	1	*			
59	Eastern Dev. Co., Lt	N. S..	1,500,000	150,000	10	990,000	Mar.	1886	1.00
60	El Dorado, G	Cal..	1,000,000	250,000	4	*			
61	El Talento, G	U.S.C.	1,000,000	500,000	2				
62	Emma, s	Utah.	625,000	500,000	125				
63	Emmons, s. L	Colo..	2,000,000	2,000,000	1				
64	Empire, s	Utah.	10,000,000	100,000	100				
65	Eureka Tunnel, s. L.	Nev...	10,000,000	100,000	100	*			
66	Exchequer, s. G.	Nev...	10,000,000	100,000	100	940,000	Jan..	1892	.25
67	Found Treasure, G. s.	Nev...	10,000,000	100,000	100	130,500	Jan..	1892	.50
68	Gogebic I. Syn., I	Wis..	5,600,000	200,000	25				
69	Gold Bank, g. s	Colo.	250,000	250,000	1	*			
70	Gold Cup, s	Colo..	500,000	500,000	1	*			
71	Golden Era, s	Mont.	2,000,000	200,000	10	*			
72	Gold Flat, G	Cal...	1,000,000	100,000	10	5,000	Mar.,	1892	.05
73	Gold King, g	Colo..	1,650,000	350,000	5				
74	Gold Rock, G	Cal...	1,000,000	500,000	2				
75	Golden FeatherCo., g	Cal...	900,000	180,000	5				
76	Goodshaw, G	Cal...	10,000,000	100,000	100	*			
77	Goodyear G. s. L	Mont.	1,000,000	200,000	5	13,000	Feb..	1892	.01
78	Grand Belt, C	Tex..	12,000,000	120,000	100				
79	Grand Canyon, s	Ariz..	375,000	75,000	5				
80	Grand Duke, s	Colo.	800,000	80,000	10				
81	Gregory Con., G	Mont.	3,000,000	300,000	10				
82	Harlem M. & M. Co., G.	Cal...	1,000,000	200,000	5				
83	Hartery Con., G	Cal...	1,000,000	100,000	10	22,000	Oct..	1890	.05
84	Hartshorn, g s. l.	S.Dak	1,250,000	250,000	5	8,750	Sept.	1891	.00½
85	Head Cent. & Tr., s. G	Ariz..	10,000,000	100,000	100	16,981	Mar..	1892	.03
86	Hector, G	Cal...	1,500,000	300,000	5	45,000	Jan..	1889	.15
87	Highland, C	Mich..	500,000	25,000	20				
88	Himalaya, g. s l	Utah.	1,800,000	180,000	10	12,800	Oct.	1892	.00½
89	Holywood	Cal...	200,000	100,000	2				
90	Hortense, s	Colo..	2,000,000	200,000	10				
91	Huron, C	Mich..	1,000,000	40,000	25	280,000	May.	1887	3.00
92	Idaho, g. s	Idaho	1,250,000	250,000	5				
93	Inez, s. L	Idaho	1,000,000	1,000,000	1				
94	Ingalls, g	Colo..	100,000	20,000	5				
95	Ironton, I	Wis..	1,000,000	40,000	25				
96	Iroquois, C	Mich..	1,250,000	50,000	25				
97	Kentuck Con	Nev..	10,500,000	105,000	00	57,750	July.	1892	.10
98	J. D. Reymert, s	Ariz..	10,000,000	100,000	100				
99	Julia Con., G. s	Nev...	11,000,000	110,000	100	1,463,000	Jan..	1889	.10
100	Justice, g. s. c	Colo.	500,000	500,000	1	*			
101	Lacrosse, G	Colo..	1,000,000	100,000	10	*			
102	La Cumbre, g. s	Mex..	150,000	3,000	50	*			
103	Lee Basin, s	Colo..	5,000,000	500,000	10	*			
104	Little Josephine, s..	Colo..	250,000	50,000	5				
105	Lone Star Cons., G..	Cal...	500,000	500,000	1	10,000	April	1892	.00½
106	Lynx Creek, g	Ariz..	237,500	147,500	5				
107	Madeleine, G. s. L	Colo..	750,000	50,000	1	4,500	Feb.	1892	.00½
108	Mammoth Gold, G	Ariz..	2,500,000	500,000	5	*			
109	Mayflower Gravel, G.	Cal...	1,000,000	100,000	10	*			
110	Medora, G	Dak..	250,000	250,000	1	585,000	Mar.	1890	.54
111	Merrimac Con., G. s.	Colo..	5,000,000	500,000	10				
112	Mexican, G. s	Nev...	10,000,000	100,000	100	2,917,560	ct..	1892	.50
113	Michigan, g s	Mich..	2,500,000	100,000	25	40,000	Mar..	1892	
114	Middle Bar, G	Cal...	400,000	200,000	2	*			
115	Mike & Starr, s. C.	Colo..	1,000,000	200,000	5	*			
116	Milwaukee, s	Mont.	500,000	500,000	1	*			
117	Minah Cons	Mont.	1,250,000	250,000	5				
118	Modoc Chief, l. s. g.	Idaho	1,000,000	200,000	5	5,000	Jan..	1892	.00½
119	Monitor, G	Colo..	100,000	100,000	1	12,500	May.	1891	.01
120	Montreal, G. s. L	Utah.	750,000	150,000	5	4,500	Feb..	1892	.00½
121	Mountain Ledge, g..	Cal...	500,000	100,000	5				
122	Mount McClellan	Colo.	1,500,000	300,000	5				
123	Mutual Mg. & Sm	W'sh.	100,000	100,000	1	*			
124	Native, C	Mich..	1,000,000	40,000	25				
125	Neath, G	Colo..	1,000,000	100,000	10				
127	Nelson	Cal...	50,000	10,000	5				
128	Nevada Queen, s	Nev...	10,000,000	100,000	100	200,000	Oct..	1889	.25
129	New Germany, G	N. S..	100,000	100,000	1	*			
130	New Gold Hill	N. C..	1,750,000	350,000	5				
131	New Pittsburg, s. L..	Colo..	2,000,000	200,000	10	*			
132	New Queen Gold, s..	Colo..	800,000	160,000	5				
133	North Standard, G	Cal...	10,000,000	100,000	100	20,000	Nov.		
134	Occidental Con., g.s		10,000,000	100,000	100	245,000	April	1892	.25
135	Oneida Chief, G	Cal...	500,000	125,000	100	*			
136	Oriental & Miller, s..	Nev...	10,000,000	400,000	100				
137	Original Keystone, s.	Nev..	10,000,000	100,000	100	250,000	Mar..	1892	.10
138	Osceola, G	Nev...	5,000,000	500,000	10	*			
139	Overman, G. s	Nev...	11,520,000	115,200	100	4,001,840	May.	1892	.10
140	Park, s	Utah.	2,000,000	200,000	10				
141	Parker, g	N. C..	750,000	180,000					
142	Pay Rock, s	Colo..	1,000,000	200,000	5				
143	Peer, s	Ariz..	10,000,000	100,000	100	190,000	Feb..	1892	.10
144	Peerless, s	Ariz..	10,000,000	100,000	100	405,000	Oct...	1890	.15
145	Pennsylva'a Cons., G	Cal...	5,150,000	515,000	10	36,050	Feb..	1892	.10
146	Phoenix, g	Ariz..	500,000	500,000	1	*			
147	Phoenix Lead, s. L..	Colo..	100,000	100,000	1	*			
148	Pilgrim, G	Cal...	600,000	300,000	2	*			
149	**Pioche M.&R., s.G.L.	Utah.	20,000,000	2,000,000	10				
150	Poorman, Ltd., s. L.	Idaho	250,000	50,000	5				
151	Potosi, s	Nev...	11,200,000	112,000	100	1,573,000	Mar..	1890	.50
152	Proustite, s	Idaho	250,000	250,000	1	*			
153	Puritan, s. G	Colo..	1,500,000	150,000	10	*			
154	Quincy, C	Colo..	3,000,000	300,000	10				
155	Rainbow, g	S.Dak	1,250,000	250,000	5	4,250	July.	1892	.00½
156	Rappahannock, G. s.	Va....	250,000	250,000	1	*			
157	Red Elephant, s	Colo..	500,000	500,000	1	*			
158	Red Mountain, s	Colo..	300,000	60,000	5				
159	Ropes, G. s	Mich..	2,000,000	80,000	25	167,200	Feb.	1891	.50
160	Ruby & Dun., s. L. G.	Nev..	25,300	506	50				
161	Russell, G	N. C..	1,500,000	300,000	5				
162	Sampson, G. s. L	Utah.	10,000,000	100,000	100	288,15[illegible]	July.	1888	1.08
163	Seal of Nevada, g.s..	Nev..	5,000,000	100,000	50				
164	Silver Age, s l. g.	Colo..	2,000,000	200,000	10	*			
165	Silver Bell, s	Ariz..	850,000	170,000	5				
166	Silver King, s	Cal..	2,000,000	400,000	5				
167	Silver Queen, C	Ariz..	5,000,000	200,000	25	*			
168	Silverton, s	Colo..	300,000	60,000	5				
169	Siskiyou Con., L	Cal...	2,000,000	200,000	10	13,000	May..	1892	.01½
170	South Bulwer, G	Cal...	10,000,000	100,000	100	100,000	May.	1881	.25
171	South Hite, g	Cal..	10,000,000	100,000	100	195,000	Jan..	1883	.05
172	South Pacific, g	Cal..	500,000	100,000	5				
173	Stanislaus, G	Cal...	2,000,000	200,000	10				
174	St. Kevin, s. G	Colo.	100,000	100,000	1	*			
175	St. Louis & Mex., s..	Mex..	[illegible]	500,000	10	*			
176	St. Louis & St. Elmo	Colo..	[illegible]	200,000	10				
177	St. L. & St. Felipe, G.s.	Mex..	[illegible]	150,000	10				
178	St. L. & Sonora, G. s..	Ariz..	3,000,000	300,000	10	*			
179	Stemwinder, l. s	Idaho	500,000	500,000	1				
180	Sunday Lake, I	Mich..	1,250,000	50,000	25				
181	Sullivan Con., G	Dak..	600,000	200,000	3	*			
182	Sylvanite, s	Colo..	5,000,000	500,000	10	*			
183	Taylor-Plumas, G	Cal...	325,000	65,000	5	3,575	Mar..	1892	.01½
184	Telegraph, g. s	Cal...	325,000	65,000	5	3,575	Mar.	1892	.01½
185	Telegraph, G. s	Mex..	100,000	100,000	1	70,000	Feb..	1892	.10
186	Teresa, G. s	Cal...	1,000,000	200,000	5	10,000	Feb..	1888	.10
187	Tioga Con., G	Nev...	10,000,000	100,000	10	295,000	May.	1888	.25
188	Tornado Con., G. s	Nev...	100,000	100,000	1	*			
189	Tuscarora, s	Nev...	10,000,000	500,000	20	385,000	Jan.	1892	.25
190	Union Con., G. s	Nev...	10,000,000	100,000	100	370,000	June	1892	.25
191	Utah, s	Nev..	10,000,000	100,000	100	245,000	Aug..	1890	.25
192	Ute & Ulay, s. L	Colo..	1,000,000	500,000	2	1,500	Mar..	1892	.0018
193	Valley, g	Cal...	575,000	460,000	125				
194	Wall Street, G. s. L..	Colo..	500,000	500,000	1				
195	Washington, C	Mich..	1,000,000	40,000	5				
196	West Argentine, s..	Colo..	750,000	150,000	5				
197	West Granite Mt., s..	Mont.	500,000	100,000	5	*			
198	Whale, s	Mont.	5,000,000	500,000	10	*			
199	Wood River, g	Idaho	2,000,000	200,000	10	3,000	Aug.	1891	.00½
200	Yuma, C. s. G	Ariz..	10,000,000	400,000	2				
201	Zelaya, G. s	C. A..	600,000						

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. § 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 $42,390,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid $1,350,000 in dividends. ¶ This company paid $190,000 before the reorganization in 1880. ** This company acquired the property of the Raymond & Ely Company which had paid $3,075,000 in dividends. *** Previous to this company's acquiring Northern Belle, that mine declared $2,400,000 in dividends against $425,000 in assessments

COAL AND COAL RAILROAD STOCKS.

Names of Stocks.	April 22.		April 24.		April 25.		April 26.		April 27.		April 28		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Am Coal													
Balt. & Ohio													
do pref													
Buff., R., P.	33				33		33				33		1,(00
do. pref													
Cambria Iron													
Ches. & Ohio	22½	22¼	22⅞	22½	23¼	23	23¼	23⅛			23¾	23⅜	510
do. 1st pref													
do 2d pref													
Col. C. & I.					18								60
Col. Coal													
Colorado Fuel	63		63	62¼	62¾	62					62	61¼	1,105
do. pref													
Col., H V.& Tol.					27						27¼	27	220
do. pfd													
Col. & H. Coal	13¼		13	11	13½	11½	12¼	11			13½	12¼	3,160
do. pfd													
Cons. Coal													
Del. & Hud. C.	127½	126½	128⅛	128	129½	129	129				129½	129	2,230
Del., L. & West.	142¼	141¼	143½	142¼	144	143	144⅝	143⅝			145	143⅝	15.225
Hunt. & B.Top.													
do. pref													
Lake Erie&Wes			22				22⅛	21¾			22¼	22	1,000
do. pref.	77½		75¾		77¾		78						137
Lehigh C. & N.			53¼		53½	53¼	53¼	53					249
Lehigh Valley	48½	48¼	48½	48⅜	48½	47⅞	49⅜	48⅝					1,922
Mahoning Coal													
Maryland Coal							28						100
do. pref			65½				65½						35
Morris & Essex					149	148¾							
New Cent. Coal													
N. J. Central	115		116		117½	116½	117¾	117½			117¾	117	1,562
N. Y., L. & W.													
N. Y., L. E.& W	20¼	20⅛	20⅝	20⅜	21⅛	20⅜	21	20⅞			21¾	21⅜	10,345
do. pref							67½	67					
N.Y., Susq. & W	16¾		16½		16½						17		902
do. pref.					66½						68		805
N. & West.													
do. pref.							29½						29
Penn. R. R.	54⅛	54	54¼	54⅛	54⅜	53⅞	54⅜	54					5,544
Phil. & Readin	23⅝	23⅜	24¼	23¾	24¾	24	26	24¼			30	26¾	279,210
Tenn. C. & I.	21⅜	21	21⅜	19½	20	19	20⅛	19½			20¼	20	12,347
do. pref													
Wheel. & L. E													
do. pref.	55		55¼		57½	55½	58⅝						574

Total shares sold, 534,171.

INDUSTRIAL AND TRUST STOCKS.

Name of Stocks.	April 22.		April 24.		April 25.		April 26.		April 27.		April 28.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams Express					157	156							25
Am. Cotton Oil.	45	43¾	46	43⅞	45⅜	44⅛	45¼	45			47	44⅝	1,905
do. pref.	78		79	78½	80	78½	80⅛	79⅛			81¼	80¾	1,615
Am. Dist. Tel.					58⅞								100
Am. Express			118		118¼		118¼						41
Am. Sugar Ref.	101¼	100¼	102¾	101⅛	104	102⅝	103⅝	102⅞			104⅝	102⅛	134,949
do. pref	96½	96¼	97¼		98¼		98¾				[illegible]		670
Edison E.Ill.Co.	121	120¾	122				122						429
Edison Gen. El.	99⅛	97	99½	97¼	100½	98	100¾	99⅜			101	99⅛	27,242
Nat. Cord. Co.	59½	58⅝	60¾	59¾	60⅞	59¾	61½	60½			61¾	59¾	45,032
do. pref			104¼	103	103¾		103⅝	103			103¾		840
do. New													
Nat.Lead Co.	38	37	38¾	36¾	39½	37⅝	38⅞	38			39½	38	25,703
do. pref	80⅛		82¼	81	82		81⅞	81½					1,554
Nat.Linseed Oil.			30										100
So. Cotton Oil													
U. S. Express													
U S. Rubber			59¾	57	60	58¾	59½	58			60	58¾	7,290
do. pref.			94		94¼	93¾							200
Wells, Fargo Ex													
Western Union.	90¾	89½	90¾	89½	92¼	90½	91⅝	90⅞			92¼	89⅞	65,934

Total sales, 313,829.

CALIFORNIA.

San Francisco.

Names of Stocks.	Closing Quotations.					
	April 21.	April 22.	April 24.	April 25.	April 26.	April 27.
Alpha						
Alta		.20	.25	.15	.15	
Belcher		1.30	1.20	1.15	1.20	
Belle Isle	.10					
B. & Belch	1.60	1.80	1.70	1.65	1.60	
Bodie	.25	.31	.25	.25	.38	
Bulwer	.25	.30	.25	.25	.25	
Chollar	.75	.85	.75	.90	1.25	
Com'w'lth						
Con.C.&V.	2.55	2.90	2.75	2.60	2.40	
Con. Pac.						
Crown Pt.		1.15	.95	.90	1.00	
Del Monte						
E'rekaCon	1.50					
G'ld & C'y	.65	.85	.80	.75	.85	
Hale & N.	1.05	1.15	1.20	1.20	1.30	
M. White						
Mexican	1.50	1.85	1.75	1.75	1.80	
Mono	.25	.25	.25	.25	.30	
Mt. Diablo						
Navajo	.10					
Nev. Qu'n.			.05	.10		
N.B'leisle	.10					
N. Co'w'th						
Ophir	2.60	2.95	2.75	2.65		
Potosi		2.25	2.25	2.40	2.75	
Savage	1.20	1.20	1.20	1.30	2.90	
Sierra Nev	1.35	1.30	1.40	1.35	1.35	
Uni'n Con	1.15	1.30	1.25	1.25	1.40	
Utah		.10	.25	.20	.25	
Yel. Jack	.90	1.45	1.25	1.15	1.20	

COLORADO.

Aspen. April 22.

	Bid.	Asked
Argentum Juniata	$0.70	$0.71
Aspen Contact	1.25	1.50
Aspen Deep Mining	.10	.11
Best Friend	.08	.09
Bi-Metallic	.11	.12
Bushwacker	.14	.16
Delia S.	1.90	2.00
Gold Valley Placer	.15	.15
Little Annie	.08	.09
Mollie Gibson	7.00	7.45
Pontiac	.08½	.09
Smuggler	20 00	....
St. Joe & Mineral Farm	.10	.12
U. S. Paymaster	.20	.20

Colorado Springs. April 22.

	Bid.	Asked.
Anaconda Gold	.37	.38½
Calumet	.06½	.07
Cleopatra	.12½	.13¼
Fanny Rawlins	.32	.33
Gold & Globe	.07¾	.08
Gold King	.10½	.11
Isabella	.26	.27½
Jack Pot	.01	.01¼
Jeff Davis	...	.01½
Lemhi	1.22	1.25
Matoa	...	.05
Ophir	.10	.10½
Orphan Bell	...	.....
Pharmacist	.22	.23
Summit M. & M.	.21	.22½
Work	.06¾	.07
World	.07½	.07¾

Denver.

Prices and sales for the week ending April 22d:

	High.	Low.	Sales.
Anaconda	$0.39½	$0.36½	19.500
Amity	.01	.01	21,900
Bangkok-Cora Belle	.04¾	.04½	13,100
Brownlow	.03	.02¾	2,000
Calumet	.07	.06¾	7.200
Claudia J	.01	.01	13,300
Clay County	.01½	.01½	100
Diamond B	.02¼	01½	5,400
Free Coinage	.04½	.04½	500
Gettysburg	.03½	.03½	300
Ironclad	.04	.03¾	2,100
Justice	.02¼	.02¼	1,600
Puzzler	.05	.05	500
Tam O'Shanter	.02	.01¼	4,700
Work	.07¼	.06¾	31.700
World	.07½	.05	9,300

Total sales.......133,200

Rico. April 15.

Atlantic Cable Cons. M. Co	$0.25
Atlantic Cable guaranteed	.70
Enterprise Mining Co	3.25
Iron Dollar Silver Mines Co	.25
Southern Cons. Treasury Stock	.15
Uncle Ned Co	.35

MARYLAND.

Baltimore. April 26.

Company.	Bid.	Asked.
Balt. & N. C	....	.10
Conrad Hill	....	.10
Cons. Coal	....	.32
Diamond Tunnel	....	.30
George's Creek Coal.	1.05	1.12
Howard C. & C	1.10	....
Lake Chrome	....	.05
Silver Valley		.75@.55

MINNESOTA.

Duluth. April 21.

LISTED STOCKS.

	Par.	Bid.	Asked
Biwabik M. Iron Co	100	26.00	26.50
Cincinnati Iron Co	25	.98	1.00
Clark Iron Co	100	.40	.60
Cosmopolitan Iron Co	..	.15	....
Great Northern Min. Co.	100	8 00	9.00
Kanawha Iron Co	100	1.65	1.80
Keystone Iron Co	...	.10	.50
Lake Superior Iron Co	25	2.75	3.05
Lincoln Iron Co	..	.25	.50
Little Mesaba Iron Co	100	2.00	4.50
Minneapolis Iron Co	100	.12½	.30
Mountain Iron Co	100	50.00	85.00
Mesaba Moun. Iron Co.	100	18.00	18 50
Shaw Iron Co	100	3.80	4.00
Security Land & Exp. Co.	10	23.50	30.00
Washington Iron Co	100	.10	.75

UNLISTED STOCKS.

	Par.	Bid.	Asked
Adams Iron Co	..	4.50	....
Allegheny Iron Co	10	.12½	....
Aurora Iron Co	..	....	.50
Buckeye Iron Co	100	2.00	2.50
Camden Iron Co	..	....	.25
Chandler Iron Co	..	....	50.00
Chicago Iron Co	100	.60	1.00
Charleston Iron Co	100	1.10	1.25
Champion Iron Co	100	.25	.35
Cleveland Iron Co	..	.04	.06
Comstock Iron Co	100	.20	1.00
Columbia Iron Co	100	..	1.00
Dayton Iron Co	100	.15	....
Detroit Iron Co	25	.05	.07
Elmira Land & Iron Co		.20	.25
Great Western Mining Co.	100	3.90	4.25
Hall Iron Co	..	....	.50
Homestead Iron Co	25	.05	.07
Horton Mining Co	10	.06	.25
Imp. Iron Mt. Mining Co.	..	....	.50
Kentucky Iron Co	100	.25	....
Kakina Iron Co	25	....	2.00
Lackawanna Iron Co.	100	1.20	1.30
Macomber Mining Co	..	....	.50
McCaskill Mining Co	..	.03	.05
McKinley Iron Co	100	....	24.70
Mesaba Chief Iron Co	100	5.25	5.80
Mesaba Iron Co	..	.10	.25
Mesaba Mineral Co	..	....	.75
Minnesota Iron Co	..	65.00	....
Myrna Iron Co	10	....	.25
Northern Light Iron Co	100	.10	.20
New England Iron Co	100	....	2.00
Ohio Mining Co	100	9.75	11.00
Oneota Iron Co	100	.10	.25
Ophir, gold	..	1.12½	1.50
Pennsylvania I. & S. Co.	100	.15	.30
Pioneer	..	....	1.00
Putnam	..	....	.80
Rouchleau Iron Co	100	.75	.95
Republic Iron Co	25	.40	.60
Red Hematite Iron Co	100	....	.15
Standard Ore Co	25	.60	4.00
Stowell Iron Co	..	.01	.05
Towanda Iron Co	100	1.90	2.50
Zenith Iron Co	25	1.50	2.00

MISSOURI.

St. Louis. April 26.

Closing quotations:

	Bid.	Asked.
Adams	.80	....
American & Nettie, Colo.	.40	.45
Bi-Metallic, Mont	....	7.00
Elizabeth, Mont	.46¼	.50
Granite Mountain, Mont.	5.10	5.50
Hope	3.50	4.00
Leo	.05½	.07
Pat Murphy	.04½	.05
Small Hopes	.75	....

MONTANA.

Helena.

Prices for the week ending April 22:

	Bid.	Asked.
Bald Butte (Mont.)	$1.90	$2.25
Benton Group (Neihart), Mont.	.17½	.25
Combination(Phillipsb'g),Mont	1.10	1 25
Cumberland (Castle), Mont	.15	.25
Elizabeth (Phillipsb'g), Mont.	.47½	.52½
Florence (Neihart)	.17½	.22
Helena & Victor, Mont	.45½	.60
Iron Mountain(Missoula),Mont	.65	.80
Peorman (Cœur d'Alene),Idaho	.50	.75
Whitlach Union & MacIntyre.	.35	.50
Yellowstone	.10	.15

(Special report by Sam'l K. Davis.)

PENNSYLVANIA.

Philadelphia. April 27.

	Bid.	Asked.
Bloomington C. & C	....	....
Buck Mountain C	....	....
Cambria	70	71
Connellsville Gas Co	...	....
Excelsior B. & S	....	....
Locust Mt. C. & I	..	....
Penn. Salt	103½	104¼
Penn. Steel	50	80@120
Penn. Gas Coal	....	....
Royal Gas	....	....
Westmoreland C	65½	68

Pittsburg. April 26.

	Bid.	Asked.
Bridgewater Gas Co	27.00	40.00
Chartiers Val. Gas	10.00	10.63
Enterprise Mining Co	1.50	
Hidalgo Mining Co	5.50	6.50
La Noria Mining Co	.08	....
Luster Mining Co	9.00	9.50
Manufacturers' Gas	....	30.00
N. Y. & Clev. G. D	51.00	51.50
Pennsylvania Gas	9.50	10.00
People's N. G. & P. Co.	15.50	15.75
Philadelphia Co	21.13	21 25
South Side Gas	....	26.00
Tuna Oil	..	20.00
Wheeling Gas Co	23 25	24 00
W'house Air Brake Co	139.00	140.00

SOUTH DAKOTA.

Deadwood. Mar. 2.

	Bid.	Asked.
Deadwood Terra	$1 50	$1.75
Double Standard	.22	.25
Golden Reward	1.40	1.50
Hawkeye	.62	65
Iron Hill	.12½	.15
Isadora	.25	.30
Mutual	.01¼	.01½
Ruby Bell	.22	.25¾
Seg. Iron Hill	,01	.01
Tornado	.25	.30

Pipe Line Certificates.

Week Ending March 31.

	High.	Low.	Sales.
April 1	....		.....
" 3	68	67⅜	17,000
" 4	....	....	.....
" 5	....	....	.....
" 6	....	....	.....
" 7	....	....	.....

Total sales in barrels........ 17,000

FOREIGN QUOTATIONS.

London. April 15.

	Highest.	Lowest.
Alaska Treadwell	£2¼	£1¾
Amador, Cal	1s. 3d.	9d.
American Belle, Colo.	2s. 9d.	2s. 3d.
Can. Phosphate, Can.	£½	£¼
Colorado, Colo	£1 5-16	£1 3-16
De Lamar, Idaho	26s.	21s.
Dickens Custer, Idaho.	7½d.	4½d.
Eagle Hawk	1s. 9d.	1s. 3d.
Eberhardt, Nev	6d.	3d.
Elkhorn, Mont	23s. 6d.	22s. 6d.
Emma, Utah	1s. 1½d.	10½d.
Esmeralda, Nev	....	....
Flagstaff, Utah	10½s.	7½s.
Golden Leaf, Mont	1s.	6d.
Jay Hawk, Mont	10s. 3d.	9s.
La Luz, Mex	1s.	6d.
La Plata, Colo	10½d.	7½d.
Maid of Erin, Colo	10s.	7s. 6d.
Mammoth Gold, Ariz.	1s. 6d.	1s. 3d.
Montana, Mont	2s. 3d.	2s.
Mount McClellan	4s.	3s.
New Consolidated	....	....
New Guston, Colo	7s. 6d.	6s. 3d.
New Hoover Hill, N. C.	2s. 6d.	....
New Russell, N. C	....	....
New Viola, Idaho	....	....
Old Lout, Colo	3s. 6d.	2s. 6d.
Parker Gold, N. C	....	....
Pittsburg Cons., Nev.	2s. 6d.	1s. 6d.
Plumas Eureka, Cal.	12s.	10s.
Poorman, Idaho	8s. 6d.	8s.
Richmond Con., Nev.	10s.	7s. 6d.
Ruby, Nev	6d.	3d.
Sierra Buttes, Cal	8s.	6s.
" Plumas Eur., Cal.	£9-16	£7-16
Silver King	....	....
United Mexican, Mex.	3s.	2s.
Yankee Girl, Colo	2s. 3d.	1s. 9d.

Paris. April 6.

	Francs.
Belmez, Spain	630.00
Golden River, Cal	130.00
" " parts	30.00
Laurium, Greece	630.00
Lexington, Mont	83.75
" parts	2 00
Nickel, New Caledonia	730.00
Rio Tinto, Spain	398.75
" " oblig	517.00
" " " 2d	512.50
Tharsis, Spain	132 00
Vieille-Montagne, Belgium	510.50

ASSESSMENTS.

Company.	No.	D'l'nqt in office.	Day of sale.	Amt. per sh're.
Baltic Con. Cal.	..	May 5	....	.02
Belle Isle, Nev.	18	April 24	May 25	.10
Bullion, Nev	41	May 17	June 7	.25
Chollar, Nev	34	May 23	June 13	.25
Con. Imp'l, Nev.	35	April 26	May 17	.05
Con. St. Gothard, Cal	7	Mar. 17	May 6	.05
Con. Wyoming.	....	May 15	....	.10
Delhi, Cal	3	Apr. 12	May 3	.10
Goleta	2	April 22	May 16	.05
Gould & Curry, Nev	71	May 15	June 6	.25
Gray Eagle, Cal	32	May 10	May 30	.02
Greeley, Utah	...	April 5		.01
Independence	18	Feb. 27	Apr. 29	.05
Jack Rab'it, Cal	3	May 2	May 22	.05
Jackson, Nev	14	April 29	May 22	.20
Lady Washington, Nev.	9	May 23	June 13	.10
Mexican, Nev.	47	Apr. 16	May 11	.25
Navajo	25	April 24	May 22	. 0
No. Belle Isle, Nev.	23	May 23	June 21	.10
N.S.Cro'n, Mon.	..	April 12	May 3	.02
Occidental, Nev	12	April 17	May 11	.25
Ophir, Nev.	59	April 7	May 1	.50
Pine Hill, Cal.	2	April 27	May 24	.03
Savage, Nev	80	April 18	May 9	.50
Sierra Nevada.	101	April 9	May	.25
So. Eureka, Cal	3	May 10	June 5	.01
St. John Con., Cal	....	May 13	....	.05
Union Con.	47	April 16	May 11	.25
Utah Con., Nev.	17	April 26	May 15	.10
Yellow Jacket.	54	April 10	May 19	.25